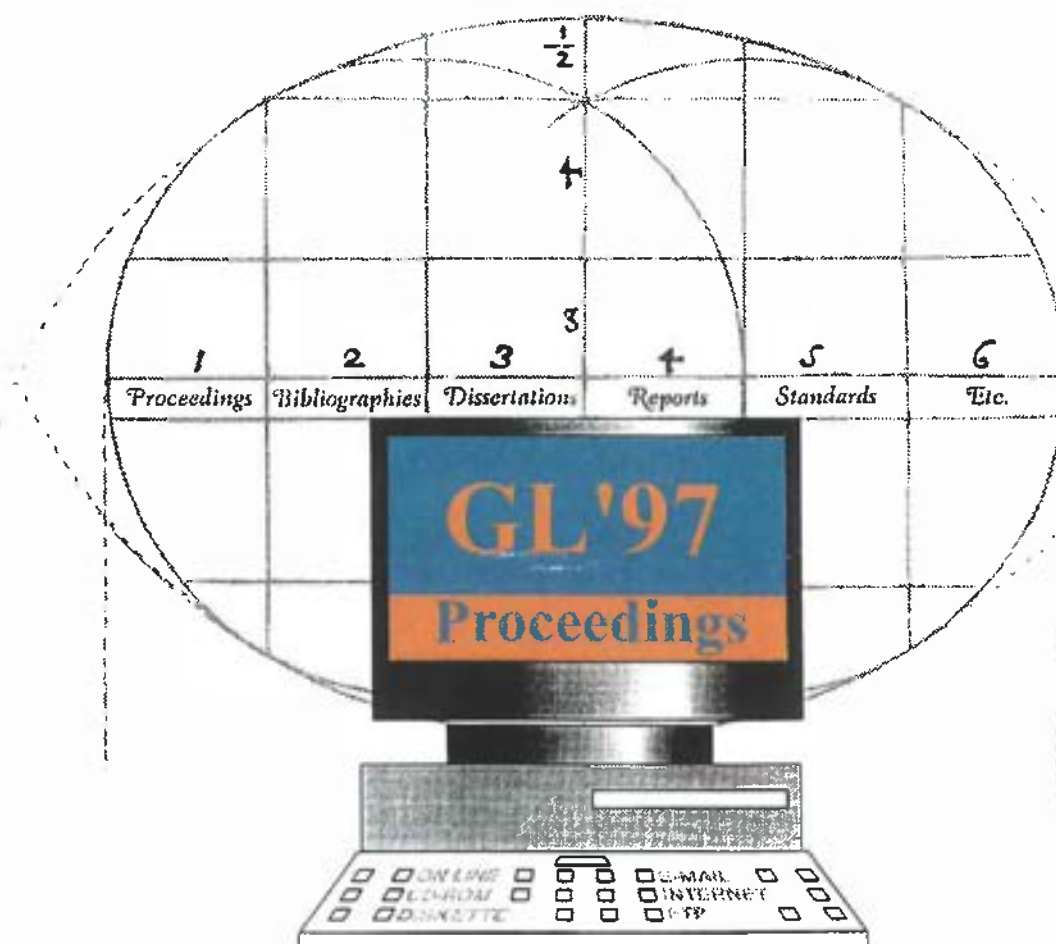


THIRD INTERNATIONAL CONFERENCE ON GREY LITERATURE

JEAN MONNET BUILDING, LUXEMBOURG
13-14 NOVEMBER 1997



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GL'97 Program and Conference Bureau

TransAtlantic GreyNet - Grey Literature Network Service
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Tel/Fax: 31-20-671.1818 Email: GreyNet@inter.nl.net

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FOREWORD

The Third International Conference on Grey Literature (GL'97) has succeeded in redefining the term 'grey literature' before the dawn of a new millennium. The revised definition has come to be referred to as The Luxembourg Convention on Grey Literature, after the city in which it was hosted. The definition of grey literature now reads *"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"*.

GL'97 was also successful in bringing participants and delegates together from some twenty-four countries worldwide. During this two-day conference, more than 30 papers and tutorials were presented. The results of the research and authorship that was invested in this scientific and technical event now lies within your hands.

On behalf of the Program and Organising Bureau, I encourage you to reflect upon these conference proceedings and to consider an intellectual contribution to the Fourth International Conference on Grey Literature, which will be held on October 4-5, 1999 in Washington D.C.

Last but not least, a sincere word of thanks to the Sponsors and Program Committee Organisations, who have lent their support for the success of this international conference series.

DR. DOMINIC J. FARACE
Program and Conference Director

AMSTERDAM, MARCH 1998

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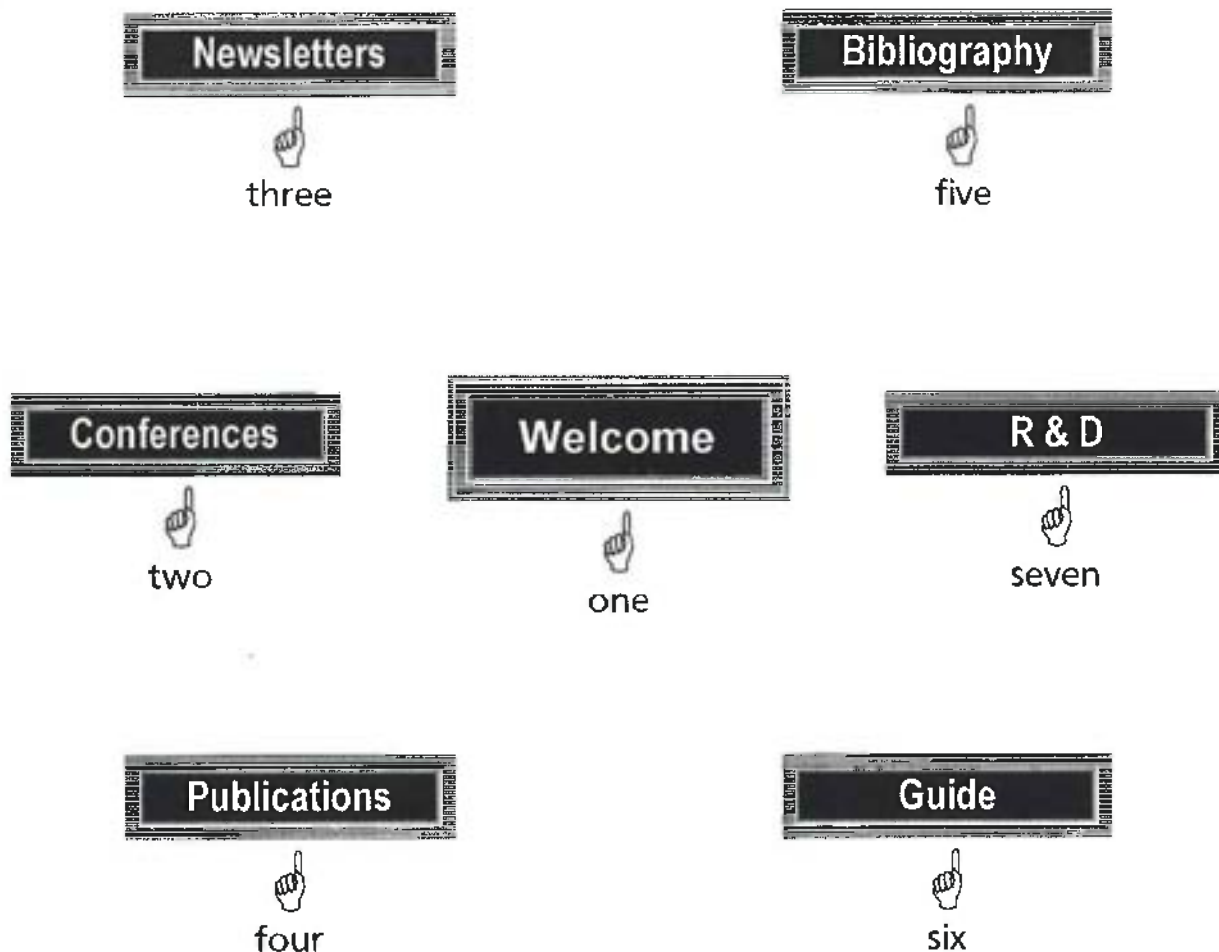
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Allocution de bienvenue
à l'occasion de la Conférence
3ème Conférence Internationale sur la Littérature Grise

Monsieur le Président,
....., Mesdames, Messieurs,

Au nom de Madame le Ministre de l'Education Nationale et de la Formation Professionnelle qui est malheureusement empêchée d'assister à cette cérémonie, j'ai l'honneur et le grand plaisir de vous souhaiter une chaleureuse bienvenue à l'occasion de votre conférence à Luxembourg.

Je tiens à féliciter et à remercier la Commission Européenne, le Center for Research Libraries, la European Association for Grey Literature Exploitation et la Japan Science et Technology Corporation pour l'organisation conjointe de cette conférence qui réunit aujourd'hui un nombre impressionnant de représentants des mondes académique et économique pour un échange de vues sur les perspectives en matière de conception et de transfert de l'information scientifique et technique, et plus particulièrement sur la contribution de la littérature grise au transfert de technologies et à l'innovation, sur les aspects liés à la gestion et à une meilleure exploitation de cette forme d'information, notamment au service de la formation.

Ensemble avec la biotechnologie, les technologies de l'information font certainement partie des technologies nouvelles susceptibles de changer rapidement le visage du monde. On s'attend à ce que la société de l'information pourra apporter une contribution décisive à la relance de la croissance économique et à l'apparition de nouvelles formes d'emplois. Des changements industriels et sociaux fondamentaux sont liés à l'avènement de la société de l'information: sa mise en place ouvre de multiples possibilités d'activités nouvelles aux citoyens et aux entreprises. En même temps, les technologies liées à la société de l'information pénètrent dans tous les domaines de notre vie quotidienne. Ainsi, leur impact économique et social dépasse largement le domaine des industries productrices d'équipements et de services de l'information et de la communication.

Nulle doute, le domaine de la publication et en particulier celui de la publication scientifique et technique subit actuellement de plein fouet les changements fondamentaux que génère l'avènement de la société de l'information ou plutôt de son précurseur qu'est Internet. Un chercheur du Konrad-Zuse-Zentrum für Informationstechnik à Berlin prédit que "les périodiques imprimés finiront par figurer comme simples accessoires de leurs analogues électroniques, et non pas l'inverse". Cette constatation est peut-être trop pointue, volontairement provocante même, il n'en est pas moins vrai qu'elle contient un grain de vérité. La préparation dès le départ par voie électronique des données et textes à la base de ces publications offre une multitude de nouvelles possibilités de présentation, transmission et traitement, sans parler des gains possibles en termes de rapidité et de flexibilité. Aujourd'hui la transmission électronique d'informations, encore essentiellement textuelles il est vrai, est devenue pratique de routine pour les sciences, la recherche et l'industrie.

Avec la diffusion plus large de nouveaux média tels que les CD-ROM et avec l'élargissement considérable des bandes passantes des réseaux électroniques de communication, permettant

de nouvelles formes de présentation multimédia, le domaine de la publication et de l'édition doit se préparer à un nouveau saut qualitatif. D'ici quelques années, la diffusion d'informations techniques et scientifiques (et pourquoi pas aussi de contenu administratif?) se fera sous forme multimédia au même titre que de nos jours l'échange en ligne d'informations textuelles. Nous sommes d'ores et déjà en présence des précurseurs à cette évolution; pour ne citer qu'un exemple: la maison d'édition Springer vient de mettre sur le marché deux nouveaux périodiques "Molecules" et "Journal of Molecular Modelling" uniquement disponibles sous forme électronique, intégrant texte, graphiques haute résolution, fichiers de données tridimensionnelles et séquences vidéo. Ces nouvelles formes de publication combinées à la technologie dite "hyperlink", permettant de créer des liens dynamiques entre des documents de nature, d'origine et de localisation physique différentes, ouvriront de tout nouveaux horizons pour l'édition et la documentation scientifique et technique. L'évolution tendra vers l'intégration d'une chaîne de gestion électronique de documents rendant plus rapide et plus efficace la circulation de l'information.

De toute évidence, ces bouleversements technologiques affecteront les circuits classiques de l'édition ainsi que toute autre forme d'édition. Je laisserai à d'autres, plus experts, le soin de s'exprimer sur ce qui pourrait être, dans de telles circonstances, l'avenir de la littérature grise et, a fortiori, sur l'avenir des circuits classiques de l'édition. Mais beaucoup porte effectivement à croire que l'introduction massive des nouvelles technologies de l'information nous mènera à une certaine "démocratisation" de la publication et de l'édition, c'est à dire à l'ouverture de circuits alternatifs et plus rapides d'information se substituant aux voies classiques d'édition.

Il va sans dire que ces nouvelles formes de publication offriront de nouvelles opportunités d'information pour tout un chacun, tout en créant d'un autre côté de nouveaux défis et problèmes. Pour certaines de ces sources d'information électroniques qui court-circuitent souvent les systèmes traditionnels d'évaluation, il s'avère notamment nécessaire que l'utilisateur s'assure lui-même de la qualité de l'information véhiculée.

Lors de votre conférence vous vous pencherez sur plusieurs de ces questions. J'en retiendrai ici un aspect, à savoir la contribution de la littérature grise au transfert de technologies et à l'innovation. Elle permettra notamment de mettre à la disposition des scientifiques et des industriels, bien avant leur publication dans les revues scientifiques, des informations essentielles pour leur activité de veille technologique et de prospective stratégique. Mais cette contribution peut aller loin au-delà de l'apport de l'information purement technique et scientifique, elle pourra comporter notamment une meilleure diffusion des informations relatives aux approches efficaces pour l'innovation dans l'économie et la société et aux meilleures méthodes de gestion et d'organisation. Par ailleurs, la diffusion d'informations visant l'évaluation comparative ("benchmarking") entre entreprises permettra à celles-ci de se positionner par rapport aux meilleures d'entre elles et constitue ainsi une manière efficace de diffuser les bonnes pratiques. Une autre composante importante du processus de l'innovation et du transfert de technologie est la connaissance du contexte socio-économique dans lequel ce processus est appelé à s'exécuter. Je vois là un domaine où la littérature grise d'origine administrative pourra être très utile.

Le système CORDIS, mis en oeuvre par la D.G. XIII de la Commission Européenne fournit un bel exemple d'utilisation de la littérature grise au service du transfert de technologies et de l'innovation. Il offre en effet toute une variété d'informations et de services ayant trait aux programmes et activités communautaires en matière de recherche et de développement technologique. Je suis confiant que le 5ème Programme-cadre communautaire en la matière, dont le Conseil des ministres de la Recherche vient de définir il y a quelques jours les orientations majeures, consolidera les acquis du système CORDIS et permettra d'élargir l'éventail des services offerts en réponse à la demande du monde économique.

L'étude des perspectives en matière de conception et de transfert de l'information scientifique et technique, l'évaluation de sa contribution possible au processus d'innovation et de transfert de technologies, les aspects liés à la gestion et à une meilleure exploitation de la littérature grise sont autant de questions qui sont plus que jamais d'actualité. Monsieur le Président, je suis certain que les conclusions de votre conférence contribueront utilement à la réflexion qui s'est engagée en la matière et qui est censée répondre aux défis que nous amène le changement technologique rapide.

Mesdames, Messieurs, permettez-moi de vous souhaiter un plein succès pour vos débats. Ils contribueront sans doute à enrichir les travaux que vous entreprenez au sein de vos laboratoires, instituts de recherche et administrations dans l'intérêt de l'avancement de la science au service de la société.

J'ose espérer par ailleurs que vous aurez l'occasion, malgré l'absence du soleil qui ne sera pas au rendez-vous, de profiter de votre séjour à Luxembourg pour apprécier l'architecture du vieux centre historique de la ville et de la forteresse qui constituent un cadre fort agréable invitant aussi bien à la réflexion et au travail qu'à la détente après les réunions. Je vous souhaite un agréable séjour au Grand-Duché de Luxembourg, en espérant que vous emporterez de notre pays un souvenir agréable qui vous incitera à y revenir à une prochaine occasion.

Je vous remercie de votre attention.

Pierre Decker

Conseiller de Gouvernement 1ère classe

Recherche Scientifique et Recherche Appliquée

Ministère de l'Éducation nationale et de la Formation professionnelle

Luxembourg

GREY LITERATURE AND INNOVATION

Joaquim de Witte
SENER/ EG-Liaison

INTRODUCTION

Ladies and gentlemen, it is my pleasure to address you at the Third International Conference on Grey Literature and to have the opportunity of sharing with you my view on the role of grey literature in innovation. I hope that, today and tomorrow, my talk will stimulate discussions on the utilisation of grey literature by industry, and small and medium sized enterprises in particular.

Let me first tell you something about the organisation to which I belong, EG-Liaison. We inform the industry and scientific community in the Netherlands on European research & technology programmes and support companies and institutes with the development of European research proposals and consortia. EG-Liaison is a department of SENER, the Dutch government agency for technology policy.

As main partner in the Dutch 'Innovation Relay Centre' (IRC The Netherlands), SENER also supports Small & Medium Sized Enterprises with initiating European partnerships aimed at product or market development. IRC The Netherlands belongs to a European network of 53 Innovation Relay Centres funded by the European Commission.

In the forthcoming 25 minutes I would like to survey the following subjects, trying to be concise and clear at the same time. Each subject could easily be the theme of a full lecture! First off all I would like to address the notions and scope of information and knowledge in an industrial context. Secondly I would like to spend some time on the current problems of knowledge and information in industry, caused by the complexity of our current business and technological environment. This will be followed by the main part of my lecture: the strategy initiated by our department to tackle these problems.

After resuming the basic assumptions underlying our strategy the two main elements of this strategy will be presented: the analysis of knowledge requirements and the concept of Special Interest Groups and Thematic Networks. Finally, I'll round off with summarising and hopefully stimulating conclusions.

INFORMATION AND KNOWLEDGE IN INDUSTRY

Allow me to start this section with a number of definitions and general observations.

Following Thieu Weggeman, recently appointed professor for innovation-management at the Technical University Eindhoven, I would like to define **knowledge** as a capability to perform specific tasks. Alternatively one could define knowledge as problem solving capability.

To solve problems we require **information**, data to which we assign a specific meaning, or, more practical, data which describe specific, observed, expected or invented situations or processes, with or without a judgement component.

Communication is the third pillar sustaining successful knowledge transfer. Often we face problems for which we lack in knowledge. We need to consult relevant experts and, hence, the capability to communicate with them, not only in written form but also verbally.

Innovation requires two broad categories of knowledge, scientific and practical. Modern technology is strongly based on scientific results but always goes together with the knowledge resulting from many years of practical experience. It is important to notice that the results of applying practical knowledge are not always documented in technical reports. Practical solutions often remain hidden in the heads of experts.

Mistakenly innovation is often only linked to technology, while in fact many innovations have more to do with management or marketing. Dany Jacobs of TNO, in his interesting book 'Het Kennisoffensief', 'The Knowledge Offensive' stresses the increasing importance of 'packaging' products, hence the need to be innovative on the marketing side.

In practice major innovations will require three types of knowledge: technological, management and marketing. Therefore we prefer to speak of 'knowledge transfer' instead of the more common notion 'technology transfer'.

From what I've said before, it stands to reason that innovation requires multiple knowledge sources: technology suppliers, clients, don't forget competitors!, engineering or management consultants, research institutes and universities.

Assessing the potential added value of other knowledge sources and supporting promising new communication links is one of the major challenges for organisations specialised in knowledge transfer.

PROBLEM SOLVING

It is fair to say - that by far the largest part of the information used to solve industrial problems consists of various kinds of grey literature. Think of technical manuals, product or company brochures, standardisation documents, patents, government documents concerning various forms of regulation and the increasing output of European research & technology programmes, disseminated without interference of publishers.]

In the context of innovation grey literature can play a dual role. On the one hand it may offer information which can be directly used to solve specific problems or to trigger new ideas, on the other hand it may serve as gateway to new relevant experts or 'knowledge sources'.

THE KNOWLEDGE PROBLEM

Access to various knowledge sources world wide is becoming an increasingly important production factor.

The combination of growing prosperity on the one hand and technological developments on the other hand has led to an increasing differentiation of products. More and more products have to be tailored to individual needs and tastes. Increased purchasing power has gradually changed a prevailing 'sellers market' in to a 'buyers market'.

Moreover, tastes are changing faster, being less constrained by rigid cultural doctrines.

Consequently the life cycle of products has decreased during the past decades and there is no sign that the required pace of innovation will slow down in the near future.

Until now I have focused on market pressures. Clearly increasing global competition amplifies the need to innovate. In addition, growing competition forces companies to reduce both 'costs' and 'time to market'.

These trends have a number of consequences for industry: First of all increasing pressure is exerted on engineering departments to develop new, as well as, qualitatively high standing products at a fast pace. Secondly increasing pressure to develop new markets and package products in new attractive ways.

Finally companies have to deal with increasing flexibility requirements and the problem of stocking goods which are soon obsolete. 'Just in time production' and 'Zero Inventory' have become very familiar notions in industry.

As long as technology "push" and "pull" are reinforcing each other, the pressure on organisations to "learn" will continue. Employees have to be trained continuously and companies have to track relevant technological and management developments as well as related knowledge sources in time.

However, in house training only is not sufficient. Faced with increasingly complex products and production processes, companies require multi-disciplinary teams tuned to specific product lines.

Considering the diversity of required knowledge and the shorter lifetime of products, increasing the number of specialised employees is not a very attractive solution. Instead we are witnessing a growing tendency towards product related 'industrial networks' of loosely coupled companies with complementary expertise. To include the right mix of word class expertise and regional impact, these 'virtual companies' will become increasingly transnational. Tracing the right international partners in time is becoming a growing concern.

THE INFORMATION PROBLEM

At the same time it is increasingly difficult to follow global developments due to the abundance of information generated and which is easily made available by new media. The elements causing the 'knowledge problem' are also largely responsible for the 'information problem'.

- rapid technological developments, increasing complexity and differentiation of products leading to a high production of new information
- increasing globalisation in business leading to increasing GL for marketing objectives;
- increasing international technological co-operation - the EC programmes for collaborative research and technological development have produced a huge quantity of grey literature;

In addition advanced information and communication technology has strongly contributed to the production and supply of grey literature. However, tapping relevant knowledge from these huge electronic resources is not always easy due to a lack of organisation, a poor presentation of stored information, and uncertainty about the reliability of knowledge sources.

Despite the increasing communication support offered by internet, the ease with which one gains access to grey literature concerned with technology or business development, still depends on the ability to communicate with authors, owners, or librarians. Good relations are often crucial to acquire specific documents in time.

The ability to communicate with authors or owners is even more important if one wants to turn information into applicable knowledge. It has been argued before that understanding and valuation of written information requires explanation by the authors or other experts.

Communication barriers often become bottlenecks for collaboration which looks promising on the basis of paper information.

In this respect European companies are disadvantaged compared to the industry in North America. This is due to the fact that, within comparable distances, differences in language and culture are significantly larger. This makes it much more difficult to discuss specific information with authors or owners. Effective utilisation of the increasing amount of grey paper will be strongly stimulated by evening out language and cultural barriers.

Due to their size, Small and Medium Sized Companies are disadvantaged compared to large companies. Large companies will always have more staff to monitor new technological or market developments. The disadvantage of lacking capacity particularly applies to many small "new technology based firms".

STRATEGIC ASSUMPTIONS

Solving the problems outlined above requires European agreements and collaboration aimed at the organisation and management of information flows and repositories. In addition a favourable communication climate should be created to cross cultural and language borders. We believe that these objectives can only be met if knowledge transfer is supported by European networks of intermediary organisations focused on specific industrial or technological areas.

First of all shared interest in and understanding of specific target groups shared by these organisations is essential for effective information management. Secondly common understanding of specific industrial target groups in different countries is essential to overcome the communication barriers mentioned above.

We are now putting these considerations into practice by the development of so-called Special Interest Groups (SIGs) and linking them to European 'Thematic Networks' aimed at knowledge transfer within specific technological area's or industrial sectors.

Before touching on these subjects, however, I would like to talk about the understanding of knowledge needs and the way we tackle this issue which is critical to the success of SIGs and Thematic Networks.

KNOWLEDGE REQUIREMENT ANALYSIS

Understanding the need for knowledge in the context of innovation is a requirement for efficient and effective knowledge transfer. This requires more than simply asking managers about knowledge needs.

For a number of reasons, innovation requirements have to be specified together with company characteristics such as the company's mission and strategy, organisation, culture, core competence's and business perspectives.

First of all, company characteristics are important to determine the relevance of specific knowledge. In the second place this information is needed to assess a companies capability to implement knowledge offered.

Finally, managers of smaller companies often have difficulties to express medium and long term innovation strategies and consequently the knowledge to sustain such strategies.

In such cases innovation perspectives have to be derived from the company characteristics.

We are currently developing a tool to map knowledge needs systematically in relation to innovation requirements and business characteristics. The tool will be used to analyse the needs of individual companies as well as the needs of industrial sectors. In the coming two years the tool will be used to scan at least 100 companies within the electro-metal sector in The Netherlands.

SPECIAL INTEREST GROUPS

[SIGs combine companies, R&D institutes, and universities with a common interest in specific technology or management methods, as well as, a common interest in knowledge transfer and collaboration] on a European scale.

Special Interest Groups are under development in the following areas: the electro-metal industry, biotechnology, transport, eco-design, multimedia and plastics and composite technology.

[SIGs] Typical Special Interest Group -activities include:

- the exchange of 'partner requests' via internet - the requests are aimed at collaborative projects ranging from research to business development;
- the acquisition, processing and exchange of information concerning relevant technological developments, market developments or government regulation.
- the promotion of national expertise by publishing "expertise profiles" on the SIG websites;
- In line with what has already been argued, SIGs will also have an important role in stimulating communication on a European level by organising workshops to discuss new developments, "brokerage events" to match potential European partners, and 'best practise site visits to companies and research institutes abroad.]

The activities of SIGs will be defined by the industrial members represented in SIG-steering committees.

Currently SIGs are supported by the European Commission as a Innovation Relay centre activity and by the Dutch government. The objective, however, is that within two years SIGs will be largely sustained by industry itself.

THEMATIC NETWORKS

~~Thematic Networks~~ link SIGs to intermediary organisations focused on knowledge transfer within corresponding areas of interest in different European countries. In the context of these thematic networks agreement is reached on

- information management;
- communication procedures;
- the development of common information repositories, and joint events to stimulate personal contacts between potential partners;
- the development of procedures to assure the quality of disseminated information.

Most of these organisations are Innovation Relay Centres funded by the European Commission. In some cases we will collaborate with other organisations representing specific industrial sectors, such as the Comité Richelieu in France which represents around 200 French SME's specialised in advanced technology.

Also extensions outside Europe are possible. At present, for instance, we are discussing collaboration with the Canadian Department of Trade and Industries.

CONCLUSIONS

I hope to have demonstrated that exploiting the international flow of grey literature for innovation purposes is crucial for industry and that offering adequate support is a major challenge for intermediary organisations. In this respect special attention should be paid to SMEs.

Meeting this challenge requires understanding of industrial needs and agreement among organisations with common interests concerning information management on a European scale. In addition, verbal communication between actors sharing common interests should be stimulated since many come from different professional and cultural backgrounds. These considerations fit in the combined development of Knowledge Requirement Analysis and Special Interests Groups linked to international Thematic Networks.

We hope that the SIG concept will be followed in other countries and that the Thematic networks will evolve into true SIG networks.

Finally we thank the European Commission for supporting our initiative as part of the Innovation Programme.

The expanding horizon of Grey Literature

PROF. JOHN MACKENZIE OWEN

University of Amsterdam

Definition

Grey literature is a term that describes information products which are created and distributed in order to disseminate knowledge (ideas, facts, opinions) rather than to sell for a profit. In practice, therefore, grey literature can also be defined as information which is not marketed and distributed by commercial publishing organisations. The term 'grey' stems from the fact that such information is not publicised and not available through the traditional channels of publishers and booksellers. Grey does not imply any qualification, it is merely a characterisation of the distribution mode. In fact, a large proportion of grey literature is distributed in both modes: 'grey' in the form of pre-prints, 'white' in the form of a published article. The quality is often identical, the main difference being that 'white' literature has a quality stamp provided by the publisher and its embedded peer review process.

In this paper I shall focus on the distinction between 'grey' and 'white' literature as a difference in distribution modes. I shall argue that both publisher strategies and developments in the area of digitalisation and networking will result in an increasingly marginal role for the publishing industry and in a future information environment in which 'grey' will be the predominant distribution mode.

Traditional grey literature

Grey literature has become a specialised branch of the information profession due to a number of characteristics which distinguish it from published literature:

- ◆ Traditional grey literature is concerned with physical information objects: information items in paper form, produced and distributed by the individuals or organisations that create them.
- ◆ The producers of grey literature do not belong to the formal 'information industry' such as publishing houses. They are organisations (or individuals working for organisations) in other sectors such as industry, universities and research institutes, and government organisations.
- ◆ Within the information industry, which has as its main objective to create and distribute information products, there exists an infrastructure for distribution. For organisations which create grey literature, creating and distributing information products is not the core business. For grey literature there exists no formal organisational structure for distribution.
- ◆ The lack of a well-defined distribution infrastructure requires a pro-active acquisition policy from intermediary organisations such as libraries.
- ◆ For the same reason, there is a need for specialised bibliographic instruments to facilitate the identification and retrieval of grey literature

Over the years, therefore, the field of grey literature has evolved into a universe of its own, with specific work methods, vocabulary, systems and activities such as this international conference.

The future of publishing

Grey literature always has to be defined in contrast with published literature. In looking at the future of grey literature, it is therefore necessary to analyse how the publishing industry will develop. Such an analysis points to a number of severe problems, especially in the area of scientific publishing:

- ◆ The primary producers of information - the authors and their parent organisations - have little or no control over the distribution process. Recent mergers and acquisitions in the publishing industry are giving publishers even more control over the process of scientific communication - a process they already monopolise.
- ◆ The price of published information has been increasing at a much higher rate than the rate of inflation, has been doing so for many years, and will apparently continue to do so. The main reason why publishers are able to set high price levels lies in the monopolistic power they obtain by requiring authors (and their parent organisations) to award them exclusive ownership of copyrights.
- ◆ The cost of published information is perceived as excessive by most intermediary organisations, especially in view of limited budgets.
- ◆ The publishing industry is extremely slow in adopting new technologies which might reduce cost, increase accessibility and speed up the process of production and delivery. In an increasingly digital networked world, the level and results of IT-use by publishers are nothing but disappointing and anachronistic.
- ◆ The deployment of information technology by publishers so far appears to restrict access rather than enhancing it. The free access to information in libraries is being substituted by restricted access to computerised systems, requiring complicated navigation, access controls (such as identification), and payment for use.
- ◆ Publishers have lobbied successfully for restrictive copyright legislation and licensing schemes which prevent intermediaries such as libraries from developing new services (such as digital distribution, long-term archiving, uniform access systems, resource sharing) and from maximising economic benefits from IT-innovations to the end-user. The use of IT should increase cost-efficiency and enhance availability and ease of access. Publishers do not seem to regard such goals as strategic objectives.
- ◆ It is widely recognised that there will be major problems with the archiving and long-term availability of digital information products. Especially in the scientific world, information is the memory store from which scientific developments arise. However, publishers have little interest in the long-term availability of their products, and therefore do not take responsibility for these issues.

The general perception amongst intermediaries and end-users is that the traditional balance between quality, revenue (to the publisher) and value (to the user) no longer exists. Creators and intermediaries are now starting to resist the business strategies of publishers, and are beginning to think about new distribution models in which there is no, or at least less need for large, monopolistic, highly profit-oriented publishers.

It is being recognised that there is a need to re-engineer the scientific communication process. The traditional concept of an information chain, consisting of authors, publishers, intermediaries and users, is no longer valid. Creators and users of information will have to become more responsible for managing the communication process. Where outsourcing makes sense (e.g. to publishers), it will have to be done in a way which leaves the scientific community in control. Digitisation and networking provide many opportunities for developing new communication modes. It is unlikely that publishers will be involved in these. The current strategy of publishers will probably lead to an increasingly marginal role of the commercial publishing industry.

The future of information distribution

Publishers' commercial strategies are not the only reason for a shift towards new distribution models. A number of other developments point in this direction, most of them related in one way or another to digitisation and networking:

- ♦ The idea of an information chain through which publications are shifted from author to user is now giving way to the idea of a global network infrastructure or 'information space' consisting of an enormous amount of individual digital information objects embedded in a logical and intellectual structure.
- ♦ Since this information space is available to anybody connected to it (which in practice means to everybody), there is no need for a formal information chain and for the traditional roles of publishers or even intermediaries. For the end user, the difference between grey literature and published literature is to a large extent the difference between open access and restricted access.
- ♦ Search engines (based on post-coordination) are taking on the role of traditional bibliographic databases (based on pre-coordination): collecting a set of relevant and related information objects on the fly is favoured above the intellectual activity of creating collations in anticipation of expected need. This has implications for both publishers (e.g. grouping items under journal titles) and intermediaries (e.g. collection development and creating catalogues and bibliographies).
- ♦ The organisation of information at the source level (e.g. authors and authoring organisations) is improving. Examples are the use of embedded metadata in source documents, the distribution function performed by pre-print archives, and non-commercial 'electronic journal' type websites developed by universities, libraries and other organisations.
- ♦ The traditional debate on end-users versus intermediaries' has already been decided in favour of the end-user. Most end-users have both the skills and the technology to solve information problems for which they used to require professional support.

What this means is that digitisation and networking provide authors and end-users with a mechanism for distributing and acquiring information without need for the professional institutions in the information chain. This inevitably leads to an information world in which 'grey' literature is the predominant type of information. If the traditional institutions, such as publishers and intermediaries wish to survive, they will have to adopt new roles. These roles can no longer be defined in terms of traditional functions such as packaging and distribution, or storage and retrieval. They will have to be found by offering solutions to problems which are inherent in the new information world.

One example of this is a role for publishers in quality control. There are many problems in this area, due to the fact that the traditional peer review process is embedded in traditional publishing procedures. There is, as yet, no viable equivalent for the digital world. This is an area where publishers could become involved by developing solutions for peer review of digital objects which are useful and logical in a networked environment, e.g. involving rating systems and electronic refereeing. It is desirable that such roles are performed on the basis of a service-based philosophy: publishers should be paid (by authors and their organisations) for the services (such as quality control) they provide.

The role of the library sector

In this paper I have argued that both publishers' strategies and IT-developments will reduce the importance of the traditional information distribution chain significantly, and of the traditional institutional parties in the information chain such as publishers and information intermediaries. Libraries are, as information intermediaries, an important component of the information chain. I would now like to say a few words on their future role.

The most important consequence of the emerging role of digital information products and networked distribution is that libraries will have to move from functioning as acquisition-oriented memory organisations towards service organisations supporting and facilitating access to information on the network. In addition, there are many opportunities to move towards the production and distribution side of the information cycle.

Of the many things libraries can and should do under these circumstances, I find the following the most important and challenging:

- ♦ Creation and management of networked document servers, acting as nodes on the network where information - either from the parent organisation or in specific subject domains - is made available to the global network community. It is likely that most of this information will be of the 'grey' type.
- ♦ Creating and maintaining sophisticated search and access mechanisms which help users to navigate through the networked information space. This should result in integrated resource-finding tools which can handle licensed, pay-per-view and non-licensed information resources, as a substitute for traditional catalogues and bibliographic databases. Activities in this area should also include mechanisms for spanning organisational and geographic boundaries, resulting in virtual networked digital libraries - available at the user's desktop - giving integrated access to heterogeneous information objects stored on different network nodes.
- ♦ Archiving for long-term preservation and access. An important responsibility of the library world will be to ensure that digital information is preserved and remains accessible over the centuries. This is a formidable task, especially in view of the problems created by rapidly developing technology and its related standards. The technology and standards on which current information products are based will no longer be available in ten or twenty years from now, and these products will only be kept available on the network by their creators or publishers for an even shorter period. If the library world does not solve this problem, nobody will, and all information - grey and white - will disappear from the memory of mankind.

European information policy

The European Union has contributed greatly towards the development of the information sector through its R&D programmes. However, these programmes are aimed at existing, traditional economic sectors and are, in this case, highly biased towards the traditional information industry. The information industry in Europe benefits not only from R&D programmes, but also from legal protection. This is due to a limited interpretation of the objective of many EU activities, which is to increase job creation in the information industry rather than to increase the added value of information to the economy and society at large. In short: the financial and competitive position of a relatively small economic sector (the information industry) benefits from European R&D subsidies and legislative activities, but this does not by definition lead to a better and wealthier information society. In fact, support to the information industry in practice leads to severe restrictions on the development of the information society and knowledge economy in Europe.

I have argued that at least the publishing sector will in future become a less important player in the information field: their strategies are unacceptable to authors and users, the role of 'grey' literature is becoming far more important, information production and distribution is becoming embedded in other industries. There is therefore a need for change in the European information policy.

European information policy should focus on the role of information and information distribution in society and its added value to the European economy and for the competitive position of both industry and the academic sector. Focusing on the relatively small and

diminishing role of the formal information industry and equating the information sector with the publishing industry is a strategic mistake in view of the way the information society is developing.

Subsidising the publishing industry (through R&D programmes) and strengthening their legal position (through legislation in areas such as copyright and database protection) is not helpful in the long term. Instead, support should be given to creators and users of information, and to developing and sustaining a European information environment capable of competing with the rest of the world.

Conclusions

In this paper I have argued that a number of developments is changing the information scene on an unprecedented scale. One consequence of these developments is that an increasing proportion of information available to users on digital networks will have the characteristics of what we traditionally have called 'grey' information. The difference between the 'grey' and 'white' sectors is described in Table 1:

	Grey	White
Relative volume	Increasing	Decreasing
Speed of production and delivery	High	Low
Cost of information	Low, decreasing	High, increasing
Accessibility	Global, unrestricted	Limited, restricted
Quality control	To be provided by innovative technologies	Organised through traditional peer review process
Long-term archiving	Problematic due to volume and technological ageing	Problematic due to legal restrictions and technological ageing
Role of libraries	Loss of traditional roles Opportunities for new services	Limited by legal restrictions
Role of publishers	Marginal, limited to support functions	Diminishing

Finally, let me summarise the points I have raised:

- ♦ The traditional information chain is being substituted by a networked information space. This will have serious consequences for information chain based institutions such as publishers and libraries.
- ♦ The emerging networked information space will allow creators of information to distribute their information products with little or no support from publishers. Most information available to users will therefore be 'grey' rather than 'white'.
- ♦ The pricing policies, business strategies and IT-deployment of publishers, together with the erosion of the information chain indicate that the publishing industry is entering the final stages of its life cycle, resulting in a marginalisation of the role of publishers within the scientific communication process.
- ♦ Libraries, as intermediary organisations, will lose many of their traditional roles. But the problems inherent in digital networked distribution provide many opportunities for taking on new roles.
- ♦ The European Union should recognise the fact that the traditional information industry is no longer instrumental in developing the information space and that the information society and economies of Europe require new policies for R&D and legislation in the field of information.

The Shape of Things to Come?

Self-organizing grey literature databases for the internet

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Abstract

The Shape of Things to Come?

Self-organizing grey literature databases for the internet

Offering a database in the internet should not mean putting old wine in new bottles (i.e. just using another technical medium without making any substantial changes), but taking the chances for some interesting qualitative improvements notably concerning the frequently discussed topics of document delivery, direct ordering, printing on demand, communication between authors and readers and so on.

Under the conditions of the internet there is no longer a need for providing full text databases for warranting the accessibility of documents. The same effect - and even more - can be reached by a completely different system skilfully making use of the conditions of the internet resp. the world wide web.

In this paper, I shall outline

- a sociotechnical system - specially for grey literature - consisting of a central database and a number of peripheral servers providing for input as well as for document supply (output)*
- the structural changes databases have to undergo to meet the demands of the internet resp. of such a system; and*
- discuss the social presuppositions for making such a system really work.*

1. Introduction: Communication, the essence of science

Besides empirical methods, communication is the most important prerequisite of science. William D. Garvey called his fundamental book about the scientific community "*Communication - the essence of science*", thus underlining the tremendous importance of communication. Science necessarily needs communication, not only in order to exchange knowledge and new findings, but also for discussing new results and ideas. The reason is that it is by no means the application of methods that produces scientific knowledge. Even the best research work can only produce data, results or - in terms of communication - *proposals*, not their *acceptance* or the *decision* about data, results or proposals. It is the scientific discourse, i.e. the communicative process of discussion, of mutual criticism, of conjecture and refutation or acceptance, that produces scientific *knowledge*. Thus, it is the communication of the scientific community that decides about scientific truth or, in other words, about facts and non-facts.

This communication can be either formal or informal. The formal communication system of science is characterized by controlled access to publication media of any kind: In any case, a paper has to pass a review process deciding on the acceptance or refutation, i.e. the publication in a journal or by a publisher. In order to save time as well as to evade this control, there is an additional informal communication system comprising face-to-face contacts at conferences, symposia and the like as well as phone calls, letters, telefaxes and so on as well as unpublished research reports of any kind, so-called grey literature, which provides the most direct, uncensored and fastest information and communication about new findings.

So if science shall work appropriately, it is essential that scientists know about new findings and can participate in the worldwide discourse of their special scientific community. They need information and must be able to engage in the process of communication and evaluation of information, and in return they must be able to make their own contribution to the scientific process. So they have to know where they can get the information they want or need or which could, at least, be of some interest for them; they must find the appropriate information channels and sources, spot the communication circles, locate infrastructure institutes etc.

As far as literature - published and unpublished - is concerned, the traditional solution of this problem is the **bibliography** (which for reasons we all know is always late). The more modern solution of the same problem is the **database** partly sharing the same disadvantage although balancing that by considerable advantages on the other side, such as large overview over immense numbers of publications, systematic and precise search within seconds and so on. (Despite their indexing quality, however, databases are sometimes very fast. The database SOLIS, e.g., covering the social scientific literature of the German speaking countries delivers the description of journal articles to the host only six to eight weeks after the journal issue was released, although SOLIS guarantees a high standard description with an abstract, controlled terms, methodological descriptors, title translation into English and others.)

2. To know or to have: The problem of document delivery

But speed is not everything. Even the fastest database cannot solve the problem of *document delivery*. You do not only want to *know* about a publication or a grey research report, but in case it seems to be interesting or relevant, you also want to *have* it.

And this is the hour of adventure, frustration and lapse of time

Of course, the hour of frustration is not really just an hour, but may take weeks or even months. In many cases, you receive your requested copy at a time when you do not need it anymore or when you have even forgotten why you have ever been interested in that special title. Must have been years I have been dealing with that question... And particularly when grey literature is concerned, the result may be totally negative: *"sorry, no copies available"/ "author left institute meanwhile"/ no response at all* or the like. This may happen in case you try it by library or by personal contact with the author or his institute.

3. An attempt for solution: the full text database

An attempt to solve the problem of document delivery is the **full text database** storing the complete text of a publication or a paper. This is a really interesting solution as long as three conditions are fulfilled:

- Firstly, users must have an easy and unproblematic **access** to the database.
- Secondly, the papers included in this database should **not be too long**.
- Thirdly, the database has not necessarily to be **complete** but should at least contain a considerable part of publications or reports of a defined area, be it a scientific discipline, a country, a type of publications or whatever.

The **first condition** - direct access - I think is no problem at all in the times of online databases and internet. If we think of grey literature in particular, we should mention the European grey literature database SIGLE, which is online available at the host STN International.

The **second condition** - not too comprehensive texts -, however, seems to be somewhat problematic in certain areas. This may work in the Sciences where primary publications use to be journal articles comprising two, three or five pages or so. In the Humanities or Social Sciences, however, many primary publications are books, and when I say „books“ I mean „books“, not „booklets“. That means that 300, 400, 500, 700 or even more pages are nothing extraordinary. The last two books I had to do with as editor or co-editor had 616 and 405 pages. And my research report on grey literature in the Social Sciences appeared in three volumes: the text comprised 342 pages, the second volume presented 245 tables on 251 pages, and the third volume with the description of all fields of the project database, all questionnaires and all materials used in the course of the research project, had another 120 pages - all together 713 pages. As I told you, this is nothing extraordinary in this scientific area. I should add, that in German sociology between one quarter and one third of all publications are books. So I think it would be somewhat unrealistic to create a server containing most original resp. primary literature of the Humanities and Social Sciences and other disciplines with a comparable print output. Time and royalties for complete book downloads, I think, would be tremendous. And beyond that, there were no reasonable relation between expenditure for storage on one side and usage on the other.

The **third condition** finally - [relative] completeness according to a generally accepted definition - could be even more problematic since there is a lot of commercial interests involved. The publishers put a lot of manpower and money into a publication and its marketing and so, I think, they shall not be ready to renounce to the benefits. So we could end up with a situation where there is not a gigantic "mega-server" but each publisher has his own server with his own publications thus cash his own royalties. But this is not the kind

of completeness a scientist wants and needs. At first, the happy user needs a meta-database giving references to all the special servers of hundreds or even thousands of publishers. And then the user had to go online to each and every of these servers and repeat his search (of course with a lot of different retrieval languages and database systems) until he finds a publisher offering the material he needs. But even in this lucky case he cannot be sure to have found *all* relevant information, which, however, is required by scientific rules and ethics.

If someone should ask for my personal expectations, I would say that it is much easier, much more reasonable and much less frustrating to read a bibliography, than complete an order form, give it to a library and wait for what will happen.

4. And what about the internet?

Maybe someone would say that under the conditions of the **internet** it could only be a question of time until the last (scientific) publisher has surrendered and given his last copyright to the almighty internet. But I think this will not happen.

The reason is not only that there are strong commercial interests involved and that a lot of people have been earning their living in this sector.

The more important argument, I think, is that *formal publication* - i.e. publication in a journal or edition, in an esteemed one if possible - is not just a necessity for scientists but the perhaps most important *source of reputation*. That is why grey literature is not and cannot be a rival for formal publication but just an adjunct fulfilling certain important (scientific, cognitive) functions but not the most important of them all which is a personal, a subjective function: that of giving reputation.

Giving up the difficulties, the barriers and restrictions of access would mean giving up the possibly most important element of the scientific reward system.

Nevertheless, I think that in one specific area of scientific literature there could be a solution: in the *area of grey literature*. In a certain sense, my proposal is a combination of the three components just mentioned before:

- the traditional database
- the full text database and
- the internet.

The interesting thing with this idea, I think, is the specific way of combining them.

5. Traditional databases and databases in the internet

Literature databases usually consist of two or three logical parts:

Table 1: Bibliographic entry in database SOLIS**SOLIS COPYRIGHT 1997 Informationszentrum Sozialwissenschaften*****Logical part 1: Bibliographical data***

TITLE The Public Sector: challenge for coordination and learning.
AUTHOR Herausgeber: Kaufmann, Franz-Xaver (Universitaet Bielefeld Institut fuer Bevoelkerungsforschung und Sozialpolitik -IBS- <Postfach 100131, D-33501 Bielefeld>)
SOURCE Berlin: de Gruyter. 1991. XI, 553 S. (zahlr. Abb. u. Tab.)
SERIES TITLE: De Gruyter studies in organization, Bd. 31
ISBN: 3-11-012380-0

Logical part 2: Descriptive elements

DOCUMENT TYPE monograph; (Sammelwerk)
COUNTRY Germany, federal republic
LANGUAGE English
ABSTRACT Vorgelegt werden Beitræge aus dem Zentrum fuer interdisziplinære Forschung an der Universitaet Bielefeld zu Problemen der oeffentlichen Verwaltung. In einem ersten Teil werden zunaechst Defizite politikwissenschaftlicher und wirtschaftswissenschaftlicher Forschungsansaetze in bezug auf den oeffentlichen Sektor identifiziert. Es schliessen sich Ueberlegungen zu begrifflichen und verfassungstheoretischen Aspekten des oeffentlichen Sektors an, die Fragen des modernen Staates, des Foederalismus und des Wohlfahrtsstaates eroertern. Vor diesem Hintergrund werden Anleitung, Kontrolle und Evaluation als Bedingungen politischen Lernens diskutiert. In einem abschliessenden Teil werden institutionalisierte Formen von Koordination verglichen (Markt, Hierarchie, Solidaritaet) sowie Netzwerke und Beziehungen zwischen Organisationen analysiert. (ICE)

Logical part 3: Descriptors

CONTROLLED TERMS: public sector; public administration; politics; political action; administrative action; evaluation; implementation; political administrative system
CLASSIFICATION CODE 10207* (Sociology of Organisation)
METHODS descriptive; theory application

- Part one comprises the *bibliographical data* which are necessary for the identification of a publication or report. With books, these are e.g. author or editor, title and sub-title, publisher and publication year, number of pages and ISBN; with journal articles these could be journal title and volume, issue and pages etc.
- In many cases, there are additional *descriptive elements* such as abstracts, methodological information etc. allowing a better estimation of the paper's possible relevance for the user. This is part two.
- And part three eventually contains *descriptors* (or *search arguments*) allowing a systematic retrieval of pertinent entries even in very comprehensive databases containing hundreds of thousands or even millions of entries.

(Of course, the different parts can fulfill different functions at the same time. The CONTROLLED TERMS; for instance are primarily used as search arguments, but they help with the estimation of relevance as well. And the descriptive text of an abstract can also be used for a FREE TEXT search.)

The internet now offers a possibility which, under certain conditions and with certain restrictions, could solve a part of our *problem of instant document delivery*. There is not even a necessity for re-eventing the database or for making far-reaching changes. Provided the database is connected with the internet at all, we just have to make a small addition.

6. The slightly different database I: technical aspects

Let me begin with some general remarks about the internet. Seen by a technical point of view, the internet is nothing but a lot of wires and telephone cables linked together thus forming a world wide web so that it is possible to reach any computer (or „server“) in the world from any other computer (server) provided both have an access to this net.

What is the decisive advantage of the net? I shall try to explain this by a simple example. For my institute, I am building up an international calendar of events¹ indicating date, location, and title of conferences, symposia and the like. Beyond this, I present some more information, for instance on the conference's content, the organizing institution and so on. Most important of all, however, is the indication of a *contact person* or institution - of course with full address (if available), phone and fax number, e-mail address and in a lot of cases the so-called URL (for *uniform resource locator*) which is the internet address of a computer or a special file on a computer. The printed version of the calendar of events looks like this:

¹ For those who are interested: <http://www.bonn.iz-soz.de/> (=homepage) or more precisely: <http://www.bonn.iz-soz.de/events/international/index.htm> (=calendar of events).

Table 2: Entry in the GESIS calendar of events

13.11.-14.11.1997

Luxemburg (Luxemburg)

**“Perspectives on the Design and Transfer of Scientific and Technical Information”:
Third International Conference on Grey Literature**

Tagungsort/Location: European Centre, Jean Monnet Building

Deadline: English abstract not to exceed 250 words: 01. April 1997 (by e-mail or on a disc in WordPerfect); include printed copy.

Kontakt/Contact:

Dominic Farace

TransAtlantic/Greynet

Koninginneweg 201

NL-1075 CR Amsterdam

Tel./Fax: +31-(0)20-671.1818

GreyNet@inter.nl.net

Further information:

<http://www.konbib.nl/infolev/greynet/home.html>

<gopher://gopher.konbib.nl:70/00/greynet/conferences-seminars/conference97>

Verification date: 20.12.1996 - *Source:* Homepage

May I draw your attention to a special point: the URL, i.e. the internet address:

Table 2a: Internet addresses in GESIS calendar of events

GreyNet@inter.nl.net

Further information:

<http://www.konbib.nl/infolev/greynet/home.html>

<gopher://gopher.konbib.nl:70/00/greynet/conferences-seminars/conference97>

What is the difference between the the *printed version* and the electronic *internet version*? How would this (printed) address look in the internet version of the calendar? Well, it would look exactly the same. The difference is not in the *shape* but in the *function*. (This is not quite correct. Actually, there is a difference: Blue colour - which unfortunately cannot be reproduced here - and underlining indicate a HTML-formatting. "HTML" stands for *hypertext markup language* which is the tool for marking addresses or texts for internet use. It is this HTML-marking that makes a written address a clickable *hyperlink*.)

To explain this in brief: Let us suppose you have some basic information about our conference on grey literature and are interested in learning more about its topics, about the schedule and so on or you are even interested in participating or offering a paper yourself. If

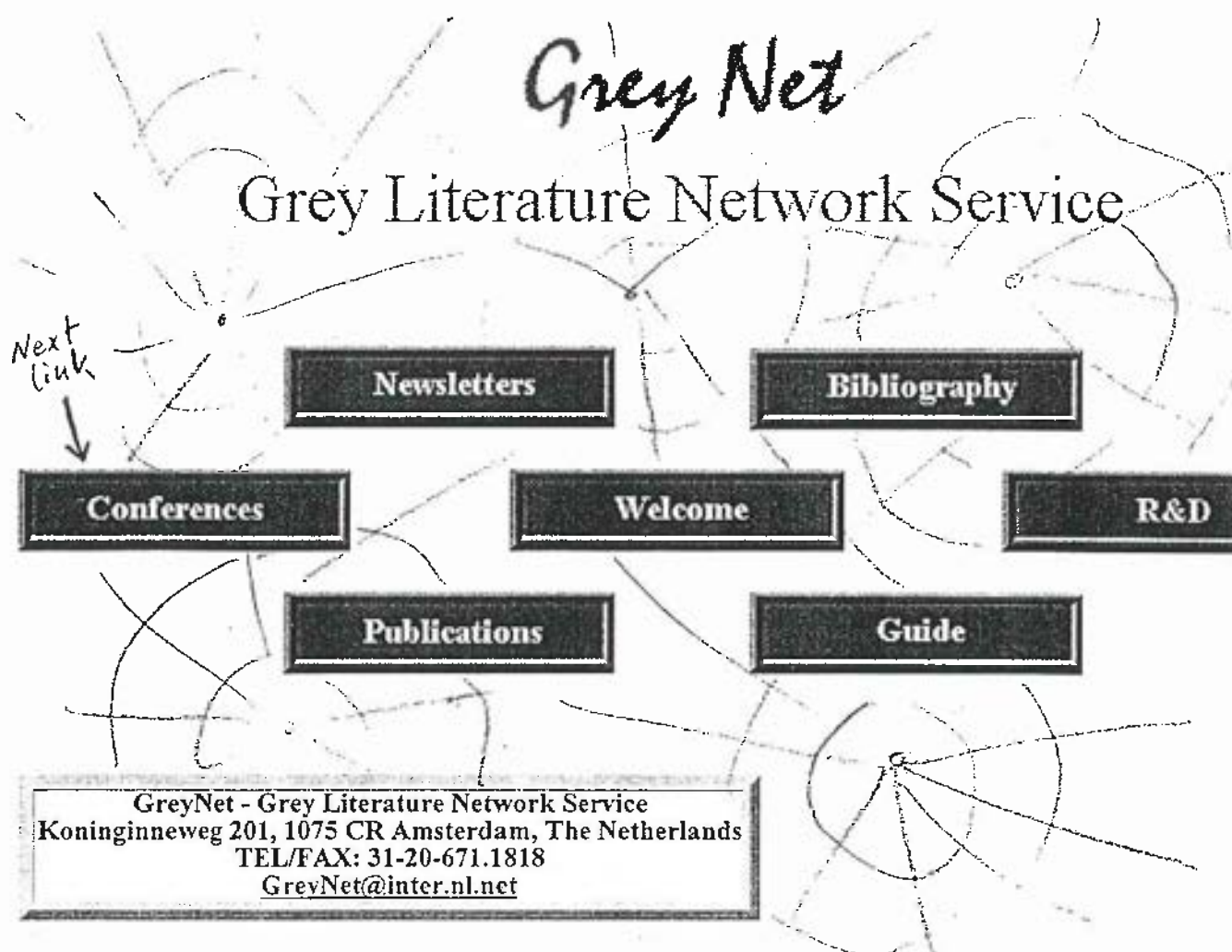
you just have the address of Dominic Farace, you can write him a letter, make a telephone call or send a fax and ask for a printed conference information and an application form. This is the traditional way of getting information.

If, however, you use my calendar of events, you just have to click on Dominic's internet address (URL), and within a few seconds this brings you exactly to the computer with this address, wherever in the world it may be: in Australia or Japan, in Berlin or Amsterdam or just around the corner.

This kind of specially marked internet addresses is called a *hyperlink* or just a *link*. If you click on it, you will see this screen after a few seconds:

Table 3 a-d: Grey Net internet pages

Table 3a: Grey Net Homepage



This is what you get after clicking the hyperlink address. (Sorry: I had to draw the symbolic web myself because my printer refused to print it.) (All "buttons" represent clickable hyperlinks leading to further information.)

If you now click the option "Conferences", this brings you to the next page titled "Grey Literature Conferences" which looks like this:

Table 3b: Grey Net page, next floor

Grey Literature Conferences

**HOME
PAGE**

Introduction

Information about the Seminars and Conferences organised by TransAtlantic in cooperation with GreyNet, Grey Literature Network Service, can be found in this menu. Such information contains the dates and locations, the program and agenda, the names of the speakers and the titles of their papers. Information on how to register for these S&T events is also included.

GreyNet

Grey Literature Network Service

Conferences

- ° [Introduction](#)
- ° [GL'97](#)
- ° [GL'95](#)
- ° [GL'93](#)
- ° [GOGL'98](#)
- ° [The Lustrum](#)

Correspondence Address

TransAtlantic| GreyNet
Grey Literature Network Service
Koninginneweg 201, 1075 CR Amsterdam
The Netherlands

Tel/Fax: 31-(0)20-671.1818
Email: GreyNet@inter.nl.net

GL'97 - Third International Conference on Grey Literature

Main Menu

And if you click once again, this time on "GL'97 - Third International Conference on Grey Literature", you get a multitude of information filling not less than 15 (!) pages in print. It begins like this:

Table 3c: GL'97 Pre-Program

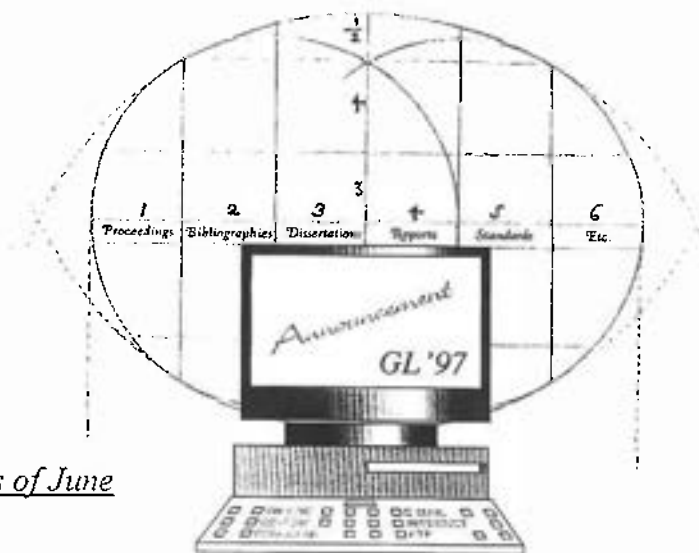
GL'97 Pre-Program

Contents:

- [Foreword](#)
- [Programme](#)
- [Program Committee](#)
- [Time Schedule](#)
- [About the Authors and their Papers](#)
- [General Information](#)
- [Conference Registration Form](#)
- [Birds-of-a-Feather Luncheon](#)
- [Hotel Booking Form](#)
- [Index: Participating Organisations \(as of June 1997\)](#)
- [Index: Authors](#)

THIRD INTERNATIONAL CONFERENCE ON GREY LITERATURE

JEAN MONNET BUILDING, LUXEMBOURG
13-14 NOVEMBER 1997



Foreword

[next topic](#)

[back to contents](#)

While the title *Perspectives on the Design and Transfer of Scientific and Technical Information* reflects the topics and themes that will be incorporated in the Third International Conference on Grey Literature, so also its logo reflects the development that has taken place in this expanding field of information. At the first conference in this series held in 1993, emphasis was placed on printed grey literature. The second conference in this series held in 1995, expanded the scope of grey literature to include electronic publications. And, at this third international conference, which will be held in Luxembourg on 13-14 November 1997, attention will be focused on new uses of grey literature in facilitating the innovation process. A process in which new producers and publishers of grey literature provide us with new forms and types of grey literature. Where new methods and mediums of storing and distributing grey literature create new uses for these resources, and in turn, where new users of these resources demonstrate their further capabilities for scientific and technical gain.

Dr. Dominic J. Farace, Conference Director

Programme

[next topic](#)

[previous topic](#)

[back to contents](#)

... and ends with the *GL'97 Registration Form* which can be sent immediately to GreyNet by e-mail:

Table 3d: GL'97 Pre-Program, Registration Form

GL'97 Registration Form

Conference fee

The conference fee includes attendance at both the Plenary and Cluster Sessions as well as at the Tutorial Sessions. The fee also includes a copy of the GL'97 Pre-Program and Final Program, the conference badge and pouch, as well as attendance at the Inaugural Reception, the lunches, coffee & tea.

Please, Indicate your Choice in your Email to GreyNet:

- DFL. 650 Regular Fee
- DFL. 550 GreyNet Subscriber

Please, send us the information asked for below:

Title (Mr) (Mrs) (Ms) (Dr)

Name: (last, first, initials)

Organisation:

Address/P.O.Box:

Pcode/City/Country:

Please, Indicate your method of payment:

- Remitted to TransAtlantic for GL'97 PostBank Giro 5192147 in Amsterdam, The Netherlands. With mention of the subscriber's name.
- Remitted to TransAtlantic for GL'97 ABN-AMRO Bank No. 54.86.83.557 in Amsterdam, The Netherlands. With mention of the subscriber's name.
- Bank check/draft enclosed and payable to TransAtlantic. With reference to GreyNet 1997 and subscriber's name.
- MasterCard/EuroCard
- VisaCard/JCBcard
- American Express
- Diners Club

Card Number:

Exp.Date

If the name on the credit card is not that of the participant, type the name that appears on the card, below

Name Card Owner:

Send this information to GreyNet@inter.nl.net

So you can read a text - in this case the calendar of events - and, without closing the file with just one click go to further information, which may consist of a single page or of a lot of them (If, for instance, you click the URL of the GESIS institute in Germany, you have the choice between not less than 500 (!) pages of information concerning nearly every aspect of social scientific infrastructure: databases, collections of empirical data, publications, information services, different calendars of events, social scientific clearinghouses and so on and so on.)

Thus, the calendar of events is in a certain sense extended by a lot of information which are stored on different servers all around the world, but can be read as if they were a part of the calendar of events themselves. Such information can be:

- the complete homepage of a conference containing all relevant information about the event: its overall topics as well as the headlines of the different sessions or plenary, the chair people, the schedule, maybe a list of participants or colleagues reading papers and so on.
- There may be additional information about the organizing institution or the hosting institute.
- And in a lot of cases, you can also find an application form you can complete online.

You can read all these information as if they were footnotes or appendices of the calendar of events. So by just presenting the URL as a clickable hyperlink, the calendar of events offers the whole available information on the conference without physically containing it. To understand what that means, just imagine a book with references to other publications. If you are interested in an article mentioned there, you just point out with your fingertip at the reference - and a few seconds later you can read the article itself. Sorcery? Yes - as far as print media are concerned. In the internet, however, this is an everyday miracle.

7. Towards a functional integration of databases and document delivery

These miraculous possibilities, however, can be transferred to databases connected with the internet. After all I said before, the technical aspect of the solution is quite trivial: The databases remain unchanged, and only hyperlinks to servers offering the full text of a report have to be added. That's all. The document description from above now looks like this:

===== Table 4 =====

(To be honest, the e-mail address is "faked". Actually, the Bielefeld Institute of Population Research has not got one, yet, if I can believe its internet homepage.)

This procedure - adding the URL - combines the advantages of databases - i.e. systematic description, indexing, and retrieval of immense numbers of data - and of full text storage, without creating a gigantic "mega-server" and carrying on a tremendous expenditure:

- on one side, a great number of high standard meta-data stored in traditional databases can be searched in the usual way,
- on the other side, we have the possibility to switch to the full text of any hit that seems to be of interest; by just clicking, we can get the text at the very moment we want it.

Table 4: Bibliographic entry in database SOLIS with hyperlinks**SOLIS COPYRIGHT 1997 Informationszentrum Sozialwissenschaften*****Logical part 1: Bibliographical data***

TITLE The Public Sector: challenge for coordination and learning.
AUTHOR Herausgeber: Kaufmann, Franz-Xaver (Universitaet Bielefeld Institut fuer Bevoelkerungsforschung und Sozialpolitik -IBS- <Postfach 100131, D-33501 Bielefeld>)
SOURCE Berlin: de Gruyter. 1991. XI, 553 S. (zahlr. Abb. u. Tab.)
SERIES TITLE: De Gruyter studies in organization, Bd. 31
ISBN: 3-11-012380-0

Logical part 2: Descriptive elements

DOCUMENT TYPE monograph; (Sammelwerk)
COUNTRY Deutschland, Bundesrepublik
LANGUAGE English
ABSTRACT Vorgelegt werden Beitræge aus dem Zentrum fuer interdisziplinære Forschung an der Universitaet Bielefeld zu Problemen der oeffentlichen Verwaltung. In einem ersten Teil werden zunaechst Defizite politikwissenschaftlicher und wirtschaftswissenschaftlicher Forschungsansaetze in bezug auf den oeffentlichen Sektor identifiziert. Es schliessen sich Ueberlegungen zu begrifflichen und verfassungstheoretischen Aspekten des oeffentlichen Sektors an, die Fragen des modernen Staates, des Foederalismus und des Wohlfahrtsstaates eroern. Vor diesem Hintergrund werden Anleitung, Kontrolle und Evaluation als Bedingungen politischen Lernens diskutiert. In einem abschliessenden Teil werden institutionalisierte Formen von Koordination verglichen (Markt, Hierarchie, Solidaritaet) sowie Netzwerke und Beziehungen zwischen Organisationen analysiert. (ICE)

Logical part 3: Descriptors

CONTROLLED TERMS: public sector; public administration; politics; political action; administrative action; evaluation; implementation; political administrative system
CLASSIFICATION CODE 10207* (Sociology of Organisation)
METHODS descriptive; theory application

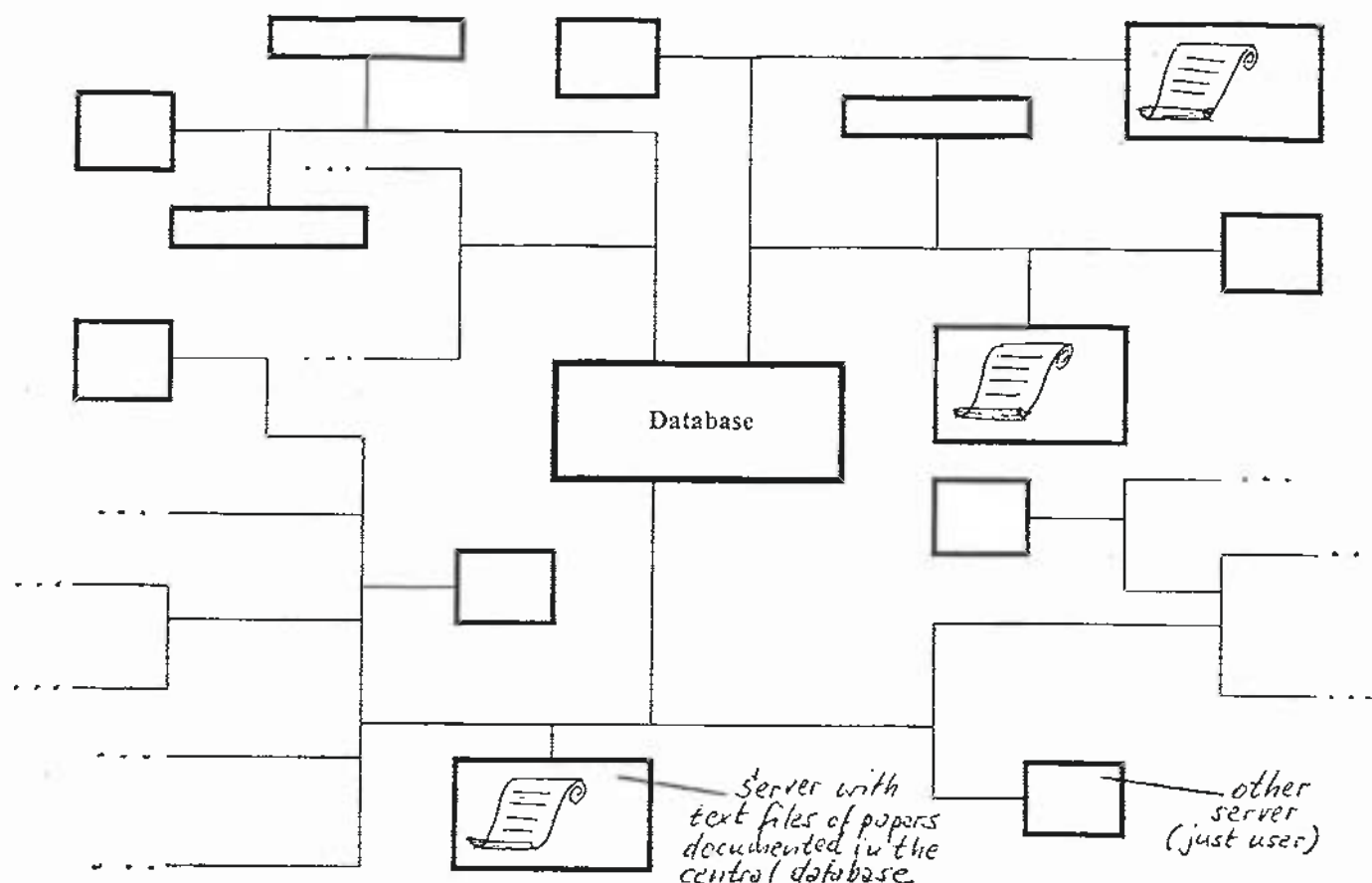
Logical part 4: Hyperlinks

e-mail address: ar@bevoelk.uni-bielefeld.de
Internet address: <http://www.uni-bielefeld.de/IBS/>²

² This internet address should not refer to the *institute* but to special *text files* presenting the grey papers indicated above. - This is just an example. Actually, there is no text file under this internet address!

The whole system would look like that:

Table 5: Structure of internet database with links to full text servers



This would mean a *functional integration of databases and document delivery* which would turn out to be parts of just one single process. The only thing the scientist still needed, is the time to read the texts he can download immediately...

So, the technical side of this conception is completely unproblematic. All technical requirements do already exist and are frequently used in scientific communication. Only "the system" as such must still be propagated and managed. And that is where the real problems begin: with the *institutional and social questions*.

8. The slightly different database II: social and institutional aspects

At first: Why still a database (not a search engine)? What sense do old fashioned databases make in the internet age? There are hundreds, if not thousands of so-called *search engines* automatically and in broad scale indexing millions of internet entries. So why still use databases which make a lot of work and are very expensive?

Those who have already worked with search engines do already know a part of the answer: Generally, the quality of search engines' results is lousy, and this will not change because it is not a question of the software used but has to do with the internet itself, its contents and its ideology. The internet contains material of any kind, of any standard, and of any

absurdity, and the search engines are neither able nor willing to make a distinction, thus telling the valuable from the worthless. Regarding the incredible and still exponentially growing number of entries, it seems that there is no alternative to such a procedure. (Actually, the search engine *Yahoo!*, division *Social Sciences*, has been trying an intellectual indexing, but if you have a look at the results be sure not to recognize the Social Sciences you used to know.)

The second part of the answer refers to the internet's ideology. We all have heard about dissemination of child pornography and extreme perversions (such as a film about the chopping of a human corpse) via internet. Nevertheless, influential groups refuse to any restriction, to any standardisation and to any control of the internet. The internet as the kingdom of unlimited freedom, the empire of *anything goes*.

Under the actual conditions of the internet, some consequences or trends are predictable:

- A qualitative standard can definitely not be warranted for the whole internet, but if at all, then for separate areas with restricted access.
- The "system" will be completely overrun unless there are gate keepers or gate keeping mechanisms. Lots and lots of authors will offer immense numbers of trash, of completely worthless papers that have neither to do with science nor with any scientific or at least qualitative standard. So, the system will collapse under the charge of its own banality. At the time being, e.g., 70,000 or even more than 100,000 hits with an internet search are nothing extraordinary, even with combinations of two or three search arguments which as such lead to strong reductions of hit numbers. And as I said before, the number of internet entries is still growing exponentially.
- As a consequence, the "system" will become completely unattractive for anyone honestly looking for serious papers.
- And so, after a rather short time, the system will degenerate to just an *input* system: anybody puts in, but nobody wants an output. The system as an end in itself.

So, if there is a solution at all, it can only be found outside the net although using it as a technical means.

9. Towards a solution

So what could we do? To say it in a general way: We must control the access to - i.e.: the input in - this system, without, however, building up an organisation and without copying the mechanisms of control of the formal communication system. In other words: We should try to preserve the special advantages of grey literature, including the spontaneity and the freedom from review which is characteristic for formal publication, without on the other side giving way to everyone and to any level of quality.

The decisive, though trivial requirement is that at least the nucleus - the database itself - has to be institutionalized, i.e. that there must be an institution being responsible for it, with specialized personnel and with an adequate budget. This personnel has to build up the database, manage the input, watch for the observance of the rules and sanction offences against them. Only such an institutionalisation can provide for a duration in time. Without it, the whole system will not work.

The other requirements, I think, are not quite as trivial. Beyond this basic institutionalisation, the system should be self-organizing - at least to a certain degree, which means: as far as possible. To fulfill this condition, it needs two sets of social norms or rules:

- norms or rules regulating the **access** and
- norms or rules regulating the **remaining**.

And besides the norms, we need

- mechanisms of *control* as well as
- *sanctions* in case of violation.

All these four sets are necessary to create the system and to make it work, to make it attractive and control it at the same time, without referring to external authorities or even depend on them.

Rules or norms for access could for example be

- membership in scientific societies
- certain formal qualifications (such as a highschool degree)
- the promise to accept, observe and maintain the rules
- the promise not only to contribute papers (or text files) but also to contribute to the documentalist process by delivering bibliographical data, careful abstracts, classification codes, methodological descriptors and so on.

And the rules or norms for remaining could possibly read like this:

- Any paper provided with an URL must really be accessible on the indicated server.
- The author warrants the accessibility of the unchanged text file at least for a pre-defined time. Any changes of contents as well as the deleting of a file are not allowed unless they are immediately announced so that they can be indicated in the database.
- All statements concerning the publication must be correct.
- All contributors are strictly obliged to scientific ethics.

And the sanctions could be:

- If an authors violates the rules or if a scientific ethics commission finds him guilty of unethical behaviour he has to be suspended for a certain time or forever. The necessity of sanctioning is another reason for an institutionalisation of such a database system using the internet.

We are nearly at the end, and it is time to drop a few words on the aspect mentioned in the sub-title: the aspect of self-organisation. This does obviously not mean renouncing the institutionalisation. Quite in contrary, I have insisted upon the necessity of institutionalisation.

So self-organisation can only mean that an institutionalised core develops and provides the technical and formal requirements and that the scientists who are interested in participating make use of these presuppositions. They deliver the bibliographical data as well as the documentalist descriptions of their reports; the full texts are on their home servers and can

be read or downloaded there. And last but not least they bear the whole responsibility for the correctness of information as well as accessibility of the text files.

There are rules, but they are the rules of scientific behaviour . There is control, but it is that of the scientific peer group. And there are sanctions, but they are those of the scientific community. This, too, is an aspect of scientific self-organisation.

10. Conclusion

As I mentioned above, my proposal is a combination of a traditional database, the idea of a fulltext database and the special advantages of the internet.

All technical prerequisites are given at the time being, and their combination is rather unproblematic. What could turn out to be difficult, are the institutional and social questions I talked about in the last chapter. But this, I think, should us not prevent from making a test and perhaps use the already existing European grey literature database SIGLE as a prototype. The host STN International is not connected with the internet, yet, but I am sure this is only a question of time and should not be an argument against an attempt of using hyperlinks in the way I have outlined here. It would not only make databases much more interesting, but grey literature as well.

And that is the most important reason of them all. So let's do it!

./.

Social intelligence for developing countries: the role of grey literature

P. Sturges

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Abstract

The necessity for social intelligence, broadly defined, to inform decision-making in developing countries is apparent as globalization places increasing demands on governments, non-governmental organizations (NGOs), parastatals, and business corporations. Yet the existing information systems of developing countries suffer from a range of problems which afflict all three main elements: documentary services (libraries and information centres), statistical services, and management information systems (including records management and computerized systems). Grey literature is vital to each of these three systems, either as the partially-processed product of the internal information generating capacity of the country itself, or in the external scanning process. Information professionals have tended to concentrate on the technical problems of acquiring, listing, indexing, retrieving and alerting potential users to documents. This largely ignores questions about the capacity and propensity of the targeted users to absorb information, however well it might be organized by information systems. An examination of the decision making process in a selected country (Malawi) and a case study of planning for technology transfer (from Kenya) are used to illustrate these problems and the role of intelligence. A range of structural and nonstructural constraints on the absorption of information is identified. The conclusion is that the problems of existing information systems can only be relieved by information professionals further processing and refining the information content of grey literature so as to present it to the decision-makers in the form of intelligence reports.

1. INTRODUCTION

Social intelligence is a term which has been defined in so many different ways that it may sometimes seem too vague to be useful. However, it does sum up a particular approach to knowledge so well that it is valuable despite such doubts. It is defined by Cronin and Davenport as a 'process whereby a society, organization or individual acquires information in the widest sense, processes and evaluates it, stores and uses it for action'. [1] Perhaps the most important part of this definition is the emphasis on using information for action, and this has been the emphasis used by Stevan Dedijer, whose influential teaching and writing first focused around the term in the mid 1970s. It is apparent from studies assembled by Dedijer and Jequier [2] that there is a considerable necessity in developing countries for an enhanced capacity to use social intelligence to inform decision-making. In this paper the information systems available in developing countries and the context in which they operate, will be examined to show their capacity to provide intelligence for decision-makers. The way in which the content of grey literature needs to be fed into the social intelligence process will be illustrated with case studies.

Specific needs for intelligence have previously been identified by commentators such as Wolfgang Stolper, who in 1966 drew attention to the paucity of information for use in the

planning process in newly-independent Nigeria.[3] Stolper pointed out that there was insufficient information available to the planner on such utterly basic aspects of the country's physical environment as its soils and rainfall. He also drew attention to the lack of knowledge of social structures, traditional culture and beliefs, patterns of land tenure, and many other aspects of people's everyday lives which influenced their development needs, and the acceptability of one programme or project, as opposed to another. Some of these areas of ignorance concerned conditions which might seem to have been permanent or unchanging, and where the need for information could be satisfied by a single research exercise. Most, however, concerned aspects of life which are dynamic and which call for constant observation and monitoring. This points to the need for data-gathering capacity established on a permanent basis. Even though this is difficult to install and potentially expensive, the satisfaction of such information needs can at least be seen as well within the scope of governments and other organizations, since the basic data is available from inside the national boundaries. This is only part of the picture, however, and probably always was only part. Certainly today the whole range of information needed for decision making is much more extensive and can definitely not be satisfied from local sources alone.

2. GLOBAL INFLUENCES

In the 1990s a process of globalization began to sweep the developing world up into the trends affecting the industrialized countries in a way which has made the need for information more acute than ever. Globalization has many facets, most of which are relevant to the subject of this paper in some way or other. Like all large, unifying concepts, globalization attracts cliché, and sometimes seems inexpressible without overused and shallow generalizations. Nevertheless, there are clearly a number of processes which are tending to draw people from all parts of the world together in one global, shared community. Some of these are: communications technology (ISDN, Internet, etc.); financial interdependency (as expressed by the indebtedness of large parts of the world to the financial institutions of the industrialized North); removal of trade restrictions (particularly through GATT, the General Agreements on Trade and Tariffs); international media and the associated cultural homogenization (through TV, films, books, recorded music, etc.); the trade in intellectual property (as mediated by GATT's TRIPS, the international agreement on Trade-Related Aspects of Intellectual Property); multinational business generally (marketing the same products worldwide and manufacturing wherever the financial advantage lies); the activities of the USA, United Nations, European Community and others, as global policemen, intervening in disputes to keep the peace or preserve aspects of the status quo; the ubiquity of certain languages particularly, but not exclusively, English. It is easy to look at the various elements of this brief glance at globalization and recognise the information content or implications of virtually all. The first of these (communications technology) deserves an extra word at this point because of its over-riding significance.

It is worth re-asserting that the power of computing, linked to the capacity of modern telecommunications systems to carry great volumes of data at speeds that are in human terms more or less instantaneous, now effectively destroys the isolation of any part of the world. A developing global information infrastructure promises interconnection without difficulty anywhere on the planet. Local networks are linked to national networks, which in turn communicate with each other via satellites and cabling. Open computer systems offer data and information of a myriad kinds to those who have the (increasingly affordable) equipment. The assistance of the World Wide Web (WWW) enables comparatively well-focused searching

through world information resources. Facilities such as computer shopping, delivery of video and other entertainment media by the same means are beginning to be very widely available, and the potential for a bewildering mix of personal and public communication has become one of the clichés of the information age.

Discussing this in relation to less developed countries sometimes seems a compound of pious hopes rather than reality, but very many aspects of information globalization are becoming real even, for instance, in comparatively poor African countries. To governments barely able to manage the conventional forms of information transfer, this must have nightmare qualities. Flows of data across national boundaries (transborder data flow) relating to the work of banks, airlines and business corporations have been commonplace for years. Once governments have allowed organisations to possess computers and to connect them to telecommunications systems, the ability to monitor and control transactions in currencies, the travel arrangements of individuals, or the dealings of companies in the nation's products, is effectively lost. What is more, the individual citizen can quite easily share this lack of restraint on communication and obtain facts, figures and ideas previously restricted both by access problems and official disapproval. The other side of this, from the government point-of-view, is that access to enormous volumes of information, previously inaccessible because of the clumsiness of recording and transmitting information on paper, can now potentially be employed to their advantage. The Internet is not just a medium for the enthusiastic individual. To cite only one example of the abundant documentation from governments and NGOs, the availability of thousands of US government documents on the WWW allows access not merely to great volumes of data, but vital insights into American official thinking and ways of working. The volume of this can scarcely be exaggerated and, if it can be exploited properly, it goes a long way towards enabling an organization in a developing country to operate at a strategic level. Yet, so far the governments of most developing countries have not made effective use of the global information wealth that is waiting for them, and globalization has often been seen as more of a threat than a series of opportunities.[4]

3. GLOBALIZATION AND THE POLITICS OF INFORMATION

In the 1980s Rita Cruise O'Brien drew attention to significant aspects of the issue of globalization for less developed countries, largely drawing in evidence from Latin America.[5] In effect, she took Stolper's arguments, which mainly applied to internally generated information, and applied them to the external information environment of the developing country. In particular, she showed how the negotiating power of the less developed countries in relation to the industrialized world was profoundly impaired at that time by the former's inability to access the global information networks. The developments covered by O'Brien's book took place in the context of a crucial aspect of globalization for less developed countries, the manipulation of their economies, as an indebted and dependent periphery of the global financial market. The growing indebtedness of developing economies since the nineteen sixties was such that by the world recession of 1979-81 many could not service their existing debts. In Africa, for instance, these amounted to an average of 75 per cent of Gross Domestic Product (GDP) across the continent. At the same time, declining economic circumstances called for further external support. It was at this time that the World Bank and the International Monetary Fund (IMF) began to apply Structural Adjustment Programmes (SAPs) with rigour. The IMF, from 1979, and the World Bank, from 1980, offered loans to governments, conditional upon meeting sets of policy requirements for the adjustment of their economies. These SAPs were designed to shift economies away from state intervention

towards market-led policies. This had the particular intention of reviving agricultural production as a necessary basis for a sound economy. The change was to be achieved by devaluation of currencies, reduction of state expenditure and of subsidies favouring the urban/industrial population. This has been a painful process and SAPs have been identified as the direct cause of considerable suffering amongst the population at large through sharp rises in unemployment, falls in the real value of earnings, and the deterioration of social welfare, health, education and other essential services. This has seemed to very many of those who have commented on SAPs as an impossibly high price to pay for a switch from unsuccessful state intervention to reliance on a form of market mechanism more or less untested in the circumstances of many developing countries.[6]

SAPs can be seen not only as based on a critique of the quality of state intervention in the economy, but, by extension, also as a commentary on the quality of the intelligence used in planning such interventions. The ministries of planning that had been dominant in many developing countries were effectively damned by this approach. They were seen as inflexible monoliths, incapable of reacting to information about circumstances, even if they had the will to do so. By and large, the SAPs favoured subject ministries, whose supposed greater knowledge and expertise in fields such as transport, agriculture, education and health was seen as more likely to result in realistic plans. In fact, such ministries may have been little better, vulnerable at precisely those points in their structure where information is crucial. Indeed, one writer specifically suggests that,

It has to be recognised that these ministries have been, and are likely to remain, very weak at the policy-analytical level.[7]

In Africa it has, nevertheless, been possible to identify an ongoing debate on the role of information in the continent's future, between the proponents and opponent of SAPs from the early 1980s onwards. This dialogue was basically between, on the one hand, the World Bank and the IMF, and, on the other, the Organisation for African Unity (OAU) and the UN's Economic Commission for Africa (ECA). The first important contribution to the debate was the OAU's Lagos Plan of Action, which was agreed in 1980. This had a number of significant things to say about the role of information in development. For instance, on agriculture, the Plan concluded that research findings needed to be made available to the farming community without delay. It accordingly recommended a closer link between research and extension services, and greater emphasis on the spread of proven technologies. The section dealing with industry similarly contained two elements with a strong information significance. It called for the exchange of information among African states on the technical and financial specification of development projects, as a contribution to economic cooperation, and also the creation of institutions to make inventories of shared national resources.

Information on natural resources was identified very strongly as a basic need. The Plan acknowledged that most African countries did not have a full knowledge of their own natural resources, whilst transnational corporations, in contrast, held a great deal of such knowledge. A series of specific proposals were made in response to this, including government assertion of control over the results and basic data (maps, plans, films, logs, etc.) of commercial prospecting. It was recommended that national surveying and mapping institutions should be strengthened, and that national documentation centres be set up to ensure the best possible storage and use of data, including geological documentation, reports, and surveys. The section dealing with science and technology was quite explicit on the potential contribution of information, pointing out that,

Lack of information is one of the most serious obstacles to selection, acquisition, and use of appropriate technology options. An understanding of the local environment, character and orientation of the transferees is as important as information on the technology to be supplied.[8]

The Plan went on to recommend the establishment or strengthening of national technology information centres, liaison between such centres on a regional level, and the undertaking of studies on agricultural and industrial extension services, so as to obtain improved feedback on their effectiveness.

Almost contemporaneously, in 1981, the Bank published a major policy document in the form of its report Accelerated development in sub-Saharan Africa. [9] Whilst its central concern was also economic, it too contained significant statements about information. It identified significant weaknesses in the use of information in public sector decision-making of the type already discussed here. As part of its prescription for the future the Bank suggested intensifying efforts in the areas of knowledge creation and data analysis and a significant strengthening of Africa's statistical services. Specific mention was made of the need for more information on topics such as rainfall, river flows, soil quality, farming systems, and patterns of land use, precisely as Stolper had argued many years before.

The two sharply opposed viewpoints of those who advocated SAPs, and those who proposed a revisionist African development programme, continued to be debated and refined during the 1980s. However, the sense that the quality of information was both a key to the effectiveness of the arguments of the opposing parties, and an important part of any formula for African economic recovery stayed constant. The World Bank continued to have important things to say about information. In Sub-Saharan Africa: from crisis to sustainable development [10], possibly its most significant report of the 1980s, it again drew specific attention to the poverty of Africa's knowledge base. It criticised the inappropriateness of most of Africa's data as well as the techniques employed to collect it, citing: under-funded statistical services, the low priority given to data collection by governments, gaps in the data relating to every sector, inappropriate use of information technology, and an inability to get information to the decision makers. Its recommendations prioritized four main areas: social and demographic data, natural resources and the environment, price and production statistics, and national accounts. It strongly recommended the rehabilitation and strengthening of national statistical and information systems. This was seen as permitting a fundamental shift from decision-making based on speculation and conjecture to an approach based on reliable quantitative information.

In the 1990s the World Bank further confirmed its commitment to the importance of information with a program initiative called InfoDev,

To harness the technology to link people together and to leverage its impact for development, both accumulating the right kind of knowledge and helping our clients to build the capacity to use it.[11]

The Bank now sees itself as having a major role in information sharing, and has begun to fund projects with a view towards both their information role, and the information support available to assist their progress. In particular the Bank has sought an alliance with the ECA whose own African Information Society Initiative(AISI) addresses the same themes.[12] InfoDev and AISI represent a sign that after many years of debate a consensus is emerging between these major players as to what is needed to give information a genuine role in African planning and decision making. Encouraging though this is, it is still only something

which might be formally acknowledged at the rarefied levels inhabited by Government Ministers, senior civil servants and the upper hierarchy of international organisations. Lower down the information chain where the activity that matters must take place things still have changed little.

4. THE INFORMATION INFRASTRUCTURE

Indeed, in 1992, in an article introducing the topic of Information Management in Africa, Kingo Mchombu still felt it necessary to point out that:

One of the hallmarks of a good African civil servant or manager is the ability to take decisions without having all the relevant information.[13]

Today this is not usually because of the absence of an information infrastructure intended to ensure a flow of information to those who need it. In most cases there are elements of such an infrastructure in place. The nature of that infrastructure is worth noting at this point. What one might expect to find in an African organisation are several different types of service. These can be categorized in various ways, and the extent to which any particular category is present in a given organisation varies. Cook, for instance, suggests a fourfold division of information infrastructural services.[14]

He suggests that, first of all, one is likely to find a library and documentation service, essentially handling printed materials arriving from outside the organisation itself. These would range from books and journals to a great range of grey literature. Such a service would also be increasingly likely today to use computers for some purposes. Second, there could be a records management system which would organize current filing systems for mail, memoranda and other internally-generated documents, some of which might be described as grey literature. It would also provide care for non-current documents so that they could be retrieved when needed, and eventually it would appraise the content of the files for retention as archive or, alternatively, disposal. Third, there might be data systems provide by a computer services section. This would look after all aspects of computing, from word-processing and other software used in administration, through to data-processing services which could handle statistical data on behalf of the organisation. Finally, there might a communication service handling postal arrangements, telephones, fax, electronic mail, video conferencing and other such services.

Another way of looking at fundamentally the same group of services, would treat them under four different headings - administrative, documentary, statistical and information technology. The first, administrative, category conforms fairly closely to that described above as a records management system. There is also an implication that the emphasis is more on the current exploitation of the internal documentation of the organisation than on its longterm fate. The second, documentary, category corresponds almost exactly with the library and documentation services described above. The third, statistical, service rather reflects practice in official bodies than in business corporations. Statistical services have long been provided in government ministries and parastatal organisations to collect, process and present data to the decision makers. The collecting and processing aspect of their work would tend to fall within the data-processing part of what was described above as a data systems service. It should be noted, however, that many organisations are moving from data-processing services, as such, towards providing a fully-fledged statistical unit, which is required to present data at least partially interpreted for management use. Finally, an IT section combines all, or most,

aspects of a data systems service and a communications service, so as to provide integrated technology platforms for the work of the organisation.

It is not so much how the various services are categorized, or how they are separated or combined within any given organisation that matters. The point is that an infrastructure with elements that would be easily identifiable in terms of either of the above typologies is present in most large organisations in developing countries, whether in the public or the private sector. It may be somewhat embryonic, or ill-balanced, but it will be there. Yet the existence of an infrastructure consisting of all or some of these types of service does not ensure that information actually plays the part in the decision making process that ideally it should. The status of grey literature is naturally significant across these services, and it is patently obvious that such resources are not exploited to anything like their basic capacity, let alone their full potential. A detailed analysis of just one aspect of the exploitation of the information content of grey literature supports this contention. By looking at the role of grey literature in information service to the rural population by Agricultural Extension Services it can be seen that not merely is the capacity for acquiring and organizing grey literature inadequate, but that there is insufficient ability to repackaging the information content for re-use.[15] A more detailed examination of how information services in Malawi compile information packages for dissemination in the rural areas, confirms this generalization.[16] Arguably, this relates directly to disfunctions in the national capacity to handle and exploit information and intelligence at all levels, which can be directly traced to key aspects of the political economy of the states concerned.[17] Certainly the use or non-use of grey literature and other significant information resources is usually a symptom of failures in the capacity to handle information, which can express themselves in a number of forms.

6. INFORMATION CAPACITY

Robert Chambers characterises one central aspect of the way in which information fails to enter the collective consciousness of those in power as the phenomenon of the 'self-deceiving state'. [18] In this a kind of wilful blindness afflicts many of those who are supposed to know or find out. They may not wish to know all they could, because it might contradict the version of things that dictated by vested interests. These interests might call for the pursuit of particular goals or the following of particular orthodoxies. For instance, there might be too much money, time, and reputation invested in some project or programme to make it easy to let the facts interfere with its continuation.

Chambers also identifies a kind of arrogance of power which tends to render information irrelevant. His condemnation of those who let this arrogance close their minds to the promptings of an exterior reality is sweeping:

Throughout the development decades, most professionals have been confident in imposing on others their own beliefs, and the policies and programmes which follow from them. This includes academics, bankers, bureaucrats, consultants, planners, scientists and technical assistance personnel, and the staff of national ministries, field bureaucracies, donor agencies, and institutes for research and training, both in the North and in the South. Later, many of these beliefs and actions have proved astonishingly erroneous. [19]

This arrogance which tends to marginalise even the best and most appropriate information is not, however the only reason why information fails to achieve the effects which, in theory,

it should. A glance at the type of difficulties that afflict the area of information and decision-making is needed to explain this.

It is true that sometimes the necessary information is not available at all: a nation can simply be information poor. The significance of the idea of information poverty is not, however, the same for everyone within a particular country. It is a description which usually applies much more to the situation of the citizenry in general than to those who hold any form of power or influence. Educated elites have not only a much better access to documentary information but it is also they who have access to computers and the computer-literacy to exploit them. They may not, however, tend to acknowledge the real strength of their position.

A very common reaction at many levels is still to suggest that the information available is simply insufficient to be of real assistance in decision making. There is plenty of reason nowadays to suggest that such statements are often excuses for decision making that is based on instinct, or as a responses to pressures (political, personal, business, etc.) that do not directly arise from the problem in hand. Lack of information is particularly frequently alleged when the decisions that need to be taken necessarily involve high levels of expenditure, or the delegation of important powers to NGOs, such as relief agencies in times of natural disaster. Lack of information is probably still such a familiar complaint because it can effectively shift responsibility on to some other agency. For this reason it is likely to be heard for some time yet. The contemporary problem, however, is that not only has the definition of adequate knowledge been much raised, but at the same time the volume of information which might be accessed has increased to a completely daunting extent.[20] Specific case studies of inadequate use of information, show how difficult it is for conventional information services to function within the harsh and sometimes dirty realities of decision making.

7. CASE STUDY: NATIONAL ECONOMIC PLANNING IN MALAWI

Malawi in the days of Kamuzu Banda, whose power ended in 1994, had a system of administration and planning ostensibly directed towards national development.[21] This system did acquire information and was supposed to apply it to planning for the achievement of a set of longterm goals which had been articulated in a published Statement of Development Policies. The responsibility for the planning process came to be located almost entirely in the Department of Economic Planning and Development, formed in 1985. The main flows of planning information into the Department came from the Treasury Department, which provided statistical projections for planning alternatives, the Reserve Bank of Malawi, which forecasted financial developments, and the National Statistical Office, which provided estimates of Gross Domestic Product. In general terms, the Department had the obvious means for macro-economic planning available, and the data was put together in an annual budget document, the Economic Report.

The various ministries responsible for sectoral programmes and projects submitted their estimates to the Department, where a process of measuring them against needs and resources was to take place. In addition, there was also a capacity for input from the regions via the system of District Development Committees, established in 1965. These were each chaired by the District Commissioner, who was the President's direct representative in the locality. Their membership included: government (representatives of the various ministries active in the District, notably Agriculture, Health and Education); politics (local MPs and officials of the ruling party); the traditional authorities (chiefs and village headmen); an ADMARC (the official Agricultural Development and Marketing Corporation) representative; and various

coopted members. The deliberations of these bodies were to lead to local development proposals, which could be transmitted direct to the Department. In fact, uncertainties over world commodity prices, the political instability of the region, the unpredictability of the aid policies of donor countries, and the difficulty of obtaining reliable intelligence for accurate prediction, encouraged an improvisatory planning process and a tendency to emphasize short-term interests.

A system which on the surface had the elements necessary for the incorporation of national, sectoral and local data, was not in practice capable of producing a consistent policy direction. This tendency was exacerbated by the concentration of power in the hands of the President and his immediate advisers. Since none of the planning bodies, including the Department, had the capacity for long or medium term decision making, a *de facto* process of decentralisation to the Ministers and parastatal bodies occurred over time. This was not, however, really a decentralisation of decision making, more a delegation of functions and routine administration to the bureaucracy. The planning process, and all the information-related elements of it, were thus basically relegated to an exercise in public budgeting, with the Ministries manoeuvring for a better share of the budget which the Treasury had set out. The only real opportunities for innovation were when the ear of the President could be gained.

With the significance of information thus reduced it became noticeable that the mechanisms for gathering, organising and interpreting information tended to fail to operate effectively. For instance, information about the rural areas was gathered by the Agro-Economic Survey (AES), which provided a continuing service to collect and organise baseline data.[22] Data from the monitoring and evaluating of specific projects could then be set against AES data to give it context. The Survey's trained field enumerators and agricultural specialists collected and processed data, producing a steady flow of documentation. This contained precisely the detail of topography, soils, vegetation, climate and rainfall, infrastructure, settlement patterns and farming practices identified as needed by Stolper in 1966. However, the users of this baseline data gradually began to suggest that it was becoming detached from the planning requirements of the Ministries. The process seems to have become academic, producing information which was interesting in its own right, but not always giving direct answers to the questions planners were asking. This was arguably a symptom of a decline in morale in the government data-gathering system at large. If those involved in the planning process did not make proper use of the information which was provided for them, then the data-gatherers felt that there was little point in assembling data in ways that suggested a belief that it would be used to good effect.

8. CASE STUDY: TECHNOLOGY TRANSFER IN KENYA

In 1975 the Kenyan government encouraged Tate and Lyle, a UK-based sugar company to investigate the potential for producing ethanol from the output of the country's sugar mills, so as to meet some of its liquid energy requirements. Ethanol does not have the same energy content as petrol or diesel, but does have a higher octane rating and greater thermal efficiency. It can be used for many of the same purposes as petroleum products and its chief advantage in this case was that its production would partially insulate the country from the effects of the price and supply problems associated with imported fuels. In 1977, three proposals for ethanol projects were submitted and two, both from Kenyan companies with no ethanol experience, were accepted. However, despite considerable investment in an official partnership project, Kenya Chemical and Food Corporation (KCFC), and the licensing of another venture, Agro-Chemical and Food Corporation (ACFC), the programme has proved

almost completely unsuccessful. Work on KCFC's plant stopped in August 1982, and whilst ACFC marketed its production for commercial blending with petrol in 1983, by 1985 its plant was operating at below 30 percent capacity. Government intervention to support sales in 1985 subsequently led to 75 percent use of plant capacity. Continuing research on production has been carried out by Kenya Industrial Research Development Institute (KIRDI) with little visible outcome.[23]

The process by which decisions were made on the ethanol programme reveals some of the reasons for the failures. At least two kinds of relevant intelligence gathering were neglected in the process. First of all, fundamental decisions should have been dependent on good market intelligence. Although the sugar industry was to be the basis on which the programme was built, no investigation was made of the industry's capacity to provide a consistent supply of the raw material for production. Indeed, the vulnerability of Kenya's sugar industry to world market trends, and the role of the special arrangements between producer and consumer countries, unrelated to production costs or demand, by which the bulk of world output was traded, were never mentioned in government documentation on the plans. Nor was there any serious analysis of Kenyan national energy requirements. The process, from the initial Tate and Lyle study onwards, was driven by a perceived need to find a domestic use for a product which was meeting problems in the export market, and which would cause pollution problems if it were dumped.

Secondly there were technology selection decisions in which local information should have had a crucial influence. When it is intended to produce ethanol from sugar cane, there are significant differences in the effectiveness of the different types of cane processing technology that can be used. The older method, open pan sulphitation, has higher energy costs than the more energy efficient vacuum pan process. This higher level of energy efficiency makes vacuum pan plants more suitable in principle for ethanol production. However, vacuum pan plants require higher capital investment and make greater calls on foreign currency resources than the open pan plants, which are versatile and better suited to deal with the inconsistent supply flows of cane from the Kenyan producers. A commitment to vacuum pans might seem more efficient in purely technical terms, but the use of open pans would need less capital and thus more easily admit local entrepreneurs to the industry. This technology would also have better matched the supply conditions in Kenya. In fact, the government chose to enter into technology acquisition agreements with foreign companies, which shifted the balance towards the purely technical imperatives and away from specifically Kenyan needs and conditions. Various unfavourable consequences for Kenyan farming have followed, particularly in the form of uneconomic prices for cane and its by-products.

The failures of the Kenyan ethanol programme were rooted in the lack of an independent institutional capacity to evaluate proposals. There was no real flow of relevant intelligence into the decision making process. Decisions were made on the basis of data submitted as part of project proposals, which was naturally selected by interested parties who were usually foreign investors and manufacturers. The lack of independent data against which to validate proposals enabled companies which had no prior ethanol experience to present their cases as if they did have the relevant expertise. Investment by government departments in the programme further removed the possibility of independent validation, as departments were not required by law to subject themselves to any such procedure. Decisions were regularly based on the advice of civil servants who had no special expertise in the topic, and who were not required to obtain access to such expertise from outside. In hindsight the inadequacies of the ethanol programme were implicit in the decision making process and the information gathering capacity which supported it.[24]

9. IMPLICATIONS FOR INFORMATION SERVICES

These case studies may seem to suggest that in a context of corrupt and inefficient politics and governance there is no scope for information services which seek to serve rational decision making. There are, however, politicians, administrators and executives (even if they may often be a small minority) who seek to promote the general welfare by using the best intelligence available. They deserve access to services which arm them effectively in a difficult struggle. The general public also deserve to be informed as well as possible, through the agency of well-informed media, so that they can play a positive part in the political process. The kind of assistance that is needed seems obvious, but the sheer difficulty of providing it has been stressed throughout this paper. By re-examining the nature of these problems, a view of what might be needed to address them does emerge. Looming over all the other problems, there is the issue of the sheer complexity of the information that must be used for intelligence purposes. This is in no way diminished by closer examination.

Many of the techniques of modern development planning are utterly dependent upon high volumes of complex and detailed data. This is needed to indicate precisely the kind of programmes or facilities required. In planning health programmes, for instance, it is normal to examine statistics of the incidence and geographical distribution of diseases, also of the progress of immunization programmes, and various associated indicators of basic health and welfare. Beyond this, the planners of today would also require detail of dietary intake and the availability of essential foodstuffs, as well as data on the quality of water available across any region for which a programme was proposed. To satisfy such requirements more data is assembled from special surveys on particular topics and more regular data collection exercises of different kinds are carried out. They do not provide a sense of adequacy however, because the information requirement continues to be enhanced beyond what is already supplied.

Fuelling this inhibiting sense of the need for more and more information is the availability of an enormously increased potential capacity to collect and process data. Techniques for data gathering have progressed much beyond the formal (questionnaire-based) survey, or the crude counting techniques used to measure crops in the field or the numbers suffering from some particular health problem. Participatory techniques are now much used. They involve communities in the process of assembling data about themselves, and use techniques drawn from a number of academic disciplines, so as to develop a holistic view of problems. These have done much to improve the quality of knowledge that planners can acquire, but at the same time they have increased the volume of data and the difficulty of interpreting it.

There is also reason to believe that the availability of computer processing power has encouraged data collectors to adopt complex methodologies which tend to result in much enhanced outputs from the collection process. This has meant that those who do have good information access quite often obtain much more than they can handle. In this situation, local and national databases in profusion actually provide so much detail that their content can become quite detached from decision making. Just because it is possible to generate much more information, there is the temptation to do just that. The almost inevitable outcome of this is for the information to be very good, in an abstract or academic sense, but detached from the practical realities of government or business, which were the reason for its creation in the first place. There is a sheer surface gloss to information derived from sophisticated collection techniques, subject to automated processing, and, most of all, presented with a plethora of visually pleasing charts, tables, and graphs. This can easily conceal a lack of relevance, or fail to indicate the complexities which underlie a beautifully comprehensible visual presentation generated by the computer.

Because there is information of many kinds passing through the ministries and other

institutions of the state, there is always the temptation to assume that it must contain the answers that are required in a particular planning or administrative contingency. This may or may not be true, but to find out whether or not it is true can be too daunting a task for even a determined researcher or politician. Information may be collected, stored and disseminated in considerable quantities, but it may be very hard to find out just what is being collected and made available by any given institution. Quite simply, no one may know just what information is being produced by which organisation and in what forms it is available. Information is collected at all sorts of levels, national and local, it is collected in relation to particular sectors, education or health for instance, and by different agencies, official and non-governmental. At some points in this landscape, there may be those who guard their information for the prestige and influence it might bring: there may be those who simply do not have the resources or guidelines available to them to distribute their information effectively. This could be identified as a problem of lack of an official policy on information, or, more generally a lack of a full sense of information as an important resource whose value-in-use needs to be maximised at every possible opportunity. However, the most important inference which can be drawn from this examination of complexity is that the information which is available is quite obviously not in forms which are convenient for the use of busy decision makers.

Statistics services, for instance, collect very large volumes of data which they process in ways which allow it to be expressed in tables, often permuted in various alternative formats, and generally used to permit a very full and multi-faceted documentation of whatever aspect of life and society has been measured by counting. When such riches are possible, it may be agonizing for the service to digest the information into a compact report format, even though there may be a certain awareness that only in a compact and scannable form does the information stand any chance of impinging on the consciousness of some maker of policy. Similar things can be true of documentary resources. A library may have books, articles and grey literature on a topic in sufficient profusion to enable several theses to be written, but anything more than a digest of some of the content of the most relevant items will not be acceptable at the top level of an organization. The material tends to be collected because it might some day be useful, rather than because it can be shown that it will be needed for predictable specific purposes. These are failures which can be remedied, even though the remedies will not be simple to apply.

10. REFINING INFORMATION FOR SOCIAL INTELLIGENCE

Before information can be submitted to those who might use it in decision making, it needs to be processed for effective use. In this first place this might simply involve what is known as consolidation of information. Ideally, however, it could go somewhat further. The information could be refined for use. Consolidation, as described by Saracevic and Wood, [25] attempts to provide users with all that is basic and essential about a document or group of documents, as far as possible from the point-of-view of the creator of the document. Refining seeks to take out all that is really valuable and significant from a document, or a variety of non-documentary sources, putting it in a form especially designed to help a particular user or users. Consolidation is still the action of the librarian or other similar information professional, seeking to make sure that documentary information is available for effective use 'just in case' it will be needed. Refining is the task of a subject expert, or member of a management team, so that often fragmentary information sources are interpreted in combination with each other, and the interpretive summary made available 'just in time'.

The focus in information refining is on creating a wholly new and probably quite ephemeral information synthesis, rather than on an information product designed for use and re-use.[26] It is quite clear that grey literature and other information resources deliberately stored by information professionals, however well-organized, are passive. They wait to be used, and to a great extent, they are not used at all. In the refining process, documents are read by a specially trained analyst, as opposed to merely being stored for possible future use. The process results in reports which offer expert interpretation and reveal cross-links not obvious from single sources. To achieve this the analyst applies to the sources techniques of content analysis originally developed for military intelligence, the social sciences and literary criticism.

This involves the analyst pulling together significant data on a topic from the whole range of available sources. This is done according to a content classification scheme derived from the experience of working in the subject area concerned. Current computer network and database facilities make a major contribution to the process of identifying the items to be analyzed. The analyst then writes short narratives using information and extracts from the sources identified as related to the topic. A significant aspect is that the analyst seeks to retain the original 'voices' of those who reported the facts in the first place, so that their perceptions are not rubbed out during the refining process. What should then emerge is a systematic account of events, seen through the eyes of the original reporters, as interpreted by the analyst. Such narratives have the ability to reveal the types of trend which may not be at all clear from reading an isolated document or particular form of documentation. Their creation is arguably the apogee of the intelligence process.

Decision makers with refined information on their desks have little excuse for poor policy and implementation. If the intelligence is available to them the responsibility falls squarely upon their shoulders and their answerability in the forums of public debate is much clearer than it has been in the past. Information workers, in turn, should not make the excuse that because they have collected and hold the relevant grey literature and other materials their responsibility is fully discharged. Unless their holdings are, to some extent at least, fed into a refining process the existence of these holdings represents potential rather than achievement. The provision of social intelligence may not be precisely the duty of each individual information worker, but participation in the intelligence process is indeed the true justification of their employment.

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EMERGING TRENDS IN THE GLOBALIZATION OF KNOWLEDGE: THE ROLE OF THE TECHNICAL REPORT IN AEROSPACE RESEARCH AND DEVELOPMENT

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SUMMARY

Economists, management theorists, business strategists, and governments alike recognize knowledge as *the* single most important resource in today's global economy. Because of its relationship to technological progress and economic growth, many governments have taken a keen interest in knowledge, specifically its production, transfer, and use. This paper focuses on the technical report as a product for disseminating the results of aerospace research and development (R&D) and its use and importance to aerospace engineers and scientists. The emergence of knowledge as an intellectual asset, its relationship to innovation, and its importance in a global economy provides the context for the paper. The relationships between government and knowledge and between government and innovation are used to place knowledge within the context of publicly-funded R&D. Data, including the reader preferences of NASA technical reports, are derived from the *NASA/DoD Aerospace Knowledge Diffusion Research Project*, a ten-year study of knowledge diffusion in the U.S. aerospace industry.

INTRODUCTION

Knowledge is a building block, an essential ingredient of technological innovation. Innovation is necessary for creating *new* processes, products, systems, or services. Advances in knowledge are widely regarded as major sources of *improvements* in existing processes, products, systems, or services. The rate at which knowledge is created, diffused (i.e., spread, distributed, transmitted), and absorbed or utilized influences the rate of technological innovation and progress (Mansfield, 1984, 1981). Advancements in technological innovation require investments in capital, labor, and knowledge to produce tangible results that are sold in today's global markets. A firm that produces processes, products, or systems or delivers services is deemed competitive if it can provide goods and services of superior quality or lower costs than its competitors. Countries with many competitive firms typically have high rates of economic growth and standards of living, hence the interest on the part of governments in technological innovation and progress.

For many economists, knowledge is the catalyst that helps allocate resources and makes a free market function. Economists now view knowledge as an engine of change and embrace it in their theoretical constructs. Many economists see knowledge living up to Daniel Bell's (1973) prediction: Knowledge will replace capital and energy as the primary wealth-creating assets, just as capital and energy replaced labor and land (Haeckel and Nolan, 1993). In an economic sense, knowledge differs from other so-called commodities or resources: (a) it is not depleted with use, it is sharable, and traditionally, it has had no intrinsic value; (b) it is difficult

to distinguish between knowledge and the medium in which it is contained; (c) except for knowledge-based products and services designed to be sold, most knowledge lacks markets in which value can be determined by supply and demand; (d) unlike other so-called commodities or resources, the overwhelming importance of knowledge is as a public good (Noll, 1993); and (e) numerous individuals located at various points across the globe can possess the same knowledge, unlike other commodities or resources (Brinberg, Pinelli, and Barclay, 1995; Brinberg and Pinelli, 1993). The past 20 years have witnessed the propensity of knowledge to cross national boundaries, a phenomenon that observers have labeled the *globalization of knowledge*. The boundary-spanning propensity of knowledge is due mainly to improvements in communications (e.g., the Internet), transportation (e.g., international air travel), and the fact that developed and developing countries are spending more on creating and acquiring knowledge. The globalization of knowledge requires that firms and organizations involved in innovation construct and employ strategies for exploiting extramural research and development strategies and systems for acquiring knowledge produced around the world to compete in today's global economy (Ives and Jarvenpae, 1993).

KNOWLEDGE

Knowledge has replaced financial capital as the main producer of wealth. A new "information capitalism" now dominates the world economy; industries that have moved into the center of the economy in the last 40 years have as their business the production and distribution of knowledge and information (Drucker, 1993a, 1993b; Machlup, 1962). Knowledge *qua* capital represents a new and vital factor that must be added to the three factors of production—land, labor, and financial capital—traditionally studied by economists (Zhang, 1993). However, knowledge *qua* capital, or production asset, defies easy definition; therefore, existing economic theories cannot be applied to explain its behavior (Drucker, 1994). Schmookler (1966) points out that knowledge may be valued for its own sake, as a "public good," or for its application, through which it becomes a "private" or "capital good." Theorists posit a positive relationship between knowledge accumulation and economic growth (Hayek, 1945). To develop a theory of the economics of knowledge, Romer (1990), Schwartz (1992), Scott (1989), and others have begun to investigate the economic behavior of knowledge and its role in innovation.

The international business community has come to view knowledge, particularly specialized knowledge, as an essential ingredient for competitive success (Blackler, 1993). Management theorists expect improvements in knowledge-based work to contribute significantly to industrial growth and gains in productivity in the U.S. and abroad (Davenport, Jarvenpae, and Beers, 1996). Effectively managing the creation, transfer, and use of knowledge resources is now regarded as critical for the survival and success of organizations and societies alike (Hedlund and Nonaka, 1993). Firms in such diverse industries as chemicals, pharmaceuticals, financial services, and telecommunications already consider the strategic management of knowledge—the "intellectual assets" of an organization (Hall, 1989, p. 53)—a key corporate activity and have implemented knowledge management programs. These programs emphasize the criticality of knowledge as a competitive asset and seek to maximize the ability of an organization to integrate and use various kinds of knowledge (Aaker, 1989; Bartmess and Cerny, 1993; Buckholtz, 1995; Conner and Prahalad, 1996; Grant and Baden-Fuller, 1995).

Knowledge Defined

Knowledge has been variously labeled, described, and defined. It can be scientific or technical, embodied or disembodied, tacit or explicit, and product or process knowledge. *Scientific knowledge* is embodied in the laws, principles, and theorems of a specific discipline (e.g., Newton's three laws of motion in physics). It is easily codified and is unlikely to be altered by language and culture. *Technical knowledge* tends to be narrowly focused or specific; it is not always predictable, and it does not necessarily spring from scientific knowledge. Technical knowledge is not the application of scientific knowledge. It may be applicable to a particular technology like the manufacture of aircraft, but it is not easily transferred or applied to another technology. It is cumulative to an individual, groups of individuals, and organizations; it is derived from learning-by-doing (Arrow, 1962a; von Hippel and Tyre, 1995; Wright, 1936) or learning-by-using, and it is not easily or accurately codified. For example, after a particular jet engine has been in use for a decade, the cost of maintenance may have declined to only 30% of the initial level as a result of learning-by-using (Rosenberg, 1982).

Learning-by-doing and learning-by-using generate a substantial amount of what Rosenberg (1982) defines as *embodied* and *disembodied* knowledge. In the first case, early experience with a new technology leads to a better understanding of the relationship between design characteristics and performance that permits subsequent improvements, which over time lead to an optimal design of an aircraft, system, or component. Optimization may be achieved by applying advancements made in other areas like materials, manufacturing, or miniaturization. *Disembodied* knowledge results in slight but often continuing changes in design and operation that result from the experience of making or operating an aircraft. Prolonged experience with an aircraft, system, or component produces knowledge that can be used to lengthen the service life of an aircraft or reduce its operating cost. Rosenberg makes the point that disembodied knowledge is critical to aircraft design and manufacture because it is only through actual operation that the true performance (i.e., characteristics and costs) and full potential of a new aircraft can be determined. Vincenti (1992, 1990) provides excellent definitions and examples of knowledge as applied to aeronautical engineering. *Inside the Black Box—Technology and Economics* (Rosenberg, 1982, Chapter 6) offers convincing examples of both learning-by-doing and learning-by-using within the context of aircraft production.

When a firm or organization innovates, that is, creates or improves a process, product, system, or service, it generally does so by using both *tacit* and *explicit* knowledge. Polanyi (1966) provides the following basic definitions for these two types of knowledge: *Tacit* knowledge is personal, context-specific, and therefore, hard to formalize and communicate; *explicit* knowledge is codified and refers to knowledge that is transmittable in formal, systematic language and includes grammatical statements, mathematical expressions, specifications, and manuals. Bateson (1973) offers the following distinctions between these two types of knowledge: Tacit knowledge tends to be experiential and subjective. It is derived from practice, created "here" and "now" in a specific context, and entails what Bateson refers to as an "analog" quality; whereas explicit knowledge tends to be rational and objective. It is derived from what is known and accepted, was created "there" and "then," and it is oriented toward context-free theory. Tacit knowledge cannot always be codified because it often contains an important dimension of "know-how." Individuals may know more than they are able to articulate. When knowledge has a high

tacit component, it is extremely difficult to transfer without personal contact, demonstration, and involvement. Indeed, in the absence of close human contact, the diffusion of knowledge is sometimes impossible (Teece, 1981). Von Hippel (1994) argues that tacit, unlike other forms of knowledge, is often costly, difficult, and sometimes impossible to acquire, transfer, and use owing to the attributes of tacit knowledge itself. For an explanation of tacit and explicit knowledge within the context of *technical knowledge*, see Alic, Branscomb, Brooks, Carter, and Epstein (1992). Nonaka and Takeuchi (1995, Chapter 2) have proposed a theory of knowledge creation relative to the dynamics of technological innovation that contains four modes of knowledge conversion: tacit to tacit (socialization), tacit to explicit (externalization), explicit to explicit (combination), and explicit to tacit (internalization).

Knowledge as Intellectual Capital

Knowledge is an integral factor in innovation, technological change, and the economy (Nelson, 1996; Drucker, 1985). Edvinsson and Malone (1997, p. 3), referencing Wriston (1992), state that "the new source of wealth is not material, it is information, knowledge applied to work to create value." Wright (1994) notes that knowledge and knowledge-based resources are both enabling and constraining factors in the development of innovation and competitive advantage. Whereas its importance may not be fully understood in terms of economic theory, the belief that knowledge is playing an increasingly important role in the world's economy is now accepted as fact (Micklethwait and Woolridge, 1996). It is now widely accepted that a firm's competitive advantage flows from its unique knowledge (Nonaka, 1991). Competitive advantage is often determined more by the knowledge that a firm is able to keep to itself and less by knowledge that is readily diffused, imitated, exhausted, or appropriated (Kogut and Zander, 1992; Spender, 1993). Persistent, sustained competitive advantage cannot reside within the latter.

Knowledge as a concept is open to different interpretations (Popper, 1972). It is different from data and information (Hedlund and Nonaka, 1993). Although not always clear-cut, the distinction among the three in production processes is very important (Bohn, 1994). *Data* are what come directly from sensors, reporting on the measured level of some variable. *Information* is "data" that have been organized or given structure, that is, placed in context and thus endowed with meaning (Dretske, 1981; Glazer, 1991). Information tells the current or past status of some part of the production system. *Knowledge* goes further; it allows the making of predictions, causal associations, or prescriptive decisions about what to do (Bohn, 1994). Knowledge usually manifests itself as a product or service. Firms create products using both internal and external knowledge.

At a fundamental level, knowledge is created by individuals. The organization or firm creates a context and provides the environment for individuals to create knowledge (Cleveland, 1985; Lave and Wenger, 1991). Organizational knowledge creation, therefore, should be understood in terms of a process that "organizationally" amplifies and crystallizes the knowledge created by individuals (Nonaka, 1991). In its simplest form, knowledge has been defined as "knowing things" about something. Through the centuries, society has tended to recognize and reward individuals and groups of individuals (e.g., legal and medical professions) who know things (Sakaiya, 1991). Knowledge as power, knowledge residing within the firm, knowledge gained from learning-by-doing and learning-by-using, knowledge creation and utilization, and knowledge communities are well established concepts.

The concept of knowledge as intellectual assets or intellectual capital, although not new, has recently garnered significant attention within the context of knowledge-intensive or knowledge-based organizations, innovation, and knowledge management (Stewart, 1997). Intellectual assets have been categorized by Hall (1989) as intellectual property (i.e., assets with property rights, like patents, trademarks, and copyrights) and knowledge assets (i.e., reputation, goodwill, personal and organizational networks, databases, and the knowledge and experience of employees). Brooking (1997) has identified four categories of intellectual capital—market assets, intellectual property assets, human-centered assets, and infrastructure assets.

Market assets are derived from a company's relationship with its market and customers. For example, market assets for the aeronautics portion of the National Aeronautics and Space Administration (NASA) include customers (both civilian and military), reputation (and integrity) in the marketplace, repeat business (especially when customers have alternative choices), and product line(s) (knowledge created by NASA and the problem-solving capability of the organization).

Intellectual property assets include know-how, trade secrets, copyrights, patents, and trade and service marks. In the case of such public entities as the NASA aeronautics program, intellectual assets have three dimensions. *First* is the collective know-how, skill, and experience of the workforce. In NASA aeronautics, know-how includes what the enterprise as a whole knows about aeronautics, the related disciplines, or a particular aspect of aeronautics. A *second* dimension concerns the protection of intellectual property. Working with both commercial and military aeronautics, NASA is required to protect intellectual property that is propriety to a company like Boeing or Lockheed Martin or that is classified for reasons of national security. The *third* dimension concerns the NASA aeronautical knowledge base, including the diffusion of the knowledge created through public funding, in particular, those research results that can provide the U.S. aeronautics enterprise with an advantage over competitors.

Human-centered assets are the collective expertise, creative and problem-solving capability, leadership, and entrepreneurial and managerial skills embodied in the employees of the organization. Collectively, according to Brooking (1997), they constitute a knowledge-based workforce whose expertise resides within their heads. Human-centered assets differ from market, intellectual, and infrastructure assets in that they cannot be owned by the company. It is expensive to hire, sustain, and train employees. Consequently, organizations seeking to maximize their return on investment (ROI) must (a) know what skills, knowledge, and expertise each employee possesses; (b) provide an environment conducive to learning and collaboration; (c) encourage professional development; and (d) know how and why each employee is valuable to the organization. Human-centered assets, past and present, combine to give NASA its aeronautical know-how. *Infrastructure assets* include the facilities, elements, and components of the organization. They are the skeleton and glue of an organization (Brooking, 1997). The condition and operation of these assets have a direct bearing on the collective efficiency and productivity of the human-centered assets. Common infrastructure assets include buildings, roads, and utilities. The infrastructure assets within NASA aeronautics include, for example, the many unique wind tunnels (e.g., Ice-Research Tunnel), computational facilities (e.g., Numeric Aerodynamic Simulator), and research aircraft (e.g., F-15-XL). In a knowledge-based organiza-

tion, information technology (i.e., hardware, software, and networks) is considered an important infrastructure asset. The relative age, compatibility, and interoperability of information technology indirectly affects an organization's market assets, intellectual property, and human-centered assets.

GOVERNMENT, KNOWLEDGE, AND INNOVATION

Although innovation is an investment decision generally made within a firm or organization, it is also influenced, to a large extent, by public policy and the resulting laws and regulations that affect the mobilization of capital and labor (David, 1986). Government plays a major role in creating the knowledge that drives innovation through direct funding of science and technology. In addition, government decisions *potentially* have a significant impact on knowledge diffusion. Governments typically support a range of programs, from those that simply collect knowledge and make it accessible, to those that actively seek to couple knowledge with potential beneficiaries. Finally, the adoption and utilization of knowledge and innovation can be influenced through a variety of programs that provide special considerations, incentives, credits, and protections affecting investments in labor and capital.

Government and Knowledge

Governments adopt strategies and policies that they determine will enable their individual countries to be safe from external attack and to be economically viable. Innovation strategies may be categorized as follows: "mission-oriented," "diffusion-oriented," and some combination thereof (Ergas, 1987). The former is characterized by large-scale project work, centering on large firms with a heavy emphasis on areas such as defense, nuclear power, and aerospace. The latter emphasizes broader, more generalized forms of investment, notably in pre-competitive, collaborative research, standards development, and training. The former strategy emphasized the creation of knowledge over utilization of existing knowledge. In a mission-oriented strategy, knowledge diffusion is often not included or it is added as an after thought. A diffusion-oriented strategy seeks to strike a balance between knowledge creation and knowledge utilization. The diffusion of knowledge is a strategic and integral component of a diffusion-oriented strategy.

Government innovation strategy that emphasizes *knowledge creation*, in and of itself, will not ensure a nation's competitiveness in today's global economy. As Alic (1991, pp. 65-66) points out, "innovation depends heavily on existing knowledge, often more so than on new knowledge New knowledge, at least in the sense of research results, rarely has direct bearing on competitive outcomes." To compete effectively in a changed global economy, nations that emphasize knowledge creation as an innovation strategy might be wise to rethink such policies for the following reasons. *First*, knowledge has become a competitive resource and the currency of the global economy. *Second*, knowledge as an asset has profound implications for government policies and programs affecting innovation and competitiveness. *Third*, in a global economy, knowledge becomes an asset rather than a by-product of research and development (R&D). *Fourth*, given the globalization of knowledge, a diffusion-oriented, capability-enhancing innovation policy becomes desirable over a mission-oriented innovation policy as a strategy for government-supported innovation (Ergas, 1987). *Fifth*, the effectiveness of a diffusion-oriented,

capability-enhancing innovation policy is increased by including a system and methods for effectively and strategically managing the knowledge that results from government-funded R&D.

Government innovation strategies that emphasize *knowledge creation* reflect the dominant political-social view that (a) the route to successful innovation is through basic research, (b) the knowledge necessary for successful innovation comes from basic research, (c) technology is little more than applied science, and (d) apart from basic research, the remaining components of product and process innovation (e.g., design, development, production) are not the purview of government and, therefore, should be left to the private sector. Increasingly, the importance of the linkage between the knowledge generated by basic research and commercial innovation has come under challenge (Kash, 1992). In fact, critics have begun to question the existence of a linkage. Study results indicate that economically successful innovation is frequently the product of incremental improvements in existing technologies (Kash, 1989) and that many breakthrough innovations stem from invention or trial and error learning, rather than basic research (Constant, 1980).

Furthermore, innovation is an inherently uncertain undertaking that involves the use of human and financial resources coupled with knowledge and technology to create new or improve existing products, processes, and services. As a system, innovation interacts with government at two basic levels. The first relates to harnessing knowledge and technology for public purposes. The second arises from the reliance of innovation on social context; that is, education and training to create a skilled workforce; a legal framework for defining and enforcing intellectual property rights, laws and regulations conducive to innovation as an essential engine of growth; and a variety of public policies that support the production, transfer, and use of knowledge and technology.

Additionally, industrial R&D funds are becoming scarce. To maximize scant resources, firms have begun developing R&D partnerships—cooperative arrangements in which companies join with other companies, universities, and government laboratories—to pursue their mutually agreed-upon R&D objectives. The participation of government agencies and government laboratories in R&D partnerships and cooperative arrangements raises questions about the proper role of government in innovation. Participants in these arrangements agree to share costs, resources, and expenses. The ownership and use of R&D results are usually covered in such cooperative (written) arrangements. However, ownership, use, and protection of intellectual property as a public or private good (and capturing its revenue, in particular) have become increasingly contentious factors in many government, industry, and university arrangements.

The most highly developed, currently successful innovation is carried out by the partnerships (i.e., academia, government, and industry) that have evolved in aerospace, agriculture, and medicine (Kash, 1989). These partnerships exist at the levels of complexes and networks. A complex refers to all of the organizations in a particular sector (e.g., aerospace) that are either involved in or contribute to the process of innovation in that sector. Each complex is characterized by multiple and ever-changing networks involved in the innovation of the products, processes, and systems specific to each sector. Networks are composed of the collective expertise located in organizations that innovate and create the products, processes, and systems used in the sector.

Lastly, individuals, firms, and governments alike have begun to recognize the importance of knowledge and technology to innovation (Drucker, 1985), for the wise use of knowledge and technology has a direct bearing on a firm's and nation's competitive advantage. Increased spending on science and technology by all industrialized nations, coupled with global transportation and communications capabilities, has decreased the lead time that any firm may have with respect to acquiring and applying knowledge and technology. Consequently, many firms and nations have come to view both explicit and tacit knowledge (i.e., knowledge embedded in processes and products; Badaracco, 1991) and technology as strategic intellectual assets that can be managed to gain or improve competitive advantage in a global economy (Alvesson, 1995). Firms and nations now also accept that funding knowledge and technology creation and utilization, although costly, are legitimate expenditures and, therefore, have begun to implement strategies, policies, and tools for managing intellectual assets. The understanding of and commitment to knowledge as a source of competitive advantage are quite different among governments.

Government and Innovation

The process of innovation, applied within a capitalist system, relies primarily on market forces and the use of human, technical, and financial resources to create new and improve existing processes, products, systems, and services. However, investments in creating and improving knowledge differ from investments in physical capital in that the results, once produced, become, in principle, free goods unless steps are taken to prevent that from happening (Matthews, 1973). This creates a basic public policy dilemma. If exclusive rights are granted to those investing in creating and improving knowledge, from a social perspective, the use of that knowledge becomes wastefully restricted. If no such rights are granted, no incentive exists to invest in creating and improving knowledge. Without knowledge, there is no innovation. Innovation begets technical progress and economic growth, and economic growth fosters technological innovation, creates jobs, and generally raises the standard of living. Therefore, from a public policy perspective, government funding of science and technology provides considerable social benefits.

Government interacts with the process of innovation at three essential levels (Ergas, 1987). *First*, the government promotes the generation of these critical public goods—technological innovation—through the production and purchase of goods and services. Though this type of government involvement has frequently been limited to goods and services integral to providing for the nation's defense and military security; governments have also intervened to encourage knowledge creation and technological innovation that could benefit the commercial sector. For example, NASA's precursor—the National Advisory Committee for Aeronautics (NACA)—was charged with the creation and development of aeronautical knowledge and technology that would benefit *both* military and commercial aviation. (Much, if not most of this knowledge and technology, was documented in technical reports.) More frequently, many governments around the world, including in some cases the United States, have targeted commercially relevant knowledge and technological innovation as a critical component of their overall economic security and competitiveness.

Second, the government facilitates the creation of knowledge and the development of technological innovation and the creation of new and improved processes, products, systems, and services by funding science and technology. Funding occurs at many levels—through entities

such as the National Science Foundation (NSF), through Congressional legislation targeting specific knowledge and technology needs, through grants to universities, and through partial funding to a variety of research consortia such as the IC² (Innovation, Creativity, and Capital) Institute at the University of Texas at Austin or the Agile Manufacturing Research Institutes (AMRI) at Rensselaer, University of Texas at Arlington, and the University of Illinois.

Third, the government supports the education and training of engineers and scientists, provides a legal system for defining and enforcing property rights and contracts, and maintains a uniform system for conducting commerce (i.e., weights and measures, currency values, and interest and exchange rates). Such activity helps to create the “human capital” imbued with the requisite types of knowledge and skills that enables them to create private knowledge and technology, to innovate, and to create private goods incentives (e.g., new and improved processes, products, systems, and services) through patents and copyrights that will protect and generate economic compensation for innovation, and to create a stable and predictable market environment that is imperative for wealth-creating trade to occur.

Although every national government employs a variety of these “intervention instruments” to promote knowledge creation and innovation, tradition and political culture have combined to forge different styles—some more “activist” than others—among nations. For example, “mission-oriented” knowledge and technology strategies are characteristic of the U.S., the U.K., and France. Germany has adopted a “diffusion-oriented” strategy. Japan has adopted a unique hybrid approach to knowledge creation, technological development, and innovation. Moreover, European countries—both individually and collectively—and Japan are more likely to intervene directly and proactively (in knowledge creation, technological development, and innovation) using transparent public policy tools to achieve specific goals, whereas the United States tends to intervene less directly, only occasionally proactively, and often using less opaque public policy tools.

THE NASA TECHNICAL REPORT

The technical report is a primary means by which the results of R&D are documented and disseminated throughout the U.S. aerospace industry. However, little is known about this information product in terms of its actual use, importance, and value in diffusing the results of R&D. NASA maintains scientific and technical information (STI) system for acquiring, processing, announcing, publishing, and transferring the results of government-performed and government-sponsored research. Within that system, the NASA technical report is considered a primary mechanism for transferring the results of this research to the U.S. aerospace community.

Use and Importance of NASA Technical Reports

Within the context of other forms of literature, about 78% of the participants used NASA technical reports. Participants were asked to indicate the number of times they had used NASA technical reports during a six-month period in the performance of their professional duties. On the average, NASA technical reports were used about 11.5 times. Participants were asked to indicate, from a list of choices, their reasons for not using NASA technical reports. Reasons for nonuse, in decreasing order of frequency, include (a) not relevant to my research, (b) not used

in my discipline, and (c) not available or accessible. Participants who used NASA technical reports were asked how they usually use them. The responses indicate that NASA technical reports are used for three general purposes: education/professional development, research, and management. About 64% indicate that they use NASA technical reports for research purposes and about 16% indicate that they use NASA technical reports for education/professional development. About 13% indicate they use NASA technical reports for management purposes. NASA technical reports are important to U.S. aerospace engineers and scientists in the performance of their professional duties. Using a 5-point scale, participants rated the importance of NASA technical reports 3.51.

Factors Affecting Use of NASA Technical Reports

The relevant literature overwhelmingly favors accessibility as the single most important determinant of use. It is, therefore, hypothesized that the influence of accessibility on use would also apply to NASA technical reports. Participants who use them were asked to indicate the extent to which seven factors influenced the use of NASA technical reports. Overall, relevance exerts the greatest influence on the use of NASA technical reports. Technical quality or reliability, followed by accessibility exerts the greatest influence on the use of NASA technical reports.

Information-Seeking Behavior and NASA Technical Reports

Participants were asked if they had used NASA technical reports to complete their most recent technical project, task, or problem. Next, these same participants who used them were asked how they found out about NASA technical reports. Approximately 65% of the participants indicated that they had used NASA technical reports to complete their most recent technical project, task, or problem. In completing their most recent technical project, task, or problem, participants used their personal collection of information first, followed by discussions with a co-worker or key individual in their organization. Next, they searched the library or a database and, asked a librarian.

RESULTS OF THE READER PREFERENCE SURVEY CONCERNING NASA LANGLEY RESEARCH CENTER TECHNICAL REPORTS

To learn more about the preferences of U.S. aerospace engineers and scientists concerning the format of NASA Langley Research Center-authored technical reports, we surveyed 133 report producers (i.e., authors) and 137 report users in 1993 and 1994 using mail (self-reported) questionnaires. The response rates for report producers (i.e., authors) was 68% and for users was 62%. Questions covered such topics as (a) the order in which report components are read, (b) components used to determine if a report would be read, (c) those components that could be deleted, (d) the placement of such components as the symbols list, (e) the desirability of a table of contents, (f) the format of reference citations, (g) column layout and right margin treatment, and (h) and person and voice.

Order in Which Users Read or Review Report Components

Survey respondents were asked to use the technical report provided and to number a list of report components to indicate the chronological sequence in which these components are gen-

erally read. The question as it appeared in the questionnaire is shown below. The format for a typical NASA LaRC technical report appears below. Please number IN ORDER, the components you generally read/review. (For example, if you read the "ABSTRACT" first, number it with a "1." Do not number those components you skip.

- | | |
|---|---|
| a. ☐ Title Page | i. ☐ Description of Research Procedure |
| b. ☐ Foreword | j. ☐ Results and Discussion |
| c. ☐ Preface | k. ☐ Conclusions |
| d. ☐ Contents | l. ☐ Appendixes |
| e. ☐ Summary | m. ☐ References |
| f. ☐ Introduction | n. ☐ Tables |
| g. ☐ Symbols List | o. ☐ Figures |
| h. ☐ Glossary of Terms | p. ☐ Abstract |

Table 1 shows, for each component, the percentage of survey respondents who indicated they read that component at some stage in the use sequence. The report components are listed in descending frequency of use. For the *internal* respondents, the components read by the highest percentage of readers were the results and discussion and the conclusions. Other components read by more than 80% of the internal respondents were the introduction, description of the research procedure, and the title page. For the *external* respondents, the components read by the highest percentage of readers were the conclusions and the summary. Other components read by more than 80% of the external respondents were the title page and the abstract. Components read by 80% of both groups were the conclusions (94.7%), results and discussion (87.6%), introduction (83.1%), title page (82.5%), and the summary (82.2%). Conversely, certain components were read by very few respondents in either survey group. The foreword and preface had very low usage rates: *internal* respondents 15.9%/15.2 and *external* respondents 38.9%/32.9%. (With the exception of NASA Special Publications, NASA LaRC technical reports generally do not include a foreword or preface.) Other components read by less than half of both groups include the glossary of terms (29.1%) and the symbols list (37.5%).

To clarify sequence of use of report components, a weighted average ranking was calculated and is presented in Table 2. Weighted average rankings were used to determine the order of use of the 16 report components. The weighted average rankings were obtained by assigning weights based on specific order of use. A weight of 16 was assigned for the component read first, 15 for components read second, decreasing sequentially to 1 for components read sixteenth. The weighted was calculated by the formula

$$\frac{\sum n_i w_i}{n_i}$$

where n_i was the number of users reading a component in the "ith" position, w_i was the weight assigned for the "ith" position, and n_i was the total number of users who read that component in any position.

When both groups were combined, the resulting mean sequence for the first six components read was title page, abstract, summary, introduction, conclusions, and table of contents. Examined separately, the internal and external groups showed the exact overall patterns in sequential positions. Although the abstract appears on the last page of a NASA report, this component was read by about 74% of the internal and 82% of the external respondents. Moreover, the abstract was the second report component read by both report producers and users.

Table 1. Percentage of Survey Respondents Who Read Various Langley-Authoring Technical Report Components

Internal Survey (n = 137)		External Survey (n = 133)		Combined Surveys (n = 270)	
Component	Percentage who read	Component	Percentage who read	Component	Percentage who read
Title page	81.6	Title page	83.3	Title page	82.5
Abstract	74.3	Abstract	82.0	Abstract	78.2
Introduction	90.3	Introduction	75.8	Introduction	83.1
Table of contents	43.6	Table of contents	59.9	Table of contents	51.8
Conclusions	94.7	Conclusions	94.6	Conclusions	94.7
Foreword	15.9	Foreword	38.9	Foreword	27.4
Results and discussion	95.5	Results and discussion	79.6	Results and discussion	87.6
Description of research procedure	84.5	Description of research procedure	59.3	Description of research procedure	71.9
Preface	15.2	Preface	32.9	Preface	24.1
Figures	79.4	Figures	62.3	Figures	70.9
Symbols list	47.3	Symbols list	27.7	Symbols list	37.5
Glossary of terms	31.9	Glossary of terms	26.2	Glossary of terms	29.1
Tables	63.3	Tables	50.2	Tables	56.8
References	63.3	References	49.5	References	56.4
Appendixes	62.6	Appendixes	39.7	Appendixes	51.2
Summary	79.4	Summary	85.0	Summary	82.2

Table 2. Weighted Average Ranking: Order in Which LaRC-Authored Technical Report Components Are Read

Internal Survey (n = 137)			External Survey (n = 133)			Combined Surveys (n = 270)		
Component	n	Weighted avg. rank*	Component	n	Weighted avg. rank*	Component	n	Weighted avg. rank*
Title page	113	15.8	Title page	112	15.6	Title page	225	15.7
Abstract	103	14.5	Abstract	109	13.9	Summary	223	14.2
Summary	110	13.5	Introduction	102	12.2	Abstract	212	13.5
Introduction	125	12.4	Table of contents	77	10.8	Introduction	227	12.3
Conclusions	131	11.5	Conclusions	127	11.3	Conclusions	258	11.4
Table of contents	61	11.4	Foreword	53	10.5	Table of contents	138	11.1
Description of research procedure	117	10.7	Results and discussion	107	10.6	Foreword	239	10.5
Results and discussion	132	10.4	Description of research procedure	80	10.0	Description of research procedure	197	10.4
Figures	110	10.0	Preface	45	9.4	Figures	194	9.8
Symbols list	66	8.4	Figures	84	9.5	Results and discussion	76	9.7
Tables	88	7.9	Symbols list	38	6.5	Preface	67	8.5
References	88	7.8	Glossary of terms	36	5.6	Tables	156	8.0
Foreword	23	7.8	Tables	68	8.2	Symbols list	104	7.6
Appendixes	45	6.6	References	67	6.6	Glossary of terms	155	7.3
Glossary of terms	88	6.5	Appendixes	54	6.0	References	141	6.7
Preface	22	6.5	Summary	113	13.5	Appendixes	81	6.1

*Highest number indicates component was read first; lowest number indicates component was read last.

Components Reviewed or Read to Determine Whether to Read the Full Report

The respondents were asked to indicate which report components (up to five) were used to decide whether to read the report. Respondents were asked to indicate the order in which these components were read. Table 3 lists the five components most frequently used by survey respondents in reviewing reports for possible reading and the percentage use by each group. Respondents from both groups identified the abstract (71.6%/67.7%) as the component most often reviewed to determine if a report would actually be read. The summary (65.7%) was the component utilized second (most often) by the respondents to the internal respondents as a screening tool. The conclusions (57.9%) was the component utilized second (most often) by the respondents to the external respondents as a screening tool. *Internal* respondents indicated the summary, title page, conclusions, and introduction (listed decreasing frequency of use) as the components most often reviewed to determine if a report would actually be read. *External* respondents indicated the conclusions, title page, summary, and introduction (listed decreasing frequency of use) as the components most often reviewed to determine if a report would actually be read.

Table 3. Components Most Commonly Used to Review/Read
LaRC-Authored Technical Reports

Component	Percentage of respondents indicating use of a report component	
	Internal Survey n = 137	External Survey n = 133
Abstract	71.6	67.7
Summary	65.7	47.7
Title Page	57.7	57.2
Conclusions	54.9	57.9
Introduction	36.7	34.0

Table 4 gives a weighted average ranking for order of use of the five components most frequently reviewed in deciding whether to read a report. This table shows that the most common sequence used by combined surveys was: title page, abstract, summary, introduction, and conclusions. The use pattern for both internal and external groups was the same as that for the combined surveys (i.e., both producers and users).

Report Components Which Could Be Deleted

Survey respondents were asked to list any NASA Langley-authored report components (up to five) that could be deleted. The most dispensable components were thought to be the foreword and preface by both survey groups. About 70% and 64% of the internal respondents suggested deleting the preface and foreword, respectively. About 39% and 38% of the external respondents suggested the foreword and the preface as components that could be deleted. About 23% of the internal respondents indicated deleting the table of contents. On the other hand, only about 5% of the external respondents suggested that the table of contents could be deleted.

Table 4. Weighted Average Ranking: Order in Which Components Are Reviewed in Deciding Whether to Read a LaRC-Authored Technical Report

Internal Survey (n = 137)			External Survey (n = 133)			Combined Surveys (n = 270)		
Component	n	Weighted avg. rank*	Component	n	Weighted avg. rank*	Component	n	Weighted avg. rank*
Title page	113	15.8	Title page	112	15.6	Title page	225	15.7
Abstract	103	14.5	Abstract	109	13.9	Abstract	212	14.2
Summary	110	13.5	Summary	113	13.5	Summary	223	13.5
Introduction	125	12.4	Introduction	102	12.2	Introduction	227	12.3
Conclusions	131	11.5	Conclusions	127	11.3	Conclusions	258	11.4

*Highest number indicates component was read first; lowest number indicates component was read last.

Desirability of a Table of Contents

Survey participants were asked a question concerning the need for and or desirability of a table of contents in NASA Langley-authored technical reports. Summaries of the results from the internal and external respondents are given in Table 5.

Table 5. Opinions of Respondents Concerning the Desirability of a Table of Contents in All LaRC-Authored Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
Yes, all should	21.2	29	53.4	75
No, only long reports need it	78.8	108	46.6	58

About 21% of the internal respondents indicated that all NASA Langley-authored technical reports (regardless of length) should contain a table of contents; however, of the external respondents, 53.4% expressed the need for a table of contents in all NASA Langley-authored technical reports. Thus, although about 79% of the internal respondents indicated that only long reports need a table of contents, about twice as many (53.4%) external (non-NASA Langley) respondents expressed the desire for this component in all NASA Langley-authored technical reports than did their internal counterparts.

Desirability of a Summary in Addition to an Abstract

Respondents were asked a question concerning the need for a summary (appearing in the front) in addition to the abstract, which appears as back matter on the Report Documentation

Page (RDP) of NASA Langley-authored technical reports. Summaries of the results obtained from the internal and external respondents are given in Table 6. Internal respondents were about evenly divided about whether the more detailed summary should be included in NASA Langley-authored technical reports in addition to the abstract. A slight majority (50.4%) favored inclusion

Table 6. Opinions of Respondents Concerning the Desirability of a Summary in Addition to an Abstract in All LaRC-Authoring Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
Yes, include a summary, too	50.4	69	60.2	80
No, don't bother with it	49.6	68	39.8	53

of both components. Among external respondents, however, 60.2% indicated that NASA Langley-authored technical reports should have a summary in addition to an abstract.

Location of the Definition of Symbols and Glossary of Terms

Survey respondents were asked to indicate where in a NASA Langley-authored technical report the definition of symbols and glossary of terms components should appear. Summaries of the results from the internal and external respondents are given in Tables 7 and 8.

Table 7. Opinions of Respondents Concerning the Location of the Symbols List in LaRC-Authoring Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
After Contents	10.2	14	25.6	34
After Introduction	39.4	54	10.5	14
As an Appendix	13.9	19	19.5	26
Near front of report AND where symbols appear	15.3	21	20.3	27
Near back of report AND where symbols appear	5.8	8	10.5	14
NO Symbols List needed; just define the symbol where it appears in the report	15.3	21	13.5	18

Concerning the location of the Symbols List, the response patterns from the internal and external respondents were different. The largest percentage of internal (39.4%) and external (25.6%) respondents chose the response, "after Introduction" and "after Contents." The second highest percentages of both groups (15.3%) and (20.3%) chose "near front of report AND where

symbols appear." Thus, when results from these two responses were combined, a preference (64.9% for internal respondents and 56.4% for external respondents) was evident for the Definition of Terms to be located near the front of the report as opposed to being located as back matter.

Regarding the location of the Glossary of Terms, the response patterns from the internal and external respondents were different. The largest percentage of the internal (46.7%) respondents selected "no glossary of terms needed; just define the term where it appears in the report." The largest percentage of external respondents (30.8%) chose the response, "as an Appendix." The second highest percentage (24.8%) of the internal respondents and external respondents (15%) chose "after Contents." Thus, when results from these two responses were combined, a preference (32.1% for internal respondents and 43.6% for external respondents) was evident for the glossary of terms to be located near the back of the report as opposed to being located as front matter.

Table 8. Opinions of Respondents Concerning the Location of the Glossary of Terms in LaRC-Authored Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
After Contents	4.4	6	15.0	20
After Introduction	7.3	10	3.8	5
As an Appendix	24.8	34	30.8	41
Near front of report AND where terms appear	9.5	13	11.3	15
Near back of report AND where terms appear	7.3	10	12.8	17
NO Glossary of Terms needed; just define the term where it appears in the report	46.7	64	26.3	35

When Appendix Material Is Read

Survey respondents were asked a question concerning when they read appendix material—before, with, or after the text. Summaries of the results from the internal and external respondents are given in Table 9. The internal and external responses were very similar. A strong majority (73% internally and about 77% externally) indicated that the appendixes were read after the text. About 25% of the internal respondents and about 23% of the external respondents stated that the appendixes were read with the text. About 2% of the internal and 0.0% of the external respondents indicated that the appendix material was read prior to reading the text.

Location and Use of Illustrative Material

Internal and external respondents were asked three questions concerning the location and use of illustrative material (such as tables, graphs, and photographs) in NASA Langley-authored

technical reports. A summary of the results from the internal and external respondents is presented in Tables 10, 11, 12, and 13.

Table 9. When Respondents Usually Read Appendix Material in LaRC-Authoring Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
Before the text	2.2	3	0.0	0
With the text	24.8	34	23.3	31
After the text	73.0	100	76.7	102

About 47% of the internal and about 36% of the external respondents indicated that a list of figures or tables should ONLY be included in NASA Langley-authored technical reports when there is a lot of illustrative material (e.g., over 10 figures, photos, or tables). About 34% of the internal respondents and about 29% of the external respondents reported that "No List of Figures and Tables Needed" in NASA Langley-authored technical reports. About 22% of external respondents indicated that NASA Langley-authored technical reports should always contain a list of figures or tables whenever a report contains illustrative material.

Table 10. Opinions of Respondents Concerning the Need for a List of Figures or Tables in LaRC-Authoring Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
Only when illustrative material is integrated with the text	4.4	6	6.8	9
Only when illustrative material is separate from the text; at the end of the report	5.8	8	6.0	8
Only when there is a lot of illustrative material (e.g., over 10 figures, photos or tables)	47.4	65	36.1	48
Always; whenever a report contains illustrative material	8.0	11	21.8	29
No List of Figures and Tables needed	34.3	47	29.3	39

Internal and external respondents were asked about the integration of illustrative material as opposed to group it at the end of the report (Table 11). The survey results show that about 77% of the internal and about 80% of the external respondents preferred that the illustrative material be integrated with the text as opposed to being grouped in the back matter.

Table 11. Opinions of Respondents Concerning Integration of Illustrative Material as Opposed to Grouping It At the End of NASA LaRC-Authored Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
Integrated with text	77.4	106	79.7	106
Separate from text; at end of report	22.6	31	20.3	27

Table 12 contains the responses to the third question concerning the placement of illustrative material. About 31% of the internal and about 50% of the external respondents indicated that integration of tables and figures did not interrupt their reading no matter how much illustrative material the report contained. The illustrative-page/text-page ratio which interrupted reading was placed at two by about 49% of the internal respondents and about 35% of the external respondents; at three by about 14% of internal and 9% of external respondents; and at four or more by about 6% of internal and 6% of external respondents.

Table 12. Opinions of Respondents Concerning the Amount of Illustrative Material That Can be Integrated with the Text of LaRC-Authored Technical Reports Without Interrupting the Reader

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
Yes, when there are two pages of illustrative material for every page of text	48.9	67	35.3	47
Yes, when there are three pages of illustrative material for every page of text	13.9	19	9.0	12
Yes, when there are four or more pages of illustrative material for every page of text	5.8	8	6.0	8
No, I always prefer to have illustrative material integrated in text	31.4	43	49.6	66

Finally, respondents were asked when they read the illustrative included in NASA Langley-authored technical reports. Summaries of the internal and external responses are presented in Table 13.

Table 13. When Respondents Usually Read Illustrative Material in LaRC-Authored Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
Before the text	16.8	23	18.0	24
With the text	80.3	110	79.7	106
After the text	2.9	4	2.3	3

Most respondents (80.3% internally; 79.7% externally) indicated that the illustrative material was read with the text. Some respondents (16% internally and 18% externally) indicated that the illustrative material was read before the text. Only a few respondents (4% internally and 2.3% externally) indicated that the illustrative material was read after the text.

Format of Reference Citations

Survey respondents were asked to specify their preference between three formats for reference citations in NASA Langley-authored technical reports. Summaries of the internal and external respondents' responses are presented in Table 14.

Table 14. Preferences of Respondents Concerning the Format of Reference Citations Used in LaRC-Authored Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
Cited in text by author/year (e.g., Jones 1978) but with an alphabetic list in back of report	27.7	38	27.8	37
Cited in text by number (e.g., reference 16) with a numbered list in back of report	52.6	72	55.6	74
Cited in text by footnote (e.g., Jones ¹²) with a numbered list in back of report	19.7	27	16.5	22

About 53% of the internal respondents and about 56% of the external respondents preferred references in the text to be cited by number (e.g., reference 16) with a numbered list in back of report. About 28% of the internal respondents and about 28% of the external respondents preferred references cited in text by author/year (e.g., Jones 1978) but with an alphabetic list in back of report. About 20% of the internal respondents and about 17% of the external respondents preferred references cited in text by footnote (e.g., Jones¹²) with a numbered list in back of report.

Specifications of Units for Dimensional Values

Respondents were asked to specify their preferences regarding the use of the International System (S.I.) units and U.S. Customary units for dimensional values in NASA Langley-authored technical reports. Table 15 contains the results of the survey responses concerning this question.

Table 15. Preferences of Respondents Concerning Units for Dimensional Values Specified in LaRC-Authored Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
The International System (S.I.) units (e.g., meter, kilogram)	24.1	33	26.3	36
U.S. Customary units (e.g., foot, pound)	38.0	52	22.6	30
S.I. units with U.S. Customary units in parentheses	15.3	21	18.8	25
U.S. Customary units with S.I. units in parentheses	22.6	31	32.3	42

There was no overall agreement among either survey groups as to how dimensional values should be specified in NASA Langley-authored technical reports. Thirty-eight percent of the internal respondents selected U.S. Customary units (e.g., foot, pound) followed by the International System (S.I.) units (24.1%), and U.S. Customary units with S.I. units in parentheses (e.g., meter, kilogram) (22.6%). About 32% of the external respondents selected U.S. Customary units with S.I. units in parentheses, followed by the International System (S.I.) units (e.g., meter, kilogram) (26.3%), and U.S. Customary units (e.g., foot, pound) (22.6%).

Column Layout and Right Margin Treatment

Respondents were asked to state their preferences concerning one or two column layouts and ragged or justified right margins. Table 16 summarizes the results of survey respondents. About 41% of the internal respondents preferred two columns; justified right margin, followed by a mixed format; one and two columns intermixed as mathematical material dictates (21.2%). About 34% of the external respondents preferred one column; justified right margin followed by two columns; justified right margin (24.1%). Overall, a two column format (48.9%) was preferred by internal respondents and a one column format was preferred by external respondents (51.1%). Justified right margins were preferred over ragged right margins by about 53% of the internal respondents and about 63% of the external respondents.

Table 16. Preferences of Respondents Concerning Column Layout and Right Margin Treatment in LaRC-Authoried Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
Two columns; justified right margin	40.9	56	24.1	32
Two columns; ragged right margin	8.0	11	6.0	8
One column; justified right margin	12.4	17	33.8	45
One column; ragged right margin	17.5	24	17.3	23
Mixed format; one and two columns intermixed as mathematical material dictates	21.2	29	18.8	25

Person and Voice

Survey respondents were asked to specify their preference in regard to person and voice in NASA Langley-authored technical reports. Table 17 summarizes the results of the internal and external respondents.

Table 17. Preferences of Respondents Concerning Person and Voice for LaRC-Authoried Technical Reports

Response	Internal respondents (n = 137)		External respondents (n = 133)	
	%	n	%	n
Passive voice, third person	64.2	88	47.4	63
Active voice, third person	14.6	20	17.3	23
Active voice, first person	21.2	29	35.3	47

Among both groups, the passive voice, third person option was chosen most often as the preferred writing style. Among internal respondents, about 64% selected this preference. Among external respondents, about 47% selected this preference. Considering voice alone, internal respondents preferred the passive voice (64%) over the active voice (35%). On the other hand, external respondents preferred the active voice (53%) over the passive voice (47%).

The majority of both internal (78.8%) and external (64.7%) respondents preferred that third person be used rather than first person in NASA Langley-authored technical reports. It should be noted, however, that a higher percentage of external respondents (35.3%) preferred first person than did the internal group (21.2%).

CONCLUDING REMARKS

Recognition of the importance of knowledge as an asset and a source of competitive advantage is driving organizations to find ways of optimizing and managing this resource. Under the general rubric of "knowledge management," organizations in the private and public sectors have begun exploring methods for creating and deriving value from explicit and tacit organizational knowledge resources. Although there is no single, agreed-upon approach to the practice, knowledge management, in general, encompasses a variety of strategies, methods, and technologies for leveraging the intellectual capital and know-how of organizations for competitive advantage. In brief, the practices associated with knowledge management include identifying and mapping both the tacit and explicit knowledge of organizations; importing potentially useful knowledge from the external environment; making relevant knowledge available to users in forms that best meet their knowledge requirements; winnowing and filtering out unnecessary or irrelevant information; creating new knowledge that can provide competitive advantage; sharing the best methods and practices for completing knowledge-based work; and applying strategies, techniques, and tools that support the foregoing activities.

Sources of knowledge external to an organization are often critical to the innovation process and to the commercial success of various products, including large commercial aircraft. Studies have proved this statement true for entire nations (e.g., Japan) and for entire industries (e.g., computers). [At the organizational level, the results of studies suggest that most innovation results from knowledge that resides external to the organization. Ergo, the ability of organizations to exploit external knowledge is critical to technological innovation and R&D.] Several factors affect an organization's capacity to absorb knowledge, assimilate it, and apply it to commercial ends. Several factors affect an organization's capacity to absorb knowledge, assimilate it, and apply it to commercial ends. [For example, organizations that conduct their own (internal) R&D are better able to absorb external knowledge than are those organizations that do not.] It appears that experience, at both the organizational and individual levels, with similar or related knowledge, determines in large part an organization's ability to evaluate, absorb, and utilize external knowledge.

[The technical report] is a primary means by which the results of federally funded R&D are made available to the U.S. aerospace community. [The history of technical report literature in the U.S. coincides almost entirely with the development of aeronautics and the aviation industry. The boundaries of technical report literature are difficult to establish because of wide variations in the content, purpose, and audience being addressed. Their formats vary; they might be brief (two pages) or lengthy (500 pages). They appear as microfiche, computer printouts or vugraphs, and often they are loose leaf (with periodic changes that need to be inserted) or have a paper cover, and often contain foldouts. Their contents may include statistical data, catalogs, directions, design criteria, conference papers and proceedings, literature reviews, or bibliographies. Technical reports permit prompt dissemination of data results on a typically flexible distribution basis; they can convey the total research story, including exhaustive exposition, detailed tables, ample illustrations, and full discussion of unsuccessful approaches and their distribution can be limited or restricted. Therefore, technical report collections constitute an important part of an organization's intellectual assets. Nevertheless, the body of available knowledge is simply inadequate to determine the role that the technical report plays in the diffusion of knowledge in the U.S. aerospace industry.]

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Grey Literature as a Segment of the Market of Scientific and Technical Information Services in Latvia

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Abstract

Provision of grey information as a component of unified Latvian information market is described. Estimation of information market and principles of information provision are adduced. Significance of participation in international grey information systems for Latvian research is analyzed.

1. INFORMATION SERVICES AS THE KERNEL OF NATIONAL INFORMATION POLICY

Free circulation of information and general its availability is a precondition and a tool for democratic development of any country on its way towards the information society [1, 2]. It is the state's obligation to ensure distribution of information and an easy and inexpensive access to well-developed information services for everyone, to avoid any discrimination between *information rich* and *information poor*.

Processing of various kinds of information, provision of information services should be considered as the main components of the originated National Information Programme for Latvia [3] as for any country, but the concept of so-called *universal information service* -- as its cornerstone. The term appeared in the field of telecommunications, but at present we understand under universal service also the availability of information content to which everyone has the right of access [4]. Usually this term is defined as containing a long-time uninterrupted information service of a defined quality for everyone without any discriminations, e.g., of disadvantaged groups (people with disabilities, elderly people, etc.) or remote regions at a reasonable price.

A number of other tenets of the Programme -- harmonization of legal and regulatory framework, development of telecommunications and networking services, creation of information systems, education and training, R&D in informatics, really should be directed to provision of the basis for the development of information services in the country and to ensuring interoperability of services on international level.

Provision of scientific and technical information is one of the most important components of information services for development of the national economy, research and education. To satisfy increasing information demands of the patrons, to organize really user-oriented advanced information services the Concept of Provision of Scientific and Technical Information for Latvia [5] has been elaborated as a component of the National Information Programme. The basic principles of the Concept were approved by Latvian Academy of Sciences in 1994 and 1997.

Association of Latvian Academic Libraries has adopted the Concept in full in 1997. The Concept conforms to general tendencies of evolution of our country towards the information society.

The Latvian approach imagines realization of qualitative information supply by integrated use of both -- printed and electronic technologies. Electronic media develop rapidly first of all for international information, for information browsing and search. Printed media still dominate for local information and mostly for full text documents. The Concept does not separate various kinds of information, its basic propositions concern equally all information services and sources. Thus provision of grey information also should not be considered as an isolated process, it is an integral and substantial part of common information market that is bound up with strategy of informatization of country.

2. MARKET FOR INFORMATION SERVICES

To elaborate and to develop further an adequate information policy as a whole and its separate components reliable notion on current state of affairs is necessary. Therefore Latvian market for information services, demand and supply of services, their availability and quality as well as prices for them were analyzed by author of current paper in spring 1997 from the point of view of consumers. In contrast to European survey [6], where revenues and other financial indices served as the main criterion of information brokerage, analysis of Latvian market was realized by means of survey of end-users of various information. Representatives of various target groups of people who really use information were involved in the survey. They represent government and academic institutions, state and private enterprises, non-government and public organizations.

In line with the Concept use of various kinds of information were included in the survey. End-users had rated significance of information sources and their providers according to a 6-point scale (5 = very significant, 0 = no significance). The results (see Figure 1) show that end-users for the present more rely on traditional and verified information sources -- books, periodicals and personal contacts, although various electronic information sources gradually occupy Latvian market for information services.

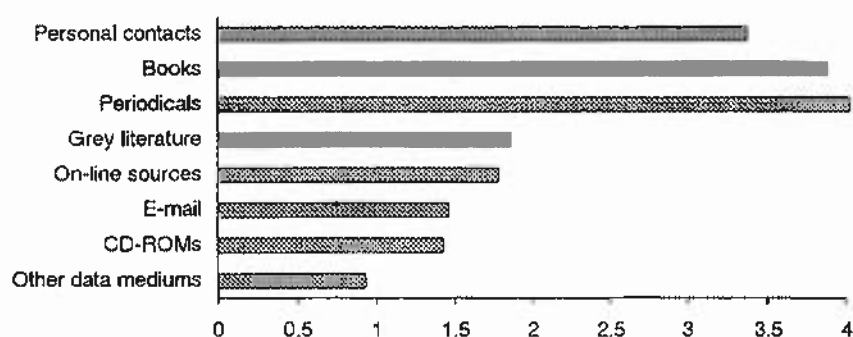


Figure 1. Significance of information sources

As concerns grey information sources, more detail investigation shows that different categories of end-users (managers and civil servants, researchers and information professionals, engineers and cultural artisans, even students) estimate them on quite equal level -- 40-55% of total number of corresponding respondents had mentioned grey information as significant one for them. Physicians and teachers/lecturers are an exception to the general regularity -- less than 20%

of them are using grey literature. Availability and quality of grey information sources were estimated on middle rating, while the price for information was appraised rather as too high.

Analyses of information brokerage and parceling out the market for services between information providers show that libraries remain the main of them (see Figure 2). Especially research libraries as a provider of scientific, technical, technological information, as a source of knowledge are involved deeply in the common process. 97% of all respondents had mentioned libraries as an information brokers which services they use, 89% of them had marked libraries as significant and very significant information institutions. Statistics of use of the major Latvian libraries as well as their services during the last years also show an obvious tendency of increasing necessity of society in information provision [5].

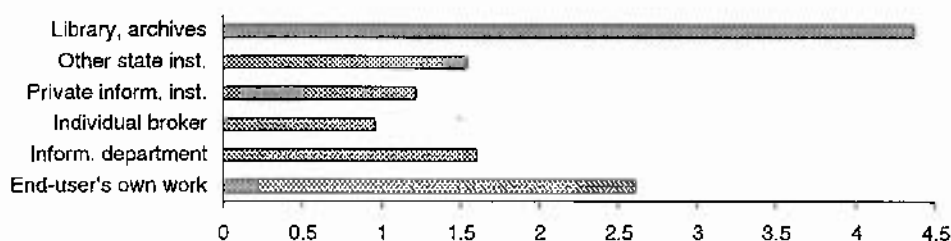


Figure 2. Significance of information brokers

3. PROVISION OF GREY INFORMATION

To satisfy huge demand for information it is necessary to modernize style of work of libraries in accord with today's requirements keeping the main traditional axiom -- to act as an intermediary in the process of information transmission between information source and its end-user. Advanced principles and technologies should be introduced to provide full cycle of information ensuring in any research library -- collection, processing, storage, effective search and users supplying with qualitative information in form they need and wherever and whenever they need. To realize this principle the Concept has been based on several central theses, they are closely related to grey information provision too.

Virtual library strategy is one of the most substantial orientations of the Concept that expands the stock, it is especially important for Latvia as for any small country. Possibility to find any necessary information source, to order and to receive information that is absent on the stock is an important addition to traditional library services. Virtual library is a substantial component of common system when it concerns books or periodicals, it provides more effective information supply.

Grey literature means small editions, this information cannot be collected on your shelves irrespective of your financial possibilities. The content of grey information sources mostly is highly specialized, they would be interesting only for several people, therefore it is not advisable to collect these sources "for any case". Therefore realization of virtual library strategy, information delivery on requests is much more vital for grey information provision as for availability of traditional printed sources. Really it is the single way, only its development made possible wide availability of grey literature.

Development of virtual library strategy, provision of information that is not collected in stocks fully divorces two components of information assimilation from each other -- information

search and its learning. Therefore two tasks must be performed by the library to provide integral service -- provision of global information search and delivery of full texts of necessary documents. Both problems are bound up one with another, the Concept imagines wide use of electronic information technologies to work out them (see Figure 3).

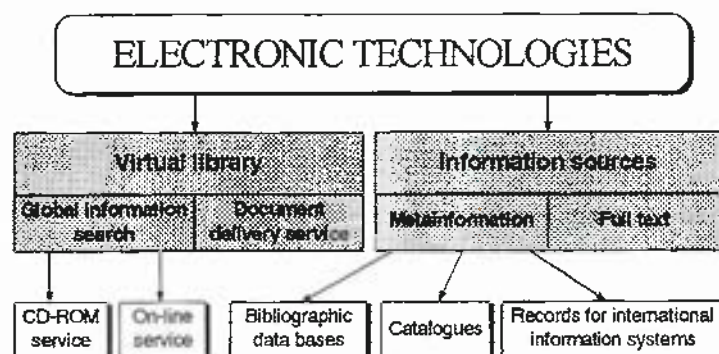


Figure 3. Applications of electronic technologies for grey information supply

Information search by bibliographic data bases and on-line information browsers ensures complete worldwide notion on all available documents. Widespread use of bibliographic data bases really ensures indispensable preconditions for use of document delivery service. On the other hand, the best method of information search is senseless without possibility to receive full texts of documents. Only implementation of integrated service -- computer search of information and document delivery service ensures worldwide information supply. Exactly this strategy is a real way for grey information brokerage.

Creation of various information sources is another substantial part of information services to ensure full information processing cycle and authentic information supply. Preparation and updating of public available information sources in small countries mostly is a prerogative of academic and government institutions, libraries become one of the basic organizations in this sphere too. It concerns also creation of various grey information sources -- full text/image and bibliographic data bases, catalogues, indexes, etc., especially those containing information according to general subjects and regional profile of the library. E.g., the on-line data base *Information Sources in Latvia* that is maintained by Latvian Academic Library (URL: <http://www.acadlib.lv>) contains records on printed and electronic reference sources, the most part of them are grey documents.

4. SIGNIFICANCE OF PARTICIPATION IN EAGLE

One more task is inclusion of the information on Latvia in worldwide information systems, libraries are taking part in this process too. E.g., the Fundamental Library of Latvia University of Agriculture is the National Centre of United Nations agricultural data base system AGRIS/CARIS. Latvian Academic Library as the representative of Latvia in European Association for Grey Literature Exploitation EAGLE realizes data entry in grey literature data base SIGLE.

Bibliographic data base SIGLE is the most popular information product of EAGLE, but it is not the single its information service (see Figure 4). Under the Statutes of EAGLE each its National Centre should provide delivery of grey documents to customers, it is not less important

service than provision of information search by means of SIGLE. Thus really EAGLE provides both parts of virtual library integral service, it is the characteristic and very important advantage of Association's activities that fully corresponds to the Latvian Concept.

Really the overwhelming majority of scientific, technical, technological publications in Latvia are on grey literature status taking into account the editions of publications as well as small and poorly developed information market. Preprints, proceedings of conferences, dissertations, research and technical reports, even brochures and monographs are among them, they contain information on results of fundamental and applied investigations, on development of advanced technologies. Usually it is the first publication of results of research that sometimes will never be repeated. Their advantage -- operative publication, advanced electroreprographic technologies allow printing small editions (up to 400-600 copies) in a short time without masters, the accents usually are put on the content. As a result these documents are not wide available.

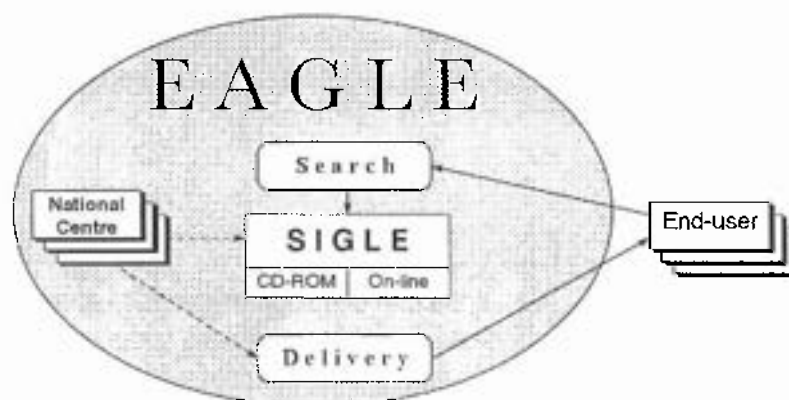


Figure 4. Integrated service provided by EAGLE

But Latvian researchers should introduce themselves to international academic community too, especially it concerns the young generation. Leaders of our research are popular in the Western world, but Latvian science as a whole is not very known till today. Results of Latvian research should be presented in the international scientific information sources. Worldwide distribution of this information is exceptionally important for Latvian researchers to integrate in European Union and global research programmes, to establish wide partnership with Western colleagues, to obtain innovations for further investigations. But publication in the international scientific journals as well as publication of monographs by leading publishing houses really in many cases are hampered at present. Situation was mentioned as a problem in [7], there are no material changes till today. As a result publications of our researchers are not reviewed in international bibliographic information systems that have become the main source for information search today.

Possibility to break this exclusive circle, to present results of investigations on international level by means including of records on grey publications in data base SIGLE is very important for us. For above-mentioned reasons it is much more vital for our country (and for other CEEC too) than for Western countries. In addition democratic principles of data entry in SIGLE leave exactly to us the decision what publication should be reviewed.

Therefore Latvian Council of Sciences recommended Latvian Academic Library as a universal research library and the main scientific information institution for representation of Latvia in EAGLE. Under the law of Latvia the Library receives legal copies of grey documents published in our country. LAL employees have a long-time experience in creation of bibliographic indexes and data bases.

Data entry was started a year ago, at present SIGLE contains more than 600 records on Latvian grey information sources. We are planning retrospective data entry too, grey documents that were published since 1990 will be reviewed. Taking into account significance of grey information segment in Latvian market for information services further development of these services is necessary.

We should extend themes of reviewed grey documents. Latvian Technological Center and its tenant firms, FEMIRC Latvia, Latvian Development Agency, World Trade Center Riga, European Integration Bureau, Latvian Privatization Agency are publishing many technological, business, financial and reference information.

Another trend is collection and reviewing of electronic grey information sources. Research, government, business, financial institutions are publishing lot of grey electronic documents mostly on their WWW sites. It becomes more and more popular to provide information on conferences, exhibitions and trade fairs; scientific, technical, financial reports; bibliographies; abstracts of publications; press releases; yearbooks; wide reference information in electronic form. Especial server for processing and storage of electronic grey publications would be installed in the Library.

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GL'97 International Conference

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**ACCESS TO MULTICULTURAL/MULTIETHNIC GREY LITERATURE:
A NETWORKED APPROACH**

African American Resources

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The 2nd International Conference on Grey Literature (GL'95) focused on the explosion of grey data produced by ongoing improvements and innovations in electronics, telecommunications, and informatics. Multicultural or multiethnic grey literature was also introduced and defined at GL'95. Participants at the Conference were urged to expand their concept of grey literature to include providing access to materials produced in this new electronic medium. They were also encouraged not to overlook the rich, resource value of multicultural or multiethnic grey literature.

At GL'95, multicultural or multiethnic grey literature was defined as material that clarifies and details the diversity of experiences of cultures and/or ethnic groups and is not normally available through commercial publication sources (Evans, 1996, p.85). This includes reports, theses, and printed ephemera. Quite often it is this body of literature that will serve to authenticate and document the history of human societies and nations. However, to fully appreciate the value of these materials, they must be located, organized and made accessible to the specific cultural communities and the public at large. This presentation is a continuation of the GL'95 discussion on multicultural grey literature.

The purpose of this paper is twofold. First, the goal is to advance the notion of multicultural grey literature. More specifically, to challenge this group to broaden its view of grey literature to include materials beyond scientific and technical reports. Secondly, to build upon the study presented by Inge de Heer and Dominic Farace at GL'95. Those authors stated that even

though the Internet is still developing and chaos reigns, it can be a valuable asset for the organization and redistribution of grey literature (de Heer and Farace, 1996, p. 247). This is certainly true, for despite the freewheeling culture of the Internet, it is a microcosm of our society; and new technologies do present a wealth of opportunities for the management and redistribution of multicultural grey literature.

Therefore, the next logical step is to identify and profile projects and products that serve to make these material(s) available and accessible via the World Wide Web (WWW). As with GL'95, grey literature in the African American community will serve as a model. The hope is that this model will serve to encourage others to explore multicultural grey literature in their own communities.

IMPORTANCE OF MULTICULTURAL GREY LITERATURE

While we have chosen to showcase selected sites on the WWW, for specific communities, we are certainly not pioneers in advocating the importance of multicultural grey literature or culturally related materials. Probably no group has worked more diligently to achieve the reality of a networked cultural heritage than the US-based, National Initiative for a Networked Cultural Heritage (NINCH). This is evident in their mission statement which in part states:

"NINCH is a diverse coalition of cultural organizations dedicated to ensuring the greatest participation of all parts of the cultural community in the digital environment. Our vision of a networked cultural heritage is of an integrated, distributed body of cultural material, in which connections can easily be made between texts and other objects, that is widely accessible on the global information infrastructure. It would be seamlessly interoperable across many media, of the highest possible quality and fidelity, and easily usable and searchable--by creators, scholars, the general public and by teachers and learners of all ages."

<<http://www-nich.cni.org/organization/Mission.html>>

The mission statement goes on to say that "NINCH's goal is the creation of an environment in which people and institutions everywhere can network their cultural resources and receive encouragement and support in doing so" (<http://www-ninch.cni.org/organization/Mission.html>).

Also to be underscored, the Library of Congress, in partnership with the Ameritech Foundation has teamed together to digitize historically significant American collections and make them available for the first time via the Internet. The \$2 million gift from the Ameritech Foundation has made it possible for the Library of Congress to present awards totaling \$600,000 to ten libraries across the United States to digitize their collections of American historical societies, for inclusion in American Memory, the Library of Congress's on-line collection of primary source materials in United States history and culture (<http://www.loc.gov/>).

More recent ventures include the Networked Digital Library of Theses and Dissertations (NDLTD) project at Virginia Polytechnic Institute. The school now requires graduate students to make their masters' theses and doctoral dissertations available on the Internet (<http://etd.vt.edu>). The University is slated to receive a grant of \$210,000 over the next three years from the United States Department of Education, to create a national digital archive of dissertations. At least 12 other universities have agreed to join the initiative.

These organizations have banded together to advocate the importance of multicultural grey literature in fear that the materials will become so grey, until they are invisible. Therefore, the aim of these groups and the focus of this presentation are probably best articulated by the following statement from the Task Force on Archiving of Digital Information:

Society of course has a vital interest in preserving materials that document issues, concerns, ideas, discourse and events. We may never know with certitude how many children Thomas Jefferson fathered or exactly how Hitler died. However, to understand the evils of slavery and counter assertions that the Holocaust never happened, we need to ensure that documents and other raw materials, as well as accumulated works about

history survive so that future generations can reflect on and learn from them.

"Preserving Digital Information." Report of the Task Force on Archiving of Digital Information. Commissioned by The Commission on Preservation and Access and the Research Libraries Group, May 1, 1996, p. 1

Multicultural Grey Literature in the Black Community

"The true test of the progress of a people is to be found in their literature."

--Daniel Alexander Payne Murray

(Cited in <http://lcweb2.loc.gov/ammem/aap/aaphome.html>)

Again, the focus of this paper is on the cooperation and sharing of developmental efforts in the creation of "front end" information access tools, and the development of documentation to ensure the widest distribution of multicultural grey literature in the African American community. This presentation is not meant to be an exhaustive study, nor is it a comprehensive listing of Internet sites on black culture. Rather, the resources selected have been chosen not only because they convey important information, but also because they serve as useful models for other cultural and ethnic groups.

Moreover, our aim is also to dispel the myth that the Internet is "absent of color" and that there is no black presence on the Web. The truth in fact is that there has been an explosion of content on the Internet related to black culture, and there are literally hundreds of on-line resources for and by people of color. The on-line resources run the gamut of Web sites on historically black colleges and universities, to information on minority scholarships, black church burnings, community news and updates, and census data. A number of reputable and longstanding black organizations and associations, such as the National Association for the Advancement of Colored People (NAACP) and the United Negro College Fund (UNCF), have now developed web sites. Many black museums and archival and research centers are digitizing their collections and making them available on-line.

These cultural and community groups in the African American community see the Web as a more affordable way of communicating

information to a large, more diverse body. Moreover, to black entrepreneurs, the Web presents the opportunity for African Americans to create new technology and to become producers of information as well as consumers.

In locating multicultural grey literature on the WWW in the black community, there emerged a number of recurring themes and patterns. Most of the on-line resources were end-products in the form of networked databases or CD-ROM products. The resources invariably fall into three distinct categories; and therefore will be listed here as such. The categories are: academic-related, commercial, and government-related projects. The academic-related sites are materials which were developed at a university or college, more often with financial funding from government or commercial sources. The commercial sites were of course developed as income-producing ventures. The government-related products were usually joint or independent ventures developed by a government or government-sponsored association or organizations.

The following is an annotated listing, which includes both networked, commercial CD-ROM products and web sites. Some sites serve to link users with source information, while others are the source themselves. The resources are listed alphabetically within the three categories. Where appropriate, the URL for the web page is also included.

***Selected Listing of WWW Multicultural Grey Literature
African American Resources***

Academic-Related

Harvard University.

Harvard Guide to African American History - The W. E. B. Du Bois Institute is working on an updated version of the classic *THE HARVARD GUIDE TO AFRICAN AMERICAN HISTORY*, published over 40 years ago. The new Guide will be published in an 800-page book by Harvard University Press, and the text will be made available on CD-ROM. [L#anchor1964630](http://web-dubois.fas.harvard.edu/DuBois/Research/SlaveTrade.HTM)

Trans-Atlantic Slave Trade Database - The W. E. B. Du Bois Institute has also developed a database on the Trans-Atlantic slave trade. Cambridge University Press will soon release the database on CD-ROM. The database incorporates records of British, French, Spanish, and Dutch slave traders from 1650-1867. The database details information on crew membership, mortality levels, ship conditions, duration of voyages, the age and sex of the slaves, and the African's resistance to enslavement. The CD-ROM will also contain information on more than 27,000 separate voyages, including the point of origin and the ship's owners. [L#anchor1964630](http://web-dubois.fas.harvard.edu/DuBois/Research/SlaveTrade.HTM)

Mississippi State University. Historical Text Archive - This site is home to AFRIGENAS, a clearinghouse on African American genealogy. The site also has a mailing list, maintains a discussion list and has links to other sites detailing information on black history and culture. [L#anchor1964630](http://www.msstate.edu/Archives/History/USA/Afro-Amer/afro.html)

University of California at Los Angeles (UCLA). Marcus Garvey Papers - This site is based on the University of California's seven-volume publication on Marcus Garvey and the Universal Negro Improvement Association Papers (UNIA). The site chronicles the largest organized mass movement of black people in the United States. At the project's web site, researchers can

view the dust jacket copy, the introduction, and samples of the text in each of the seven volumes. The site also contains a fact sheet on Garvey and his accomplishments, a gallery of images of Garvey and the UNIA movement, and sound files of two brief speeches Garvey gave in 1921.

<<http://www.isop.ucla.edu/mgpp/>>

University of Michigan. AFRI File - This file is a resource of Africana material on-line through the University of Michigan and the Northwestern University Libraries. The file contains more than 111,000 records and is included on Michigan's MIRLYN system under the "Indexes" section. The file is also the basis of the bimonthly publication, JALA, which is received by libraries throughout the world. AFRI contains more than 20 years' worth of records and will be updated with 9,000-10,000 additional entries annually. The database includes the Africana collection of the Library of Congress and 17 universities including Columbia, Yale, and Stanford.

<<http://www.lib.umich.edu/libhome/mirlyn/mirlynpage.html>>

Wayne State University. AFRITECH - This site serves as a scholarly forum for researchers, educators, and graduate students interested in the impact of science and technology on African Americans. Organizers of the site hold annual electronic conferences. The first was held on January 20, 1995. The site also sponsors a listserv discussion group and publishes a quarterly newsletter.

(<http://www.lisp.wayne.edu/afripag.html>)>

Commercial

African-American Population Statistics - This site contains selected tables and graphs reflecting the latest available census data regarding the African American population of the United States. The data are gathered from the Census Bureau and compiled, prepared and presented by Leonard Johnson, III of Thuban Consulting, Inc. Information can be purchased on either diskettes or CD-ROM.

<<http://www.thuban.com/census/index.html>>

African American Resources Newspaper and Magazine Database - This is a searchable on-line index dating from 1991 to the present. The database contains more than 115,000 newspaper and magazine articles from 71 publications. Searching points include name, subject or geographic location. The site is produced by African American Resources Corporation. While database searches are free, a fee is charged for downloading files.
<<http://www.AARC.NET/aarc.html>>

American Visions Society - This organization began in 1983 as a joint venture with its founder, Gary Puckerin, and the Smithsonian Institution. Its membership totals well over 150,000. Its focus is on the preservation and distribution of African American history and culture. Access to the Society's web site is by subscription through CompuServ. The Society publishes a magazine, *American Visions*, which is the official magazine of the African American Museums Association (AAMA). American Visions Society has received a license from Netscape to develop and market an African American Internet Navigator called North Star. North Star is a software program that identifies resources on the Internet that relate to African Americans.
<<http://www.americanvisions.com...sitorCenter/AllAbout/>>

The Britannica Guide to Black History - This is an on-line product, produced by *ENCYCLOPEDIA BRITANNICA*. It covers over 400 years of black history through five distinct time periods. The Guide features more than 550 articles and is illustrated with historical film clips, audio recordings, and hundreds of photographs and other images. The site is available by subscription only.
<<http://www.eb.com/>>

Ethnic News Watch - This CD-ROM contains the complete text of more than 95,000 articles, editorials, and reviews published by more than 125 major ethnic newspapers, magazines and journals. The database includes local, national, and international coverage of newspapers from the following ethnic groups: African Americans, Hispanics, Latinos, Chicanos, American Indian, Asian, Jewish, Arab, and European Americans. It is updated monthly and includes a directory with bibliographic information for each

publication covered. The CD-ROM is produced by Softline Information, Inc. and is available via the Web, by subscription from Lexis-Nexis.

<<http://www.lexis-nexis.com/lncce/products/marketing/marketing-196.html> #Ethnic News Watch>

NetNoir - This site is available by subscription through America Online (AOL). Based in San Francisco, California, the company boasts to be "The Soul of Cyberspace." It develops, digitizes archives, and distributes content information for programming and commercial applications in all forms of interactive media. Its content includes Afro-Caribbean, Afro-European, Afro-Latino, as well as African American culture. The company has plans to distribute on other media platforms such as CD-ROMs, Kiosks, ISDN, and Interactive Television. Certain aspects of the service will be available in English, French, and Spanish.

<<http://www.netnoir.com/comm/aboutnn/NNmission.html>>

Government-related

Library of Congress. African-American Mosaic: A Library of Congress Resource Guide for the Study of Black History and Culture - This site is an on-line resource guide to the Library's African American collections. It covers four areas of black history: colonization, abolition, migrations, and the Work Projects Administration (WPA).

<<http://lcweb.loc.gov/exhibits/african/intro.html>>

MOLIS - The Minority On-line Information Service is designed to provide the latest information on African American and Hispanic colleges and universities. The database is ongoing and is updated as institutional information becomes available.

Information provided includes: scholarships and fellowships; annual federal assistance to Historical Black Colleges and Universities (HBCUs) and Hispanic-Serving Institutions (HISs); and research opportunities for the minority higher education community. The site is sponsored and supported by the Federal Information Exchange (FEDIX), an organization consisting of several federal agencies under a cooperative agreement from the Department of Energy, Office of Science Education and Technical

Information. FEDIX provides free on-line information retrieval service related to federal opportunities for the education and research communities.

<<http://web.fie.com/web/mol/user.htm>>

National Park Service. African American Civil War Memorial (AACWM) - This site is home to the U.S. Memorial for Colored Troops. The database includes an index of approximately 236,000 names of U.S. Colored Troops who served in the Civil War. The names are incorporated into the AACWM. The Index was completed by volunteers and the project is the first ever national monument to blacks serving in the Civil War.

<http://www2.cr.nps.gov/abpp/bu_past/sm96seve.htm>

Conclusions

Although the WWW boasts numerous guides, directories, and webliographies, it is still a work in progress and access problems with grey literature will not fully be resolved in this new medium. Impermanence is a problem. There are often missing, defective and outdated links as sites are relocated or disappear. Authentication is a problem as well. There are literally hundreds of web sites, listservs, and discussion groups; and there is great difficulty in ascertaining the authority behind most web sites. The sheer amount of data available makes it impossible to keep up with the daily arrival of new sites!

While, the Web may not be a panacea, it does provide for the global sharing of information across platforms and continents. Moreover, making information available electronically can serve as a means of enhancing, not supplanting what is in print. In terms of multicultural grey literature, we see the Web as a vehicle for archiving and preserving valuable resources that tell the histories of human societies. Therefore, our long term goal should be the creation of a self-evolving community of publishers, librarians, researchers, governments, businesses and philanthropic foundations working cooperatively together to insure capability, efficiency, and nonduplication of effort and cost in networking these materials. To achieve optimum success, this kind of partnership demands innovative thinking and creative leadership. The results will be phenomenal. We will see local and remote access to multicultural grey literature across a range of networking environments. The possibility of maximum searching capability and flexibility of these resources will become more of a reality; and we can push for the development of sensitive, or at least reasonable pricing models for access to these products. Surely any gains in this area will help to ensure long term access to these materials.

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GL'97 International Conference

November 13-14, 1997

**ACCESS TO MULTICULTURAL/MULTIETHNIC GREY LITERATURE:
A NETWORKED APPROACH****Asian American Resources**

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At the 1995 conference on Grey Literature held in Washington DC, we presented and advocated multicultural/or multiethnic grey literature be regarded as an integral source materials for studying the history and diversity of experiences of all cultures and races in the US. We expanded the definition of grey literature beyond technical reports and government documents to include theses, conference and meeting papers, transcripts of interviews, translation of foreign language articles that explore, clarify and detail the diversity of experiences of cultural and/or ethnic groups. This body of materials is generally not accessible through commercial distribution channels.

Let us take Asian American history as an example. A survey of Asian American literature reveals that there were major gaps in the history of the Asian American experience. Explanations for this gap are many. Firstly, original source materials could be sparse, because early immigrants were mostly illiterate laborers. Secondly, they may be written in the immigrants' native language, therefore linguistically not easily accessible to researchers.

Ethnic newspapers, as an example, chronicle immigration history and are the carriers of ethnic culture. Many titles may be lost forever because of lack of preservation, others may still be held in private collections.

Thirdly, the diversity of Asian American sub-groups which consist of 17 specific Asian groups and eight different Pacific Islander groups complicates the information gathering process and makes multiethnic/multicultural grey literature even greyer.

Asian Americans cover a wide spectrum of experience and cultures among themselves and in comparison to Asian nationals. They may share some common cultural traits, but it should be realized that Americans of Asian descent and Asians are not alike.

Asian Americans, be they early immigrants from East, Southeast, and South Asia or later refugees from Southeast Asia, each group has very different stories to tell. Prior to 80's, Asian American history tends to focus on what was done to Asian Americans, as subjects or victims of discrimination and bias, such as the impact of Exclusion Acts on Chinese communities and internment experience of 100,000 Japanese Americans during the Second World War.

A balanced approach to Asian American history would have included positive contributions made by Asian Americans to American life in the development of the West as an example. If Asian American perspective is to be taken fully into account, we advocate that source materials besides government sources, academic research papers, grey literature needs to expand itself into the broader context of ephemera which include: calendars, clippings, directories, company reports, guides, information leaflets, menus, newsletters, ethnic newspapers, press releases, and society ephemera based on immigrant language sources.

There is a pressing need to take active inventory of multiethnic/multicultural grey literature which may have been scattered and long buried in various East Asian collections, state archives, local libraries and historical societies throughout the country as Wei-chi Poon, Librarian of Asian American Studies Library of UC Berkeley so correctly observed. Early 1990's has ushered in a brave new age of the INTERNET and cyberspace for the empowerment of Asian American communities and articulation of their concerns.

As early as December 1994, Wataru Ebihara observed in his electronic document *An Internet Guide for Asian American Cybernauts*:

"Within this immense international INTERconnected network of computers, Asian Americans are alive, active and articulate. Communicating over the music of modems and the tapping of computer keyboards, a poetry of electronic culture emerges from Asian America!"

Evidence suggests that Asian Americans are the Net's largest single ethnic population. Often isolated and fragmented in communities across the nation, Asian Americans from New York to Hawaii can now transcend the barriers of space and time to participate in electronic exchanges. Electronic mailing lists and Usenet newsgroups provide discussion on an enormous range of topics. Specialized Asian American events which in the past were not covered in the mainstream press, yet now they are often mentioned on mailing lists. Asian Americans of common interests can use electronic mailing lists to reach out and to share ideas, opinions and experiences. Asian American organizations operate electronic mailing lists to keep their members informed.

The following is a list of just a few select examples of grey literature in the electronic network environment.

1. The Asia-Pacific Exchangelist APEX-L@uhccvm.uhc.hawaii.edu

The list serves as a forum for sharing of information and discussion of topics, trends and issues that are determining the shape of education on multicultural, international campuses.

2. OCA website <http://www2.ari.net/oca>

Founded in 1973, the Organization of Chinese Americans, Inc. (OCA) is a national non-profit, non-partisan advocacy organization of concerned Chinese Americans. OCA is dedicated to securing the rights of Chinese Americans and Asian American citizens and

permanent residents through legislative and policy initiatives at all levels of the government. OCA aims to embrace the hopes and aspirations of the 1.6 million citizens and residents of Chinese Ancestry in the United States as well as to better the lives of the 7.6 million Asian Americans across the country.

3. Asian American Studies Library of UCLA
<http://www.sscnet.ucla.edu/aasc/>

The Asian American Studies Library in 2230 Campbell Hall is one the most highly concentrated areas of information of Asian American research in the world. It houses extensive indexed bibliographies and numerous electronic reference aids and has over 5,000 books, 30 Asian Pacific ethnic and regional newspapers, over 300 community and campus newsletters, and 5,000 pamphlets. Currently, it is in the process of changing most of its collection to a computer-based system which will make it easier to access information from their huge collection of materials. With this new database, the new Library will be easier to use, help to promote a national network with other schools and libraries to form a national network of resources of cooperative research that will facilitate research to new heights of ethnic research.

There are numerous archives that are available for Chinese Americans, Korean American, and Japanese American movements that offer invaluable tools for papers and research into the Asian American community, particularly in Southern California.

4. South Asian Archives
<http://www.lib.uci.edu/sea/seahome.html>

The Archive collects materials relating to the resettlement of Southeast Asian refugees and immigrants in the United States (and to a lesser extent, worldwide), the "boat people" and land refugees, and the culture and history of Cambodia, Laos, and Vietnam. There is a special focus on materials

pertaining to Southeast Asians in Orange County and California. At present, this Web page offers back issues of the Southeast Asian Archive's quarterly newsletter, and some lovely images of Hmong pa ndau textiles.

5. WWW Hmong Homepage <http://www.stolaf.edu/people/cdr/hmong>

The WWW Hmong Homepage is a collection of resources relating to Hmong history, culture, language, and current events. The Hmong Experience in Asia and the United States (Introduction Chapter from Hmong Means Free by Dr. Sucheng Chan). Hmong Refugees from Historical Background. Hmong in Laos.

6. University of Minnesota Refugees Studies Center <http://www.isp.acad.umn/rsc/rsc.html>

An archive collection of documents on the culture, language, adaptation, education, physical and mental health of refugees supports the Center's research and program efforts. The Center issues Refugees Review newsletter and list of publications. It links members of the University and community-based organizations for collaboration focusing interdisciplinary areas.

7. The Glass Ceiling Commission http://www.ilr.cornell.edu/library/e_archive/glassceiling

The Glass Ceiling refers to invisible, artificial barriers that prevent qualified individuals from advancing within their organization and reaching full potential. The term originally described the point beyond which women managers and executives, particularly white women, were not promoted. Today it is evident that ceilings and walls exist throughout most workplaces for minorities and women. These barriers result from institutional and psychological practices, and limit the advancement and mobility

opportunities of men and women of diverse racial and ethnic backgrounds.

The Glass Ceiling Commission is a 21-member body appointed by the President and Congressional leaders and chaired by the Secretary of Labor. Created as part of the Civil Rights Act of 1991, the Commission works to identify glass ceiling barriers and expand practices and policies which promote employment opportunities for the advancement of minorities and women into positions of responsibility in the private sector. It focuses on barriers and opportunities in three areas: 1) the filling of management and decision making positions: 2) developmental and skill enhancing activities: and 3) compensation and reward systems.

There is a report submitted by Deborah Woo, Institute for the study of Social Change, UC Berkeley entitled Barriers to work place advancement experienced by Asian Americans. (160 pages)

The Glass Ceiling Commission completed its mandate in January 1996. It no longer exists. Inquiries concerning the background studies, reports, and other written materials produced by the Commission should be directed to the following contact agency:

Attn: Glass Ceiling Commission Information
U.S. Department of Labor
Office of Small and Minority Business Affairs
200 Constitution Avenue N.W., Room C2318
Washington, D.C. 20210

8. Cornell Asian American studies center resources Newspaper Clippings and Subject Index.
<http://www.aasp.cornell.edu/aasp/resource.html>

The Center maintains a newspaper clipping service, filed by subject, and an Asian American subject index of publications on Asian Americans that supplements Amerasia Journal's annual bibliography. The Center's index covers the following subjects:

Book Reviews
Chinese
Community
Comparative Studies (African Americans, Latinos, Native Americans)
Culture (Art, Films, Literature, Music, and Theatre)
Education
Family
Filipinos
Gay/Lesbian Issues
Health (Mental and Physical)
Identity
Immigration
International (Asian American and Asia)
Japanese
Koreans
Labor
Legal Issues (Law)
Pacific Islanders (including Hawaiians)
Political Power
Politics (Legislation) and Social Movements
Radical Activism
Regional Studies (East Coast and New York)
Religion
South Asians
Third World/Minority Solidarity/Relations
Vietnamese and Southeast Asians
Women

9. Asian Community Online Network <http://www.acon.org/acon>

ACON was started by the Institute for Global Communication with help from the Telesis Foundation in order to fill in those gaps of knowledge for Community Based Organizations (CBO). ACON's mission is to act as a community resource for Asian Pacific American (APA) CBOs and other non-profits to help them with getting more information on what exactly the Internet can do for them.

10. The East Indian Diaspora: 150 Years of Survival,

Contributions, & Achievements

<http://www.qc.edu/Asian American Center/aacresea.html>

Edited by Tilokie Depoo with Prem Misir & Basdeo Mangru. Copyright 1993 by the East Indian Diaspora Press. Published by the Asian/American Center at Queens College, CUNY.

11. City University of New York-Asian American Center Resources
E-Information Series

<http://www.qu.edu/Asian American Center/acare>

The Center aims to provide people from all walks of life with a practical, basic introduction about Asian New Yorker. The primary objective is to promote mutual understanding and initiate inter-ethnic discussion. In addition to E- information sheets, the Asian/American Center has available a series of Working Papers which examine some of the above topics in greater depth and also address other aspects of Asians in the Americas.

12. Ethnic Studies Movement Archives

<http://www.sscnet.ucla.edu/aasc/mvmt>

The resource materials were collected by Steve Louie in the late 1960s and early 1970s. The materials include Asian American Movement newspapers, from San Francisco, New York, Chicago, Los Angeles, and other communities; newsletters and pamphlets relating to the Third World Strike for Ethnic Studies at UC Berkeley and other campuses; and posters and leaflets of community events from that time period. Students in the Spring Quarter taking course on "Asian American Movement" will most likely develop a web project for the class.

13. Japanese Americans in Hawaii

<http://www.aaim.com/osmill/resource/theses/home/home.html>

A senior theses project about Japanese Americans in Hawaii. Subjects covered include business and enterprises, culture, education, immigration, labor,

military, newspapers and the media, Okinawans, plantations, politics, religion, science, arts, sports, and other related legislations.

14. Chinese Historical Society of America
<http://www.sirius.com/~tedwong/chsa>

The web page is devoted to helping researchers and students who have an interest in Chinese American history. Three kinds of materials will be presented here. They are materials from the Society's publications, notes about other sources and links to on-line sources, including articles on genealogy and women's studies.

15. Asian Pacific American health-related website
<http://www.igc.org/apiahf>

A national advocacy organization dedicated to promoting policy, programs and research efforts for the improvement of health status of Asian Pacific Americans. The web page is a cooperative agreement between APIAHF and the Office of Ministry of Health, U.S. Department of Health and Human Services.

16. Asian American popular magazine
<http://www.amagazine.com/>

A commercial publication. Table of contents of past issues are put on line with listing of current Asian American titles and other APA links.

17. Asian American business journal
<http://www.nichibeijournal.com>

The electronic journal available in both English and Japanese, is devoted to informing, teaching and entertaining its readers with articles about Japan, and

Japan related topics. It also contains archive of articles. It provides interesting Japan-related links.

18. Asian American museum <http://www.asianart.org>

A website for the Asian Art Museum of San Francisco, the largest museum in the Western World devoted to the arts and culture of Asia.

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Survey and Collection of Technical Reports Published by Japanese Private Companies

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ABSTRACT

Technical reports provided by Japanese private companies are one of publication types of grey literature which are usually not-for-sale or hardly available through conventional and commercial distribution routes.

Due to insufficient information publication by the private sector, it has been very difficult to locate and obtain them.

Therefore, JST conducted a survey on 1,582 Japanese companies listed in stock exchanges during January through March of 1996 to investigate the publishing situation and collect additional literature on technical reports.

Based on the survey results, additional information from newly collected publications is added to JST databases. These publications have not been previously collected.

Outline of survey results:

Response rate: 64.6% (1,022 of 1,582 companies)

Number of companies publishing technical reports: 275 (26.9%)

Number of technical reports issued: 349

Based on this survey, JST collected 33 newly publications selected from 349, which brings the total held by JST to 364, or 87.1% of all technical reports of private companies.

JST databases now cover most of the scientific and technical reports provided by the private sector.

1. INTRODUCTION

Japan Science and Technology Corporation (JST) was created through the integration of two active corporations, the Japan Information Center of Science and Technology (JICST) and the Research Development Corporation of Japan (JRDC) as one of the key organizations for implementing policies of the Science and Technology Agency (STA).

It was established for the purpose of providing an adequate foundation for promoting Japan's science and technology through dissemination of the relevant information and through cooperation of research.

JST went into operation on October 1, 1996 to take over and further develop the activities of the two corporations and to enhance overall science and technology of Japan by organizing a fundamental environment for scientific and technological information and by activating advanced and creative research and development.

The main activities are as follows:

- Basic Research
- Research Cooperation
- Scientific and Technological Information
- Technology Transfer
- Research Support
- Public Understanding of Science and Technology

JST Information Center for Science and Technology (JICST) is mainly engaged in the dissemination of scientific and technological information.

JST is collecting literature in every field of science and technology from about 60 countries, processing (abstracting and indexing) them and computerizing a large amount of scientific and technical information. Computerized information is offered using an on-line service.

2. GREY LITERATURE COLLECTED BY JST

In spite of the fact that Grey Literature publications are often of great value, they are usually published not-for-sale and are often not available through conventional distribution routes. The fact that JST is collecting Grey Literature publications, compiling them as databases and distributing them to the world is highly significant.

More than half of publications in our collection are published in Japan and 63% of them are publications which fall under the category of Grey Literature.

Japanese Grey Literature publications collected by JST can be roughly classified into the following 4 groups by publishing organizations:

Publications of public agencies	29%
Preprints of academic societies and associations	14%
Bulletins of educational institutions	15%
Technical reports of private companies	5%

JST uses the directory and other tools to collect Grey Literature. There are references for checking publications published by government organizations, societies, and public organizations, but there is no list of documents published by private companies, making it difficult to check their publications.

JST has studied the publication of technical reports for private companies listed on the stock exchanges for the purpose of investigating the publishing situation of reports published by private companies and for extending our collection of data for technical databases.

3. OUTLINE OF SURVEY ON PUBLICATION OF REPORTS (TECHNICAL REPORTS) BY PRIVATE COMPANIES

JST had once sent a questionnaire asking for the publication status of technical reports from July through August 1986. Such surveys are necessary to assess the present state of reports that are not delivered to JST and to grasp the trends of technical reports published by private companies in Japan.

This time, JST sent out a questionnaire to 1,582 Japanese companies listed on the stock exchange from January through March of 1996.

The rate of reply to this survey was as high as 64.6%, due to company visits and follow-up requests in writing or by telephone to increase the recovery rate after sending the questionnaire (see Table 1 and Fig.1).

Compared with the answering rate of the previous time (42.6%), the rate for this survey (64.6%) was rather high as can be seen in Table 2.

The results are as follows.

- 349 technical reports were published by 275(26.9%) of the companies that replied (see Table 2 and 3).
- 254 reports has not been collected by JST (see Table 2).
- 79.9% of 254 were written only in Japanese (see Fig.4).
- 31.1% of 254 have an abstract (see Fig.5).
- 87 reports of 254 are expected to add to JST's collection (see Table 2).

At the beginning of this questionnaire, JST had collected 331 titles of technical reports from 247 companies.

This survey found that 254 reports were not collected by JST and 87 reports could be sent to JST.

The rest were distributed within only the company.

From these 87 reports, JST asked that the report be sent as a sample to judge whether the reports should be continuously sent or not. As a result, JST collected 33 reports as new data.

4. CONCLUSIONS

JST builds up databases by abstracting and indexing articles in these collected materials, and makes them available on-line through databases such as JOIS, STN International and Internet.

Almost all published in Japan are written only in Japanese, however, JST translates into English the abstracts in the databases to make Japanese information easily accessible from foreign countries.

For this purpose, JST uses a Japanese-English machine translation system developed in house.

JST will, as a central organ of Japanese scientific and technological information, continue to make efforts to collect, process and distribute Japanese information by satisfying comprehensive coverage and timeliness in the future as well.

Table 1
Number of Reply by Industries

Industries	Number of Questionnaire Sent	Number of Reply	the Rate of Reply
Construction	173	143	82.7%
Electrical Equipment	200	128	64.0%
Machinery	193	112	58.0%
Chemicals	156	111	71.2%
Food	118	83	70.3%
Transport Machinery	101	66	65.3%
Iron and Steel	58	43	74.1%
Textiles	98	42	42.9%
Metal Products	68	38	55.9%
Other Products	65	36	55.4%
Medical Supplies	43	33	76.7%
Glass and Earthenware Products	59	31	52.5%
Non-Ferrous Metals	40	27	67.5%
Precision Instruments	28	24	85.7%
Land Transportation	51	22	43.1%
Marine Transportation	23	20	87.0%
Pulp/Paper	31	17	54.8%
Mining	10	10	100.0%
Power/Gas	19	10	52.6%
Petroleum and Coal Productions	13	8	61.5%
Rubber Products	18	8	44.4%
Fisheries/Agriculture/Forestry	8	7	87.5%
Air Transportation	5	3	60.0%
Communication	4	0	0.0%
Total	1582	1022	64.6%

Fig.1
Number of Reply by Industries

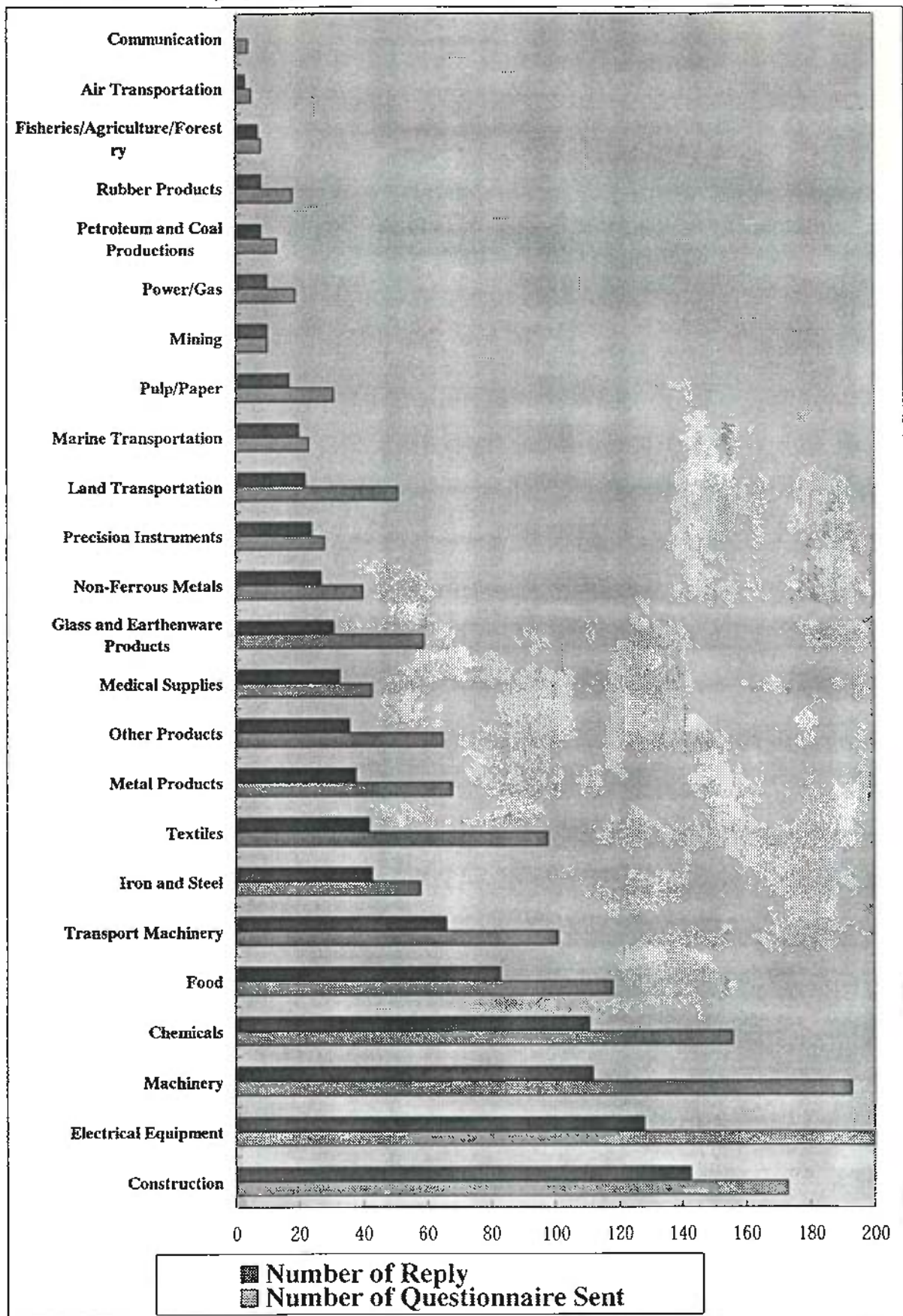


Table 3
Number of Technical Reports Issued

Industries	Number of Companies Publishing Technical Reports	Number of Technical Reports Issued
Construction	70	101
Electrical Equipment	32	34
Machinery	17	20
Chemicals	33	46
Food	13	17
Transport Machinery	20	22
Iron and Steel	8	13
Textiles	5	9
Metal Products	8	8
Other Products	4	7
Medical Supplies	18	19
Glass and Earthenware Products	15	16
Non-Ferrous Metals	10	11
Precision Instruments	2	2
Land Transportation	3	4
Marine Transportation	1	1
Pulp/Paper	3	4
Mining	3	3
Power/Gas	4	4
Petroleum and Coal Productions	2	2
Rubber Products	1	1
Fisheries/Agriculture/Forestry	2	3
Air Transportation	1	2
Communication	0	0
Total	275	349

Fig. 3
Number of Technical Reports Issued

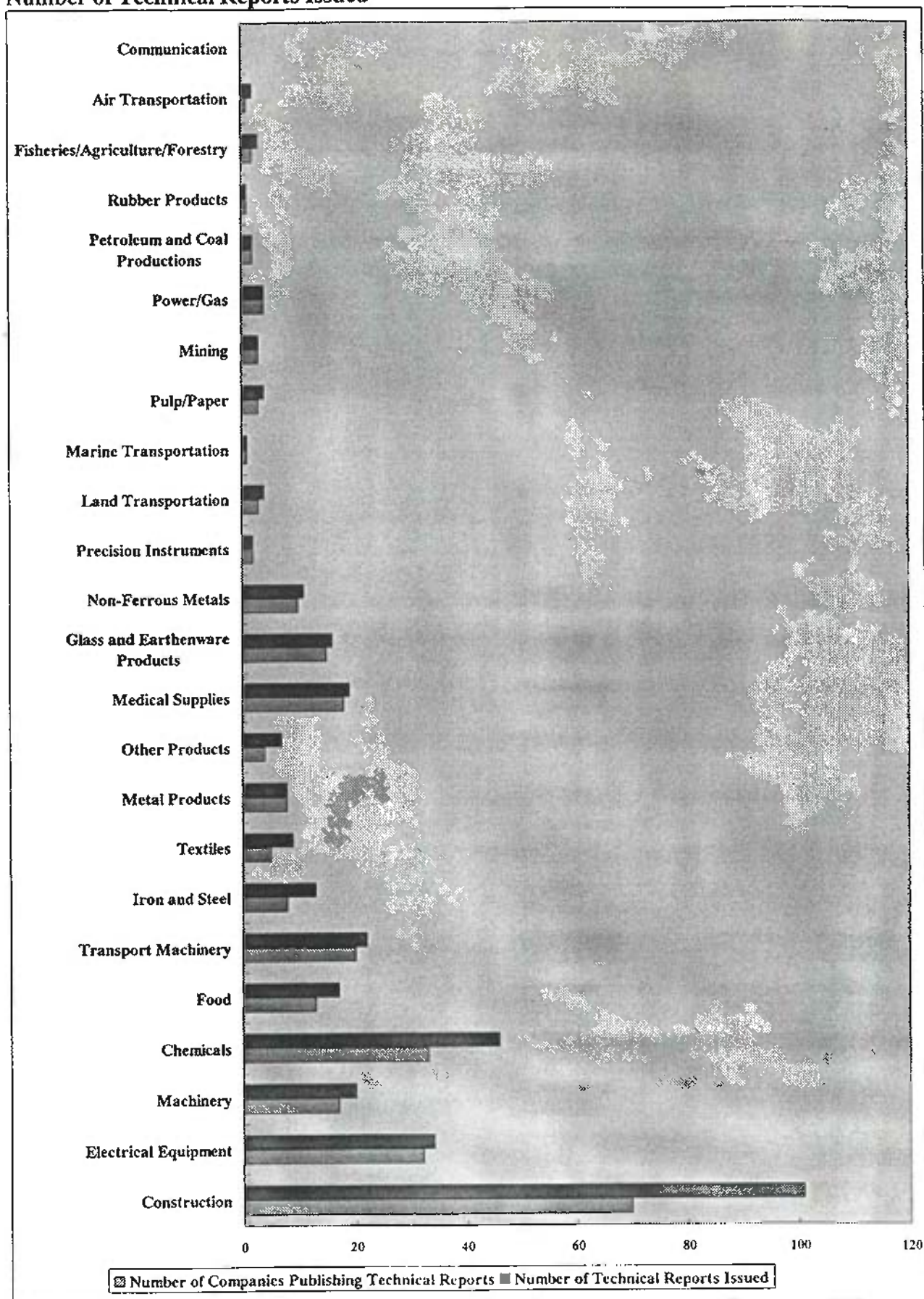


Fig.4
Languages

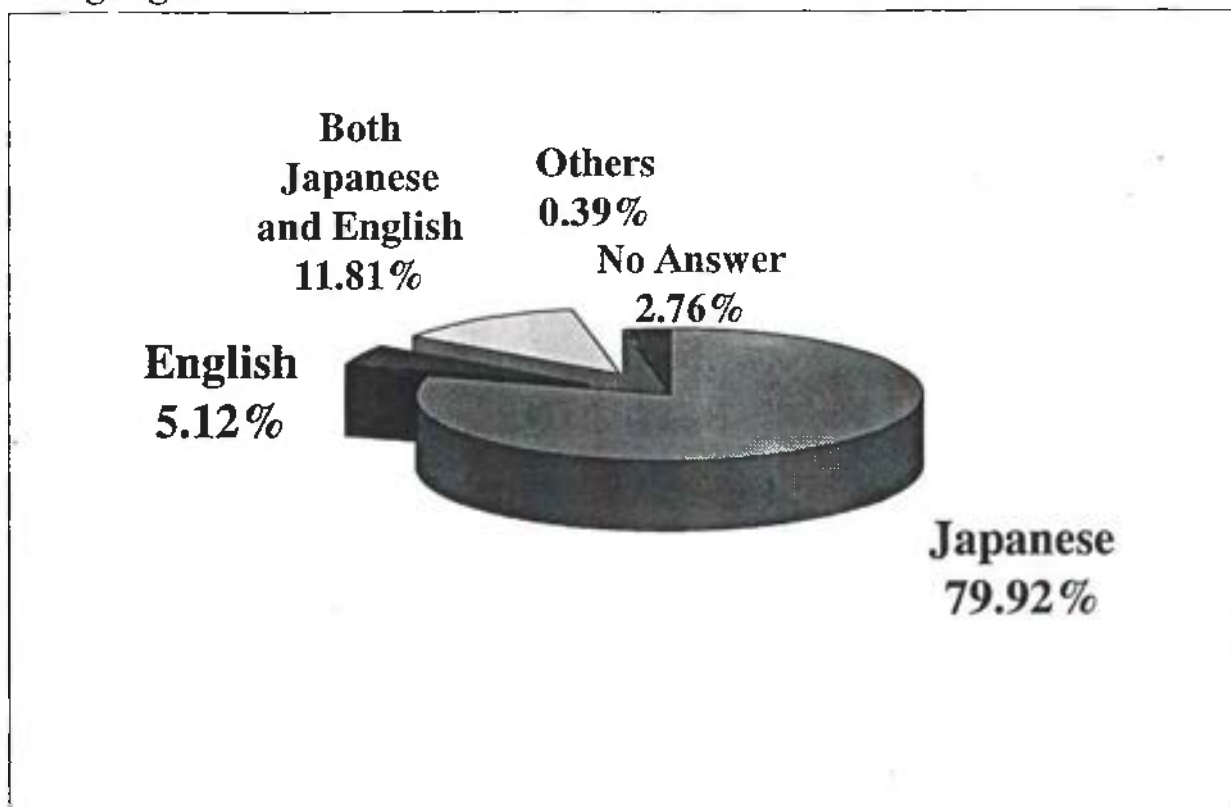
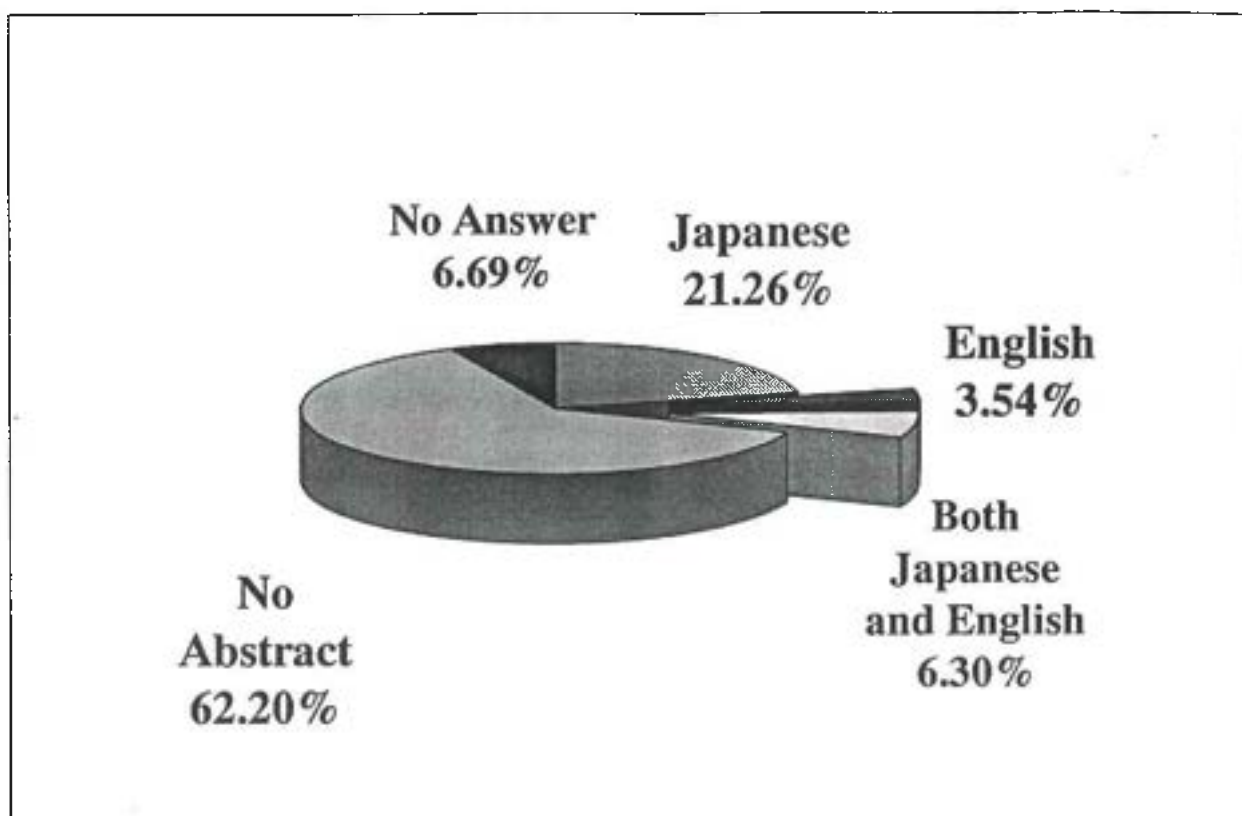


Fig.5
Abstract and It's Language



Management, sources, and access provision to I.I.S.L. grey literature collection

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Introduction

The International Institute for the Sociology of Law is located in Oñati (Basque Country) Spain. Since its inauguration in 1989 it has been supported by the Research Committee for the Sociology of Law, a branch of the International Sociological Association, and the Spanish regional Basque Country Government. During the academic course period, in addition to specific organized workshops we also have a Master programme in Sociology of Law taught in English by 14 professors attended by 20 students coming from 13 different countries including Europe, North and South America, and Africa.

There are two departments that give support to these activities: a specialized Library (10.000 books) and a Centre of Documentation, which is my department, in charge of journals and grey literature. We subscribe to 250 titles of periodicals on a regular basis, plus some monographic issues that are purchased on demand.

Management

Our grey literature collection covers the broad area of Sociology of Law. We hold some 5.000 grey documents, 60% of which are available in English and the remaining in Spanish, French, Italian, German, Dutch, Portuguese, and other languages. Most of them have been written over the last 30 years, many in the last ten years (the age of our Institute). Countries of origin are mainly from North America and Western Europe, the geographical areas where the Sociology of Law and Sociolegal Studies are more developed. But we also have an interesting set of materials coming from Latin America, Eastern Europe, Australia, Asia, and Africa.

All our documents have been registered, analyzed and classified. This is the standard procedure for all papers, workshop materials, working papers, reports, dissertations, Ph.D. Theses, and other unpublished materials. All of them are assigned at one classification code representing the primary focus of the document. Keywords are in English for the sake of our users. This literature is not freely accessed as are the journals and books.

Sources

Our community of clients: scholars, post-graduate students, and professors are our biggest source for grey literature. Since the scope of our database is mainly focused on the sociology of law, many of the researchers producing works in this field are interested in appearing in our databases.

The Institute organizes annually some 20 workshops. Groups of 15-20 scholars from different countries attend these 2-3 days sessions to discuss a central topic. Usually, copies of the workshop papers are given to the Centre of Documentation and then registered in our bibliographical database. In addition to the regular documentary analysis (English keywords) there is a specific search field for the title of the workshop, chair name, date and place. On this occasion we can also receive previous reports or papers from the researchers.

At the end of the Master programme every student is required to present a dissertation, directed by one of the professors, before a Master's tribunal. After obtaining the degree, each thesis is registered in our database. There is also an annual Summer Course which provides us with a set of written lectures from the professors.

Members of the Research Committee for the Sociology of Law and other relevant institutions also provide us with much of our grey literature. We also receive copies from papers given at their Annual Meetings, and their respective branches: Law and Society Association, from USA, and the Socio-Legal Studies Association, from the United Kingdom.

Access supply

In 1994, our Library and Centre of Documentation published a small booklet: "List of Key Words in the Sociology of Law = Lista de Descriptores de Sociología Jurídica" as a search tool for both our databases. It has proved to be an useful instrument to know the range of terms and the coverage of our field.

Since 1990, a bibliographical bulletin "Current Legal Sociology : A Periodical Publication of Abstracts and Bibliography in Law and Society". is published biannually. This bulletin contains a classified list of bibliographic references to the Library and Centre of Documentation's most recent acquisitions. It can be ordered from the IISL by filling out the subscription form, which is also available in our Web page.

Within our facilities at the IISL, it is possible to make search queries from our home databases. They contain up to 46.000 bibliographic references to our own resources. Five thousands of them are grey literature, that is to say, dissertations, papers, working papers, Ph. D. Theses, reports, etc...

Internet access

In late 1996, we have added a search request form on our Web homepage, that has been very much appreciated by our users. Although we do not have our databases accesibles in Internet. This Web page is a bridge between our information and the outside users. Clients can ask for free a search request, that can be sent either to their e-mail address as an annexed file or to their postal address as a printout of the search results.

This service can be accessed via our link at the Institute's WebPage.
<http://www.sc.ehu.es/onati/bicding.html>

The introduction of this form on the IISL's Web page has caused a significant increase in the number of searches requested during the year. The following graphs, provide you (for the period between July 1996 and July 1997) with a statistical comparison between searches requested via the Web page and those that are requested using other means.

Whilst the number of requests received by fax or post has not decreased in comparison to other years, it is, nevertheless true that those that have been received via the Internet now account for one third of the total in this, its first year of operation.

Of the 33% of requests received via the Internet (18% via the Web page and 15% via e-mail) the majority ask to receive their reply at an e-mail address. In fact other customers, who use other methods to access the IISL also request that the material obtained be sent to an e-mail address.

Searches can also be obtained by using the following e-mail addresses:

Library : sole@iisl.softec.es
Centre of Documentation : elvira@iisl.softec.es

Internet access by countries

The large percentage (49%) of requests received from Latin American countries provides us with some idea of the importance of the development of new communications for students and researchers from these countries.

In the near future we hope to increase the number of requests from those areas of the world which are currently under-represented on the communications for students and researchers from these countries

Almost the half of the total amount (15% and 30%) of requests, come from Europe and North America. This high rate is related with the fact that those countries are our usual working area.

Other ways of access to our grey literature

Searches can also be carried out using one or a combination of the following search fields: words in title or abstract, keywords, geographic location, relevant institutions, author, title, language, publication date, and full text of the bibliographic references.

As a promotion of our Institute, we send free of charge a printout of up to 40 bibliographic references, including grey literature references, linked to the queries of our clients. Search requests have been communicated in the usual ways: fax, phone calls, letters.

If a client would like such a search, they only have to mail or fax a request to the Institute, specifying: Library - Centre of Documentation.

Requests can also be made directly by those who visit our facilities, which often include students or professors. In case visitors are unable or prefer not to conduct the computer search themselves, searches can be conducted by the staff.

Introductory comments

DONALD B. SIMPSON

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This conference, the third International Conference on Grey Literature and its predecessors, have focused on the content of grey literature, its availability and accessibility. We first examined grey literature in print form, and over the last four years have concentrated more directly on grey literature in the electronic environment. Even before we concerned ourselves with the electronic content of grey literature, however, we using automated means to acquire it, catalog it, preserve it, and make it available to those who wanted to use it. Clearly, we have been in the business of organizing and managing grey literature for many years.

Perhaps our first attempts at gaining control over grey literature in a networked environment was through creating a bibliographic record that could be used by other libraries. Perhaps it was through a union catalogue of serials where several libraries recorded their holdings of grey literature titles in order to provide access to as broad a run for these titles as possible. Networked acquisitions processes included some mechanism of informing our peers what we were receiving and when it was or was not received. Today, of course, we are breaking new ground by means of creating and coordinating the content of grey literature electronically.

It is all too easy for those who do not deal with these issues to assume that grey (or any other color) literature magically appears in electronic form for all to see, access, download, and use. Those of us working in the library and information industry are well aware that this is not the case. Internally, we experienced the impact of organizing and managing grey literature as a result of making bibliographic records available online. Our equipment needs changed dramatically, and we reorganized our staff countless times to accommodate the changes.

Standardization of information, whether metadata or article content becomes imperative when we talk about data transfer. Issues of ownership and/or access become important topics for discussion, not to mention licensing agreements and copyright. The traditional, old-fashioned vision of the library that has been held dear to many through many years is not only changing before our eyes, it is changing with unprecedented speed.

The speakers in this cluster session will describe the impact of many of these changes on their institutions, what has worked well for them, and the problems they have encountered. We are grateful to them for sharing their experiences and perspectives during this time when technology is transforming our profession.

International Cooperation in Dissemination of Grey Literature using the INTERNET: A Protocol

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Abstract

The demand for the grey literature issued in Japan is strong: by various branches of the U.S. government to help formulate international policies; by industry to promote production and strengthen competitiveness in world trade; in academic; as well as in many other areas. However, the most problematic aspect for the unpublished information in Japan has been, as the description "difficult-to-obtain information" indicates, its timely acquisition.

The Japan Documentation Center, established in the Library of Congress as a part of the solution to this problem, collects and disseminates unpublished, so-called grey literature. The bibliographic information contained on the data sheets is available on the INTERNET. The database can be easily searched, enabling the user to identify documents that are useful to one's research. The requested documents are printed out and sent to the requester. Obstacles of distance and time are thus minimized. In the meantime, the Center is planning to make those documents available in full text over WWW as soon as possible. It is accomplished only through the combination of experts' knowledge and experience, a large funding from Japan, international cooperation of document suppliers, and most importantly the capability to utilize electronic transmission of data.

Introduction

Japanese "grey literature" presents intriguing problems to the information professional. Grey literature has been defined in various ways by a number of researchers. For example, certain forms of literature are included in one definition while excluded in others. For the purpose of this paper, I adapted my own definition¹ which is based mainly on Hayashi² and Hanada³ and also based on practice, as it applies to the Japan Documentation Center's functions.

 Grey literature is considered here to be documents that are neither "black" (classified) nor "white" (published and widely disseminated for purchase). What is "grey" is anything in between, thus covering a vast range and great amount of

literature. Grey may seem to have a connotation of ambiguity. On the contrary, the nature of this category of literature is in fact to clarify the aspects of the organization, activity, policy, etc. that may be ambiguous.⁴ Some examples are technical reports, many reports by government agencies, conference proceedings and preprints, policy papers, draft legislation, ministry studies, and studies by Japanese "think tanks."⁵

In the United States, Japanese grey literature is usually referred to as "difficult-to-obtain literature," in contrast to the relative ease in obtaining U.S. grey literature. That is precisely the major reason for the existence of the Japan Documentation Center (JDC) and its Tokyo Acquisitions Facility (TAF).

The Mission of the Japan Documentation Center

The Center's mission is to acquire and disseminate the most current and "difficult-to-obtain" Japanese literature from the immediate sources in Japan by employing simple bibliographic control, making documents electronically accessible, and placing information in users' hands in a timely manner. Supplying full text information is the ultimate goal of the Center.

At a time when there is a great deal of discussion about the level of American competitiveness in the global economy, the Japan Documentation Center's work becomes central to fostering American understanding of Japanese thinking on their economy, with particular emphasis on government, society, research and development, and international relations. "Information" such as that which is acquired by the Center can illuminate the relationships between Japanese technical and industrial organizations and Japan's social and economic policies.

This subsequently leads us to a larger picture: the Center is to develop an efficient and effective protocol for information acquisition, management and dissemination that involves international cooperation in order to facilitate necessary information flows without limitations of time and distance.

In addition, the Center strives to inform current and potential users in the scholarly and research communities on available resources and to develop users' knowledge and skills in maximizing use of such resources.

The Center's Collections

The Japan Documentation Center collects documents issued by Japanese government and non-governmental organizations in a wide range of public policy and research fields, including draft legislation, judicial decisions, etc., as well as materials in economics, commerce and industry, the environment, politics, social conditions, and national defense.

In addition to the primary source materials described above, the Center subscribes to some 30 journals and various annual publications and reference works. The Center works hard to obtain the latest editions, with vendors being asked to use express mail. Since these items do not go through the routine check-in procedures of the Library, the Center can make them available to the user almost immediately after they are issued. These materials are managed and controlled (both bibliographically and physically) by the Center and are available for users' inspection and use on site.

The Center's activities would be extremely difficult to carry out without the cooperation of major government agencies, as well as a number of professional associations and corporations in Japan. Especially important to be mentioned here is a special arrangement with the Japan National Diet Library (NDL). The National Diet Library and the Library of Congress have had a long history of a successful exchange program, with each library saving those national, as well as local, government reports and other documents to send to the other library. Many of these materials are very appropriate for the Center's users. The National Diet Library allows the TAF staff to go through those materials, pick up relevant titles, and send them to the Center without waiting for the normal exchange period or going through standard procedures. Thus, current information, especially that which is not for sale, can be obtained by the Center very efficiently and in a timely manner.

Numerous non-governmental organizations including the Keidanren (The Federation of Economic Organizations) and the Database Promotion Center also give special considerations to the Center's needs and make exceptions to their routines by simplifying procedures to speed up the process in order to supply the information to the Center.

Physical Set-Up of the Center

The concept of locating the Japan Documentation Center at the Library of Congress flows from three issues. First, the Center is intended primarily to serve the needs of the U.S. Congress. Second, more than half of the Library of Congress's collections are in languages other than English, with Japanese, as well as Chinese, German,

Russian, and Polish language collections being the largest outside those countries in which the language is spoken. These collections are the bases for programs that serve the research needs of Congress, enhance the nation's understanding of American and foreign cultures, and promote scholarship generally. Third, locating the Center in the Asian Division of the Library of Congress enhances the Center's activities thanks to the Division's own vast collection of Japanese language materials.

A Japan Task Force was formed at the Library of Congress in 1991, with a part of its charge being to explore feasible approaches to establish the Japan Documentation Center. The Task Force recommended the formation of two facilities for the Center to carry out its mission. Accordingly, two offices were established: one in Washington, now known as the JDC; the other in Tokyo, now called the Tokyo Acquisitions Facility and usually referred to as TAF. The Center operates the Tokyo Acquisitions Facility (situated in the Akasaka Twin Tower building), which concentrates its activities in acquisition and initial processing of Japanese information.

At LC, the Center consists of the director and a reference librarian as of October 1997, soon to be joined by two additional reference librarians. Recruitment is in process at this moment. The Tokyo Acquisitions Facility has been operated by the Center's director and is staffed by two locally contracted reference librarians as Bibliographic Service Representatives.

Functions

The Center's principle functions, closely related, are to provide current public policy information on Japan through building a document collection and providing access to that collection.

- (1) The Center responds to all Congressional requests/inquiries and to those from other users in the scholarly and research communities for Japanese policy information. An unique aspect of the reference service is document delivery service. The Center provides translations on a selective basis.
- (2) The Center maintains a database of key public policy source materials and creates English abstracts for each document; the public has Internet access to this database. The Center also maintains a system for electronic storage and retrieval of those documents.

- (3) The Center oversees the activities of the Tokyo Acquisitions Facility, in particular to help establish policies, guidelines and procedures for acquiring and processing documents.
- (4) The Center offers instruction to American researchers, as well as people interested in the use of Japanese policy information generally, through seminars, conferences, and publications.

Flow of Information

Staff members in Tokyo routinely scan several newspapers to learn what events are taking place, identify which government newsrooms will issue related reports, announcements, etc., and determine which documents might then fall within the scope of the Center's established guidelines. They visit those agencies to collect information/documents, re-visiting if documents are delayed. They also maintain various personal contacts with staff of many other Japanese organizations to keep them informed of our interests.

After obtaining those documents, the reference librarians at TAF prepare a bibliographic sheet for each document. This includes a romanized transcription of the title and issuing agency name together with the English translations, and basic descriptive bibliographic information. Both bibliographic sheets and documents are sent to the Center weekly via express mail services.

In Washington, the bibliographic sheets are reviewed against the documents. The staff add a summary of the contents in English and index terms, enter the records into a bibliographic database and have the documents scanned. The English summary is particularly useful for keyword searching and determining relevancy. Documents of up to 150 pages are scanned and the information stored in optical disks maintained by the Congressional Research Service (CRS). The bibliographic data is part of the CRS's online system and the JDC data is concurrently placed in a separate file, currently the LC gopher, MARVEL (Machine-Assisted Realization of the Virtual Electronic Library). The researcher may access this file through the JDC home page, maintained on the Library of Congress Web home page, to conduct searches. The lengthier documents that are not scanned are physically controlled in the Center.

Resources

Since the Center began its operations in 1993, it has been providing services to a broad user base. Within the Library, the most avid users are the Japan specialists in the Congressional Research Service (CRS) and Law Library, who provide their research results to Congress. The CRS exclusively serves members and committees of the Congress by responding to their analytical and information needs. The staff work closely with committees to identify and analyze legislative issues, formulate policy and program proposals, draft legislation, and carry out congressional responses. Staff of the Law Library's Eastern Law Division include specialists in Japanese and Asian law.

Each LC researcher who specializes in Japan has a defined area, such as economics, law, or science and technology policy. In consultation with each of those researchers, Center staff maintain an individual profile of interests, and take those interests into consideration in forming the general guidelines for the scope of literature to be collected. These basic frameworks are frequently reviewed and revised according to the need of users, taking into account developments in politics and economics in Japan.

In keeping with the Library's policy of serving the nation and being an international resource, the JDC makes its collections available to other users from Federal government agencies; academic and research institutions (both in the public and private sector, including think tanks and R&D institutions); American business and industry; and the general public. As Internet use has expanded, researchers from around the world have been making use of the JDC collections with ease. The Center routinely receives inquiries and requests from researchers in universities and research centers in the United States as well as in countries such as Japan, Austria, France, Germany, and Norway.

Methods of Access

Researchers in the Congressional Research Service search the online index file in their website and can call up documents from the optical disk system onto the screen for viewing. They may request print-outs via their own microcomputers. When JDC receives requests from researchers outside CRS, Center staff search the JDC files, print out the document texts and send out the paper copies. In the case of requests for documents more than 150 pages in length, the staff retrieve the original document from the shelf and either send out requested excerpts or circulate it through the user's institution on a loan basis.

Users of JDC

Beginning in November 1994, users have been able to search JDC's index file on the Internet through the LC gopher, LC MARVEL. That file has also been accessible through the Library's World Wide Web home page (<http://lcweb.loc.gov> or <http://www.loc.gov>) since the spring of 1995. Users may find it smoother to go directly to the JDC home page (<http://lcweb.loc.gov/rr/jdc>). Especially with expansion of access on the Internet, researchers throughout the country, and indeed throughout the world, can search the index file and identify the documents they wish to obtain. Researchers can then request the documents (e.g., through e-mail, phone, fax) from the Center by indicating the document number. The Center will make printed copies and send them out in the manner indicated by the requesters or by the most appropriate means. Currently, document delivery is by postal delivery or fax, or items are made available for pick-up in person. The Center also lists on its home page the journal titles that are subscribed. Individuals who are able to visit the Center during weekday office hours may utilize its serial and reference collection, request reference service, and view documents on screen and/or obtain copies of documents.

Other Reference Service

When the researchers cannot find all that they need in the index files and optical disks, they may ask the Japan Documentation Center for further information. The Center utilizes its reference collection and other materials of the Japanese Section's collections, and if the information is still not sufficient, the staff may fax those inquiries to the Tokyo Acquisitions Facility, where the reference librarians will search various databases, newspapers, and reports. They may contact agencies for information as well. When needed documents are obtained, the librarians send them to the Center via fax or DHL, and the Center promptly delivers them to the researcher. The Center analyzes the nature and topics of all the requests on an on-going basis to fine-tune the collection guidelines and better serve users' needs.

Because 95 percent of the JDC documents collected or requested are in Japanese, the detailed English summaries of each document in the index files are a tremendous help for the majority of users in deciding whether to request the document itself. Some users request translation at the beginning. However, translation is very costly and time-consuming; therefore the Center must carefully analyze the pattern of requests and determine how to provide both cost-effective and time-efficient provision of translations. The Center also investigates the availability of English versions or summaries of the documents as much as possible, including on the World Wide Web. The Center staff have been referring users to web sites,

particularly those maintained by Japanese government ministries and agencies. Also, if some documents are published in English at a later time, the Center informs the user of their availability for purchase.

Requests and inquiries come to the Japan Documentation Center 24 hours a day through e-mail, fax, telephone, regular postal service and, of course, in person during the normal office hours. Communication between Washington and Tokyo staff is done mainly by fax. Because of the time difference between these two locations, a fax sent out during the day from Washington is picked up in Tokyo several hours later when the Tokyo staff come to work. In many cases they respond to the fax in that day (which is during the night in Washington) and information or documents are waiting the next morning when the Center staff come to work. Although communication is also done through the Internet, document requests from the Center to the Tokyo Office are usually made by fax. Because of the time difference, people are not able to read e-mail immediately after their receipt anyway. Using the facsimile service has proven adequate, plus it has the advantage of allowing one to correspond *in Japanese* using Japanese script and conveying exact document titles or citations. Furthermore, E-mail correspondence in Japanese has not yet been implemented at the Library of Congress.

Additional JDC Activities

The Japan Documentation Center issues announcements, newsletters and papers to keep users informed about the Center, new developments in the field and related events. These announcements are issued in print form, as well as via electronic means. Center staff also take every opportunity to present papers, demonstrate the JDC database searches and disseminate information at professional and scholarly conferences and other like occasions.

In March 1994, the Center held its first symposium on "Technical Requirements for Accessing Japanese Information: Problems & Solutions,"⁶ which was attended by a capacity audience of 200. Speakers included technical specialists in Japanese communication, such as Ken R. Lunde, the author of *Nihongo Joho Shori: Understanding Japanese Information Processing*. The workshop was very favorably received and its proceedings have been requested by various specialists. The second annual JDC symposium on "Japan's Policy Making: Perspective and Resources"⁷ was held on April 24, 1995. The Center brought together an expert group of young scholars, government officials and communication specialists to present papers and discuss pertinent issues. Again, some 200 people attended, and many viewed the symposium as substantial and very informative. The third annual JDC symposium on "CyberJapan: Technology, Policy & Society" held in May 1996 drew 180

participants. Major topics included Japan's ministerial telecommunication policies and the development on Internet use in Japan. These topics, with important global implications, were discussed by the specialists from the United States, Japan and the United Kingdom. Each year, symposium proceedings are widely distributed, thereby making these timely resources available to a broad user base.

In July 1997, for the first time, the International Conference on Japanese Information in Science, Technology and Commerce was held in the United States. This biennial conference has been held since 1987, all in Europe. The Center co-sponsored the conference with the U.S. Department of Commerce's Office of Technology Policy. Thirty specialists from the U.K., France, Germany, New Zealand, Japan and the U.S. addressed technological developments, print and electronic resources, Japan's information disclosure and its implications, among other issues. The 150 participants also had the opportunity to see demonstrations of the newest software technologies, databases, and services by exhibitors.

Establishment of the JDC: Filling a Need for Japanese Information

In the early 1980s the United States Senate began to voice concern about the lack of up-to-date information relating to Japan, especially information about Japan's progress in science, technology, business and industry.⁸ Since that time, Congress has continued to clearly express the need for the most current Japanese information in broad policy areas to help shape discussion and legislation.⁹ One result was passage of the "Japanese Technical Literature Act of 1986."¹⁰ Also, calls from Executive Branch and other governmental agencies for information relating to Japan were increasing. Demand from others in academia, private sector research, business and industry, and from the general public has been growing as well.

Recognizing the growing need, the U.S. Department of Commerce commissioned two particular research projects to examine Japanese grey literature. Ichiko Morita (before coming to JDC) surveyed patterns of information flow in Japan, especially to investigate means to obtain current Japanese information, in particular grey literature, more efficiently.¹¹ One of the findings of the study, *The Current Status of Science and Technology Grey Literature in Japan* (1988), was that bibliographical control (capturing citations in indexes and abstracting sources) of this literature is handled quite differently in Japan than in the United States. In general, Japan holds this material more closely. Even for Japanese living in Japan, it is difficult to obtain such information depending on the locality where they reside, professional society to which they belong, or other factors.¹² Because of the significance of such factors, U.S. researchers often cannot successfully identify, much less obtain, Japanese

literature by applying approaches they are accustomed to using for acquiring literature here in the U.S. The flow of information reflects Japan's national characteristics, societal structures, life philosophy, and perhaps many other factors. However, it is only recently that the differences in the patterns of the flow of information have been explained in terms of those differences in national characteristics. This situation compels the researcher to spend time, effort, and money in locating relevant Japanese grey literature. Although digitization of documents is currently being planned in concert with the building of Japan's information infrastructure, such solutions remain for the future.¹³ For the present, researchers must continue to go through traditional collection methods.

Another factor hampering access is language. The English language is used more widely by the Japanese than the Japanese language is by Americans. This fact, in addition to the ease of access to the U.S. grey literature for domestic and international users, accelerated the heavily one-way stream of information from the U.S. to Japan.¹⁴

The Japanese, too, have begun to realize that the acquisition of this literature is a serious problem at home. To address these concerns, leaders in the information field in Japan have been making great efforts to improve information flows and avoid so-called "international information friction."¹⁵ The Japan Foundation has investigated the U.S. needs of such Japanese information, the results of which were published in 1990 as *A Survey on the Needs and Availability of Information on Contemporary Japan in the United States*.¹⁶ Japanese government agencies also are bringing some changes to the distribution of their literature in order to make information more easily available at home and abroad.

One of the fruitful results of such efforts in both Japan and the United States was the establishment of the Japan Documentation Center as a measure to alleviate this information imbalance.¹⁷ More specifically, the JDC was established in response to a Congressional directive to enhance the Library of Congress' Asian collections to keep Congress informed about current happenings in Japan. In 1992 the Center officially came into being, thanks to a five-year grant from the Japan Foundation's Center for Global Partnership (CGP) with approximately \$700,000 as the annual budget. After the completion of the first five year term, CGP has agreed to provide funding for further development of the Center's activities for another three years at a level of up to \$500,000 per annum.

The Future

Direct access to the Center's index file by users at locations outside the Library of Congress now being available, the next reasonable step is to make the documents themselves available over Internet. The communication technology is rapidly developing, and hopefully, it will enable the Center to expand its capabilities in the near future. More careful evaluation of possibilities and potential that these technologies bring is required. It is important to consider the ease of the user in receiving in their computer equipment Japanese documents in vernacular. The possibility of adding the full text of documents to the JDC bibliographic information already accessible on the World Wide Web through the Library's home page is also under consideration. The Center is being alert in the development of international copyright law agreement on electronically disseminated data.

One of the considerations to enhance efficiency is to have the Tokyo-based librarians transmit bibliographic information formatted for input to the Congressional Research Service online system (in which the JDC bibliographic data is maintained) directly via Internet. This would save the JDC librarians from re-keying the data to complete the processing of the records.

Another development the Center can consider utilizing is machine translation, or rather machine assisted abstracting of Japanese documents into English. Such technology has been researched. As of this writing, machine translation has been successfully applied in the areas of science and technology. When a electronic dictionary that is rich in political science and social science terms is developed, it may be feasible to utilize machine translation. At the same time, automatic abstracting is also being developed. Document texts would go through an OCR (optical character recognition) process. Although the Center does not have the funds or resources to OCR the documents at this time, it is certainly a future possibility.

Significance of Information Management Practices in the Center

An unique characteristic of the Center is its nature as a cooperative venture of the Center for Global Partnership of the Japan Foundation and the Library of Congress. This is the first arrangement of its kind, and has only been made possible with a commitment of funding together with a vision of possibilities to improve global information flows. Furthermore, the success of the project has depended on the support of the national libraries of both the United States and Japan, and its effectiveness has been further enhanced by substantial support of many Japanese organizations.

It is also significant in that the Center was established with a special role in mind -- to fulfill the need for access to the most up-to-date Japanese information in defined areas. Although the Center is located in the largest research library of the world, it functions as a small "special library" and its staff efficiently provide specific types and forms of information .

The Center is yet young to fully assess its effectiveness. However, the approach for managing the information appears to be efficient and effective for the purposes it serves. How appropriate the structure is can be proven only when the further improvements and refinements cited here are made. Therefore, the Center must still be considered a prototype with potential applications in other areas and in other institutions.

There have been many projects in cooperative acquisition and sharing of resources in order to avoid redundancy among many libraries. However, in most cases, these ventures have been confined to libraries within one nation. The concept of the Japan Documentation Center extends the idea to a truly international basis, which -- because electronic transmission of information removes limitations of time and distance -- is a new world. If users from overseas, including people in Japan, can request information on Japan from Washington as if they were using the Japan National Diet Library, we know we will have succeeded! The potential to bring it to us all is very great.

1. Ichiko T. Morita. *The Current Status of Science and Technology Grey Literature in Japan* (Springfield, Va.: National Technical Information Service, Office of International Affairs, 1988), 1, NTIS, PB88-227780.
2. Seiko Hayashi, "Chōsa Kenkyū ni okeru Haiiro Bunken no Riyō [Using Grey Literature in a Comprehensive Research Institution]," *Jōhō Kanri* [Journal of Information Processing and Management] 37 (March 1995): 1098.
3. Takeyoshi Hanada. "Haiiro no Bunken: Sono Shurui to Mondai [Grey Literature: Its Types and Problems]," *Jōhō Kanri* [Journal of Information Processing and Management] 27 (Oct. 1984): 595.
4. Ichiko Morita. "Japan Documentation Center: Setsuritsu no Haikei to Genjō, Sarani sono Shōrai Nado [The Japan Documentation Center: Background for Its Establishment, Present and Future]," *Jōhō no Kagaku to Gijutsu* [Journal of Information Science and Technology Association] 45 (March 1995): 124.
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6. U.S. Library of Congress. Japan Documentation Center. *Technical Requirements for Accessing Japanese Information: Problems & Solutions*, Library of Congress, Washington, D.C., March 18, 1994, (Springfield, VA: Department of Commerce, NTIS, 1994) PB94-127925.
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8. "U.S. Congress, The Availability of Japanese Scientific and Technical Information in the United States, Hearings before the Subcommittee on Science, Research and Technology of the Committee on Science and Technology, House of Representatives, 98th Congress, 2nd Session, March 6, 7, 1984, Washington D.C., pp407" quoted in Takayasu Miyakawa and Makiko Miwa, *Kokusai Jōhō Masatsu: Nihon Jōhō ga Te ni Hairanai* [International Information Friction: Japanese Information is Unobtainable] (Tokyo: Nihon Keizai Shimbunsha, 1989): 321.
9. Miyakawa, 57.
10. Yuiko Teramura. "Kagaku Gijutsu Jōhō Seisaku no Nichibei Hikaku: Sengo 45nen no Kiseki [Comparison of Science and Technology Information Policies between Japan and the United States: History of 45 Years After the War],"

Referensu [Reference] 500 (September 1992): 24.

11. Morita's study covered science and technology in general, while Ruhl's is more narrowly focused. Mary Jane Ruhl. *Identifying and Acquiring Grey Literature in Japan on High-Definition Television (HDTV) for the National Technical Information Service* (Springfield, VA.: National Technical Information Service, Office of International Affairs, 1989). NTIS, PB90-135302. See also Teramura, *Referensu* 500: 25.

12. Morita, *Current Status*, 9.

13. Japan. Ministry of International Trade and Industry, "Program for Advanced Information Infrastructure" (Tokyo: the Ministry, 1994), 58.

14. Japan Foundation, *Beikoku ni Okeru Gendai Nihon Jōhō no Jukyū no Genjō. A Survey on the Needs and Availability of Information on Contemporary Japan in the United States* (Tokyo: the Foundation, 1990), ii. This report is published in Japanese only.

15. Miyakawa, *Kokusai Jōhō Masatsu*, 253.

16. Japan Foundation, 3.

17. Jun-etsu Komatsu. "Hirakareta Nihon o: Beikoku Gikai Toshokan Nihon Jōhō Shiryō Sentā [Toward the Unsealed Japan: U.S. Library of Congress, Japan Documentation Center]" *Kokusai Kōryū* [International Exchange] 67 (1995): 6.

Grey documents in AGRIS and the non-conventional document supply by AGRIS and AGLINET

Introduction

Definition of non-conventional literature

What is AGLINET?

The non-conventional documents in AGLINET

What is AGRIS?

The non-conventional documents in AGRIS

Conclusions

The aim of my participation at this meeting is to provide information about the two networks pertaining to agriculture for which I have been working for the past 18 years. One is the network of agricultural libraries AGLINET and the second the AGRIS centres which collaborate in compiling the world bibliographic data base of the same name.

First of all I would like to present these two networks and then to emphasize their role in providing access to grey or non-conventional literature.

I shall start by explaining what is meant by "non-conventional literature" within these two networks. The following quotation is taken from the indexing guide for AGRIS (edited by the Coordinating Centre for AGRIS at the FAO in August 1979).

Definition of "non-conventional" at the FAO (Food and Agriculture Organization, pertaining to the United Nations family)

Non-conventional literature refers to all types of material not available through normal distribution channels, and generally difficult to locate. Non-conventional literature includes documents produced by government departments, international organisations, research stations, commercial consultants and universities and not by recognised publishing houses. These documents are often produced in limited quantities and may be supplied free, at cost price, or on a purely consultant-to-client basis. A special library would tend to apply directly to the producer for this literature rather than to a book-supply agency. Material from non-conventional literature producers in developed countries is often more readily available and better publicised, so that it enters a marginal area between conventional and non-conventional.

However, to ensure maximum availability of documentary units to AGRIS users, where the decision to class a document as conventional or non-conventional is not clear, it is recommended that such documents be classified as non-conventional.

A note specifies that some document types are by definition "conventional" even if difficult to locate because they are covered by copyright and may not be microfilmed, e.g. patents, standards, computer media.

AGRIS uses the concept of "non-conventional" literature to ensure that originals or copies of non-conventional documents are available to AGRIS users.

Therefore whenever the specific tag in AGRIS is used for a non-conventional document, at least one copy of this document should be kept at the AGRIS input Centre to be made available to AGRIS participants on request. Or if the document is not available at the Input Center but at another institution a statement to indicate this fact must be entered in a specific field.

What is AGLINET?

AGLINET is a network of large and medium sized agricultural libraries voluntarily formed within the framework of the International Association of Agricultural Librarians and Documentalists (IAALD) for the purpose of promoting mutual and rational exploitation of library resources through systematic collaboration among agricultural libraries for the efficient provision of an inter library loan service and bibliographic information.

In 1974, 17 participating libraries joined AGLINET, today 46 agricultural libraries and thematic centers, all over the world, participate in the network. The AGLINET International Centre, located at the David Lubin Memorial Library of the FAO in Rome, edits a Union List of Serials held in participating libraries and more frequently cited in AGRIS.

The non-conventional literature and AGLINET

The major part of serials of the Union List of serials are conventional; but some even with an ISSN are to be considered as non-conventional, because of their poor diffusion, both in the USA for local irregular proceedings or miscellaneous as well as in developing countries with political and currency problems. The Union List contained in 1985 more than 6000 titles out of the 12 000 titles estimated in the scope of agriculture.

The system is based on reciprocal services. The photocopies or microforms are provided free of charge and as fast as possible (one week maximum) between the participating libraries.

What is AGRIS?

AGRIS is the International Information System for Agricultural Sciences and Technology. Created in 1974 by FAO within the framework of the International Association of Agricultural Librarians and Documentalists (IAALD) to facilitate information exchange, AGRIS identifies world literature dealing with all aspects of agriculture: mainly plant and animal production and protection, forestry, fisheries, agricultural engineering, environment, food, human nutrition, agricultural economics and rural development.

AGRIS collects bibliographic references to materials which may be either conventional (journal articles, books) or non-conventional, e.g. theses, reports etc., not available through normal commercial channels.

July,
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Accession
List

Since 1975, when the system became operational, AGRIS has accumulated a database of more than 2.5 million references. The data forwarded by participating countries is processed in Vienna at the AGRIS Processing unit which is hosted, under contractual agreement, by the Division of Scientific and Technical Information of the IAEA (International Agency for Atomic Energy)

Acronyms
List

AGRIS is a cooperative system in which participating countries input references to the literature produced within their boundaries and, in return, draw on the information provided by the other participants. 164 national and 36 international or regional centers participate and submit about 14 000 items per month. The system is managed by the AGRIS/CARIS Coordinating Group, Library and Documentation System Division, FAO, Rome.

AGRIS is made available to users mainly in the following ways:

- on the CD-ROM covering 1975 to present (update quarterly), available from SilverPlatter.
- on-line access to the global data base provided by a number of hosts: Knight Ridder, ex-DIALOG, now the Dialog Corporation (Palo Alto, non-US portion only) and DIMDI (Cologne)

The non-conventional literature in AGRIS

Since the creation of AGRIS, a special indicator "V" is placed to designate the non-conventional literature in the base; at the same time a special field has to be completed with the address of the center where the document is available, which is generally the address of the input center itself.

As we have already said, AGRIS data base registered over 2,5 millions bibliographic references of which 20 per cent are labeled as non-conventional (i.e. 500 000 references).

In order to evaluate the geographical distribution of the AGRIS grey literature we performed an investigation on 4 AGRIS CD-ROM from 1989 to 1996 (8 years). The search formulation was:

"V" (non-conventional) in the field publication type AND "name of the country" in the field country input

We used 164 country names and 36 international centers participating in AGRIS. We obtained a 200 lines table with the global input and the non-conventional items by period of two years.

We globalized the total input of 8 years, the non-conventional input and the percentage of non-conventional versus total input.

1. 22 national centers have been inactive, 95 provided descriptions very irregularly. Some Central and Eastern European countries have not been taken into consideration, because they did not constitute an independent unit before 1990 (Czech Republic, Slovakia, Slovenia, the Baltic States, Belarusia) during the period under consideration.

2. A number of countries or international centers never mention non-conventional documents in their entries (Japan, Korea, Vietnam, China, Iran, Bulgaria, Romania, Greece)

3. A number of countries or international centers mention almost only non-conventional literature (Turkey, Tunisia, Algeria, Cote d'Ivoire, Senegal, Sudan, Cyprus, El Salvador, Nicaragua, Panama, Paraguay, Peru, Colombia, Barbados, Rwanda, Burundi, Burkina Faso, Thailand, Honduras, ICRISAT (International Crop Research Institute for the Semi-Arid Tropics))

4. Most of the countries and international centers send descriptions of conventional and non-conventional documents in various proportions.

We have taken into account the centres which, during the period considered (1989 - 1996), provided descriptions at least three times during the two year periods (1989 - 1990; 1991 - 1992; 1993 - 1994; 1995 - 1996). These centres are listed in the table below, grouped by continent. The FAO and the USA are set aside.

centres	total number of entries CD-ROM 1989 - 1996	non-conventional documents	%
FAO	36 581	22 582	62
USA	350 358	32 499	9

REGIONAL AND INTERNATIONAL INSTITUTIONS

AOAD (Arab Organ. for Agric. Dev.)	408	408	100
CIAT (Cent. Int. de Agric. Trop.)	2 660	1 073	40
CIHEAM (Cent. int. de hautes etud. agron. med.)	1 131	263	23
ICARDA (Int. Cent. for Agric. Res. in Dry Areas)	1 567	864	53
ICRAF (Int. Cent. for Res. in Agroforestry)	216	39	8
ICRISAT Int. Crop res. Inst. for the Semi-Arid Tropics)	762	761	100
IICA (Inter-American Inst. for Coop. on Agric.)	814	759	93
ILRI (Int. Livestock Res. Inst.)	695	50	7

EUROPE

Belgium	12 507	3 227	26
Bulgaria	3 705	-	

Cyprus	183	181	100
Denmark	14 473	800	6
Finland	2 070	14	1
France	59 265	3 769	6
Germany	98 746	7 712	3
Greece	935	-	
Hungary	3 297	7	-1
Italy	22 980	405	2
Netherlands	44 117	2 460	6
Norway	2 370	239	10
Poland	9 086	239	3
Portugal	2 953	1 842	62
Romania	2 004	-	
Russian Federation	4 197	610	15
Spain	14 969	76	1
Sweden	19 780	11 047	46
Switzerland	4 037	129	3
United Kingdom	96 355	936	1
Yugoslavia	5 310	170	3

AFRICA

Algeria	1 120	1 112	99
Burkina Faso	78	71	90
Burundi	546	546	100
Chad	44	27	61
Cote d'Ivoire	225	224	100
Egypt	16 719	3 680	22
Ethiopia	756	198	26
Ghana	403	300	74
Kenya	356	299	89
Madagascar	126	99	79
Nigeria	309	3	1
Rwanda	477	477	100
Senegal	313	296	95
Sudan	411	304	74
Tunisia	228	175	77
Zimbabwe	274	113	41

CENTRAL AND LATIN AMERICA

Argentina	963	737	77
Barbados	106	97	92
Brazil	8 513	2 584	30
Chile	5 202	2 868	55
Colombia	1 177	1 146	97
Costa Rica	2 011	774	38
Cuba	5 755	875	15
Dominica	309	68	22
El Salvador	226	221	98
Guyana	213	193	83

Haiti	115	100	87
Honduras	149	149	100
Jamaica	166	115	69
Mexico	6 574	5 514	84
Morocco	3 410	1 797	53
Nicaragua	362	352	97
Panama	908	904	100
Paraguay	71	63	
89			
Peru	1 376	1 237	90
Trinidad	1 396	763	55
Venezuela	670	538	80

ASIA

Bangladesh	2 886	36	1
China	41 080	-	
Indonesia	5 913	381	6
India	7 880	11	-1
Iran	537	-	
Iraq	561	215	38
Israel	774	130	17
Japan	47 834	-	
Jordan	406	260	64
Korea	20 534	-	
Lebanon	485	309	64
Malaysia	3 879	354	9
Pakistan	5 892	2 117	36
Philippines	14 279	5 769	40
Sri Lanka	1 443	1 031	71
Thailand	7 737	6 162	80
Vietnam	1 461	-	

If we pool the results of the detailed data , we can establish two big categories:

CONTINENT	NUMBER OF INPUT CENTERS	
	>20%	non-conventional 20 - 100%
Europe	17	4
Africa	1	15
Asia	9	8
Central and Latin America	-	21
Int. and reg. cen.	2	6
USA		FAO

Analysis of this table indicates that :

- the majority of European countries and the USA provide less than 20% of descriptions of non-conventional literature,

- the FAO, countries in Africa, Central and Latin America and regional and international Centres provide from 20 to 100% of the descriptions of non-conventional literature,

- countries in Asia lie between the two. Half come into the first group (>20%), with 5 of them never providing descriptions of non-conventional literature. The other half fits into the 20 - 100% group of non-conventional literature.

Comments and conclusions

The European countries and the USA offer sufficient possibilities for scientists to publish the results of their works in commercial publications, whether in journals or monographies.

Only the works of governmental research centres, seminar proceedings not published by commercial publishing houses and PhD theses are presented under the non-conventional tag.

The numerical importance of this type of document depends greatly on the willingness of the centres to inventory them, for their cataloguing often presents problems and a description entails their conservation by the centre in order to provide photocopies if requested.

Countries in Africa and Central and Latin America are the complete opposite and it would be interesting to check to what extent scientists in these countries publish in commercial journals abroad.

As for the FAO and the regional and international Centres, they belong to the category of principal suppliers of non-conventional literature, due to the high number of internal and intermediary reports, as well as to their vocation to assist developing countries.

Publications coming from developing countries should be classified as non-conventional as long as these countries do not have publishing houses represented abroad.

The case of Asian countries is particular. The non indication of non-conventional literature is probably not due to the absence of the latter but rather to a decision by the centres, either not to introduce into the bases documents written in national languages, understandable only to nationals, or to respect political or technological confidentiality.

Availability of these documents could be increased by the creation of a centralised clearing house for this literature but a number of practical problems - sufficient storage space, physical quality of the presentation of these documents and the cost of the operation - have impeded further development.

Modern technologies - numerisation and on-line access could in part solve this problem. However, this solution does not exclude the need for building up a good centralised bibliography of non-conventional documents, such as that constituted by AGRIS.

In the field of agricultural documentation access to non-conventional literature depends on the description of these items in the bibliographic data base AGRIS. The entry in the data base depends on the policy and willingness of the input centre or of the national authorities.

But if the description is given, the AGRIS system together with AGLINET offers a fair chance of obtaining (free of charge) a copy of the document within a reasonable time.

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THE PROJECT DEGREE
Dissemination of Electronic GREy files on Economics

by

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Tilburg University Library

*Accounting
List*

Abstract

Between July 1996 and July 1997 seven Dutch universities were involved in the project **DEGREE** (Dissemination of Electronic GREy files on Economics). Objectives of the project were: electronic production, disclosure and availability via WWW of full text working papers on economics and business economics.

Procedures and formats were analyzed, discussed and established.

This joint effort resulted in a national WWW homepage for working papers on economics, where the full text papers can be retrieved.

The URL of DEGREE is: <http://cwis.kub.nl/~dbi/degree/>

Structural continuation of the project is based on a gentlemen's agreement between the DEGREE participants.

In an international scope, cooperation with RePEc is established.

This paper will describe the way in which the project DEGREE was set up, carried out and build into an interesting WWW site.

Introduction

The distribution of working papers may change significantly in a fully networked world. By taking full advantage of information technology, the flow of information can be improved. Since libraries are well equipped for this task, it figures to expand their traditional roles of intermediaries between authors of documents and users of documents to the electronic world. The DEGREE project has succeeded in realizing this for the Netherlands.

The project DEGREE

DEGREE is a Dutch project supported by IWI, a steering committee for Innovation in Scientific Information Provision. IWI is a committee of the SURF Foundation, a cooperative organisation for the advancement of computer services in higher education and scientific research in the Netherlands.

The project started in July 1996 and was successfully ended after one year.

Libraries from seven Dutch universities were involved: University of Amsterdam, Free University of Maastricht, University of Groningen, Erasmus University Rotterdam, University Maastricht and Tilburg University. The latter coordinated the project.

Every university library appointed a member of the project group. Besides meetings, an electronic discussion list was used to communicate within this group.

As a general objective DEGREE aims at optimizing the dissemination of working papers on economics and business economics. In order to achieve this goal, the following items had to be worked on:

1. Production and WWW availability of full text working papers on economics and business economics;
2. Cataloguing and subject indexing of electronic working papers;
3. Realization of the former two objectives in an "open model", in order to make it possible for other organizations to cooperate in the same way.

The developments and results for each part of the project DEGREE are as follows.

1. Production and WWW availability

First of all, it was determined that only serial working papers on economics and business economics, issued by an organization would be included in the project. Like this, the responsibility for quality and continuity of working papers remains in the hands of the institute/faculty.

Although matters of copyright for electronic papers are similar to printed working papers, there are scientists who fear the negative reaction of journal publishers. Especially in the field of business economics authors are reluctant to publish their working paper electronically. It is, therefore, good to be prepared for discussions on this matter both with authors and with publishers. Our experience on this point is very reassuring, since, during the course of the project, it only happened once that an author was told by the publisher of his journal article, not to make his working paper available via WWW.

It is realistic to assume that most of the current papers are produced by means of computer; economists generally use WordPerfect, Word, LaTeX, etc. In the DEGREE project these different files are made available on the Internet in PostScript and Acrobat PDF. Viewers for PostScript and PDF are available for free on the Internet. Very few authors submit their paper in HTML; hopefully their number will grow in time.

The electronic papers are stored on a (part of a) local WWW server.

The matter of storage period has not been dealt with in this project, but surely this problem must be handled in the future. Important questions like "where must older papers be stored, in every university or at a central location?", "what happens to outdated formats?", etc. still have to be answered.

There is no general procedure for the realisation of the above mentioned production of electronic working papers and their accessibility on the Internet. Due to a variety of organization structures in every university, matters of responsibilities and rules differ from place to place. It is essential to have a good view on one's own situation concerning regulations for the production and WWW availability of electronic papers.

Therefore on all seven universities, a working group was established in order to get things organized at home in a way that suits the local situation best.

As a result, the production of electronic working papers has developed in various ways for the DEGREE partners. This shows on the different WWW homepages, where, after one year, the amount of full text available papers was as follows:

Erasmus University Rotterdam: http://www.eur.nl/WebDOC/doc/	142 working papers
Tilburg University: http://greywww.kub.nl:2080/greyfiles/	319 working papers
University Groningen: http://docserver.ub.rug.nl/eldoc/som/index.html	66 working papers
University Maastricht: http://www-edocs.unimaas.nl/~document/fdewb.htm	166 working papers
University of Amsterdam: http://www.fee.uva.nl/bieb/edocs.htm	49 working papers
Free University of Amsterdam: http://pc038.uvu.vu.nl/afdeling/economie/memoranda/	3 working papers
Nijenrode University:	2 working papers

<http://www.nijenrode.nl/library/publications/nijenrode.html>

In order to evaluate procedures and products, a number of authors, library users, library staff and faculty staff were interviewed. This resulted in some useful remarks which enabled us to improve the DEGREE website, local websites and local procedures.

2. Cataloguing and subject indexing of electronic working papers

It was very tempting to catalogue electronic working papers in the same way as printed versions are. But for a virtual collection of papers, it is more appropriate to use a virtual way of cataloguing. Advantages are: decentralization of cataloguing activities, sharing bibliographic data, possibility to use data in a local database. Based on international developments in this field, a DEGREE format for bibliographic data was decided upon and a DEGREE archive was established on a WWW server at Tilburg University Library. There, bibliographic records are converted into the DEGREE database, which is accessible for free via the DEGREE Internet homepage. All of these activities are executed without charging or paying anyone of the DEGREE partners; self-interest is the best motivation in this case.

As far as subject indexing by keywords is concerned, Tilburg University Library uses the "Attent Thesaurus", which is locally designed and maintained, and specialized in economics and business economics, including relevant mathematical keywords. Nijenrode University Library uses the "SCIMP/SCANP thesaurus", specialized in business economics. The other partners use uncontrolled keywords.

The bibliographic records contain abstracts as far as they are provided by authors. Since this is mostly the case and the DEGREE database can be searched by abstract words, this too is a fine way of retrieving working papers by subject.

There is no option for full text searching in the DEGREE database.

3. Open model

To prevent us from re-inventing the wheel, the Internet was scanned on comparable initiatives. The following Internet sites were examined: WoPEc, EconWPA, ERN. Soon it became clear that the organization behind WoPEc had the same objectives as DEGREE. In fact the two projects are complementary: DEGREE organizes a national archive which becomes part of the international RePEc archive in England. We contacted the initiator of WoPEc at University of Surrey, who was very pleased with the DEGREE project, since at that very moment he was studying on a better way of shared cataloguing for electronic working papers on economics and business economics. By mutual agreement, general procedures for the availability of bibliographic records in archives were established in the "Guildford Protocol". The idea is to create bibliographic record archives which can be mirrored by anyone who needs them for a database.

So far, the following archives, containing bibliographic data of electronic working papers on economics and business economics, are included in the RePEc archive:

- Boston College
- Bonn University
- London School of Economics, Centre for Economic Performance
- London School of Economics, Financial Markets Group
- Centre for Economic Policy Research
- DEGREE
- De Montfort University, School of Social Sciences
- Centre for Economic Learning and Social Evolution
- S-WoPEc, Swedish Working Papers in Economics
- Economic Working Paper Archive at University of Jena
- National Bureau of Economic Research
- Universidad de Valencia, Facultad de Ciencias Economicas

Only two of the above listed archives are national archives (S-WoPEc and DEGREE). The rest are organizational archives.

National archives provide a solid structure to facilitate the dissemination of electronic working papers. In the Netherlands, this is set up according to the DEGREE model.

DEGREE model

The DEGREE model is designed for working papers on economics and business economics, but can be used in other disciplines or for other documents, provided that similar conditions apply.

Content:

1. Conditions for participation in DEGREE
2. Organization on a local level
3. Organization on a national level
4. Production of electronic working papers
5. Bibliographical description of electronic working papers
6. International cooperation
7. Checklist

1. Conditions for participation in DEGREE

Three conditions apply:

- There is a series of working papers on economics and/or business economics, published by an institution or faculty. Individual papers, not issues as a series, are not included.
The set-up and peer review of such a series is taken for granted and only the electronic dissemination of the papers has to be organized.
- The working papers are copyright free; the institute or faculty gives permission to make the full text of the documents available on the Internet.
- A WWW (World Wide Web) server is available to store the full text documents.

2. Organization on a local level

Management level

The decision to make working papers available on the Internet has to be made by at the management level of both library and institute or faculty. Like this, the new service fits in the organizational structure and can become a part of the regular tasks of the staff, after a plan of action is drawn up.

Library

Required working hours for this new library service are estimated. Tasks and responsibilities are assigned to the staff. Handling procedures for electronic working papers are set up.

Institute/Faculty

Authors are notified to submit their paper in electronic form, in a specific format. Since assistance may be requested, secretaries and computer staff also have to be instructed. Regular communication between library and institute/faculty to monitor the start-up problems of the production is advisable.

3. Organization on a national level

The DEGREE project aims at the decentralization of tasks and responsibilities as much as possible. The idea is that the most concerned party will make the most effort to carry out those tasks in the best way. According to this principle, DEGREE participants are responsible for the production, WWW availability and disclosure of their own working papers.

Full text electronic working papers are located on a local WWW server and made available via the Internet.

Bibliographic data, according to the DEGREE template, are kept in a specific WWW directory, which is accessible to the Tilburg University Library. This library mirrors the directories of all the DEGREE partners and, as such, collects the bibliographic records in an archive.

The Tilburg University Library converts the bibliographic DEGREE records to the "DEGREE database", which is accessible at no charge via the DEGREE home page. The Tilburg University library maintains the DEGREE home page, as well as the DEGREE database.

4. Procedures for the production of working papers

It is realistic to assume that working papers are already produced electronically, albeit with different word processing systems.

Format

Original files, besides HTML documents, have to be converted into a page documentation language like PostScript or Acrobat PDF (Portable Document Format). In order to be prepared for this, an inventory of the different word processing systems which are used for the production of working papers in the institution/faculty has to be made. One must be aware that choosing a format entails providing adequate software and hardware, and relevant instructions to one's own (library) users.

Submission of papers

The author can submit his/her electronic working paper in various ways to the person responsible for storing it on the WWW server: e-mail, floppy, FTP (File Transport Protocol). When making a choice, it is important that the documents and related information (read me files) are transferred undamaged.

Automatic software to create PostScript or PDF file from original documents must be available.

Problems

Authors sometimes dislike the fact that they aren't allowed to deliver their document in the original format. However, it would be too cumbersome for the library to convert every original document into PostScript or PDF. As it is in the author's own interest to have his/her document distributed via the Internet, he/she may be expected to make this extra effort.

When authors use (SWP) Scientific WorkPlace to produce a paper, problems may occur during conversion to PostScript, due to the use of fonts which are not recognized by PostScript. No adequate solution for this problem has yet been found. Tilburg University has proposed a make-shift solution.

(see: http://cwis.kub.nl/~dbi/cwis/elib/greyfile/guide/tex_pdfu.htm#WWP).

5. Procedures for the bibliographical description of working papers

Similar to the production, DEGREE partners are responsible for the cataloguing and subject indexing of their own electronic working papers. These bibliographic records, collected in the DEGREE archive, are available to the world. The DEGREE format for bibliographic records contains the following fields (Tilburg University paper as an example):

Template-type: ReDIF-Paper 1.0

Author-Name: Aalbers,R

Author-Email: wlang@lsuvm.sncc.lsu.edu

Author-Workplace-Name: Tilburg University, Center for Economic Research

Title: Extinction of the Human Race : Doom-Mongering or Reality ?

Abstract: This is the abstract of the document. Although you do not need to have an abstract, we strongly recommend a detailed abstract, because it increases the chance of users finding your document within a database. If you have a long abstract that has several paragraphs please split the paragraphs by html <p>sequence.

Classification-JEL: Q29

Keywords-Attent: Pollution; Sustainable Development;

Keywords: Life support system; Overendowment tax

Series: Discussion Paper

Creation-Date: 1994

Number: 102

File-URL: <http://greywww.kub.nl:2080/greyfiles/center/1994/doc/102.ps>

File-Format: application/postscript

File-Size: 962 Kb

File-URL: <http://greywww.kub.nl:2080/greyfiles/center/1994/doc/102.pdf>

File-Format: application/pdf

File-Size: 399 Kb

Handle: RePEc:dgr:kubcen:1994108

6. International cooperation

A model of cooperation for working papers in economics, named RePEc (Research Papers in Economics) has been developed on an international level. The initiator is Thomas Krichel, an economic scientist at Surrey University. In cooperation with Sweden, Spain, and the Netherlands, the Guildford Protocol has been established. This protocol describes the bibliographic data exchange between RePEc partners.

Like DEGREE, the RePEc cooperation model endorses a decentralized organization of tasks and responsibilities. Participants make their electronic publications available on the Internet and consequently release their bibliographic records. The latter are collected within the RePEc archive and retrievable through WoPEc, an international site for working papers on economics and business economics.

DEGREE participates in RePEc as follows:

- all DEGREE participants make their full text electronic documents available via the Internet;
- each DEGREE participant provides bibliographic data on their documents according to the DEGREE template;
- those bibliographic records are located in a specific directory on a WWW server;
- Tilburg University Library has permission to mirror this directory;
- Tilburg University Library weekly mirrors the partners' directories into the DEGREE archive on its WWW server;
- RePEc regularly mirrors this DEGREE archive.

7. Checklist for candidate DEGREE partners

- a. Does your organization issue serial working papers in economics or business economics?
- b. Is your organization willing to make these working papers available via the Internet?
- c. Is there a WWW server available to store the full text working papers?
- d. Has the format(s) of the working papers on the Internet been decided upon?
- e. Is all the necessary software and hardware available?
- f. Is there a plan of action for this new service and are procedures set up?
- g. Has the DEGREE coordinator been notified about your intention to participate in DEGREE and what series are going to be included?
- h. Do you agree to use the DEGREE template for bibliographic records of your working papers?
- i. Has a WWW directory been created to store the bibliographic records?
- j. Does the Tilburg University Library have access to this directory?

If all of the above questions can be answered positively, the process leading to the availability of your working papers on the Internet can start. Your working papers will be retrievable via the DEGREE home page (national) and the WoPEc home page (international).

Conclusion

DEGREE is a fine example of a national network to improve the flow of information captured in working papers. Organizing this on a national level is a logical step before entering an international network; commitment of participants is higher and communication is more personal and direct ("Like knows like!")

The development of similar bibliographic archives in other countries would improve the number of working paper series covered in the RePEc archive and, thus, optimize the dissemination of electronic working papers on economics and business economics.

List of mentioned Internet sites

DEGREE

<http://cwis.kub.nl/~dbi/degree/>

RePEc

<http://cs6400.mcc.ac.uk/~adnetec/RePEc/RePEc.html>

Guildford Protocol

<http://cs6400.mcc.ac.uk/~adnetec/RePEc/GuilP.html>

WoPEc

<http://netec.mcc.ac.uk/~adnetec/WoPEc/WoPEc.html>

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Information services and publications on science and technology in Poland

K. Siwek

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Abstract

The Information Processing Centre (OPI) in Warsaw maintains information services on documents called „grey literature” as a continuation of the former Centre for Scientific, Technical and Economical Information activities.

Information collections produced and conducted in OPI cover databases and publications on research projects and results, doctoral dissertations, catalogues on academic and RTD institutions, researchers and experts. It conducts referral system on library and information units and on databnases on RTD accessible in Poland.

From beginning of 1997 OPI is a coordination unit of the FEMIRC (Fellow Member to the Community Innovation Relay Centres) in Poland - the INCO-Copernicus project aimed to increasing RTD international co-operation with European Union and technology transfer. It seems to be a great advantage for redesigning information services on grey literature in area of research and innovation.

1. INFORMATION PROCESSING CENTRE

The Information Processing Centre (OPI) is the main organization in Poland responsible for managing information on grey literature in area of research and development. It is a unit aimed at gathering and supplying information on and for Polish science. The information collections produced and maintained in OPI cover data related to products of science, personnel and organizations. OPI is the database vendor and publishing house related to scientific institutions, research establishments and universities, scientists and researchers as well as the research works and enterprises. The essential task of the OPI is to provide services in the area of science and that of the applications of the scientific research results. OPI is affiliated to the State Committee for Scientific Research in Poland (KBN) and it supplies due services related to science policy for appropriate KBN departments and for other governmental and nongovernmental bodies as well.

At present, OPI operates nationwide databases in Polish and English version as SYNABA - research projects and results and DOKTORATY I HABILITACJE (Dissertations Database), databases on R & D institutions and researchers.

2. HISTORICAL BACKGROUND

The National System of Scientific, Technical and Economic Information in Poland (SINTO) used to be a part of the International System of Scientific, Technical and Economic Information of the former communist countries with the central unit in

- publication issued
- research workers holding the titles of professor and other academic degrees

Who is Who in Polish Science - SCIENTISTS AND RESEARCHERS database stores data on scientific workers. At present, the database contains information on 20 thousand professors and doctors habilitati and on 40 thousand doctors.

6. THE OTHER DATABASES AND SERVICES

Additionally, there is conducted database on learned societies and foundations, database on science policy bodies, database on Polish scientists abroad. National Citation Report for Poland (from ISI - Philadelphia, USA) is the database on publications and citations of Polish authors.

The Referral Information System consists of two databases: INFORMATION CENTRES and DATABASES ON R&D ACCESSIBLE IN POLAND.

„Computerized Databases on Science and Technology” („Komputerowe Bazy Danych o Nauce i Technice”) directory published by Information Processing Centre includes 650 positions. These are descriptions of domestic and foreign databases - both bibliographic and factual, possessed and managed in over 300 scientific and information institutions in Poland. Some of them are accessible via computer network.

All above mentioned databases managed in Information Processing Centre are valuable sources of nation wide information on achievements and gaps in the Polish science - on institutional and personal ranking, in all domains and separate disciplines, what is the main point of interest for government agencies for science policy such as the State Committee for Scientific Research. On the other hand, information services provided by OPI are highly evaluated by average users for their relatively satisfactory completeness and currentness.

7. FEMIRC IN POLAND

A wide scope of databases and information services related to grey literature issues is conducted in framework of INCO-Copernicus programme project called „Creation and Development of the Fellow Member to Community Innovation Relay Centres in Poland - FEMIRC in Poland”.

Main activities of IRC in Poland are information services and consultancy on Community RTD activities as dissemination of information on European Communities programmes, accessing EU RTD databases via computer networks, advice and assistance for the submission of proposals to community RTD programmes. Technology transfer and innovation activities are promotion of innovation and technology transfer, assistance and advice, training on technology marketing and intellectual property rights, managing factual databases on technologies and institutions and experts involved in technology transfer process. Information services (state of art reports, analyses of trends etc., editorial services) for the State Committee for Scientific Research and for the Technology Agency produced by OPI will be provided in framework of FEMIRC project as well.

The Fellow Member to Community Innovation Relay Centres (FEMIRC) takes advantage of the mixture of tradition of engineering schools and craft in Poland and modern technology achievements of Polish scientists and engineers, who take a very active part in the transformation process. Intellectual potential of S&T sector in Poland is substantial, but industry does not make full use of it. On the other hand, as a result of structural transformations, private sector of industry is growing. Great number of new companies try to find their position on the inner market, which gradually becomes more open for competition. The only secure way for such companies to survive is getting maximal advantage of new technologies and innovations.

Effective infrastructure for distributing information and advice is very important for exploitation and development of industrial potential. Since future of Polish industry lies in the unification with the EU standards, in the establishment and further development of Europe-oriented economy on a high technological level, technology transfer and innovation services are indispensable element of the transformation process.

FEMIRCs are one of actions for implementation of the Information Society and as one of the seven awareness actions so they are involved deeply in building global information society, together with such initiatives as Global Inventory Project and many others awareness, economy oriented and actions of general interest. Grey Literature Network has very similar aims and its impact in increasing and enlarging international co-operation in the field of scientific information is substantial. Information Processing Centre is going to be an active partner in many Information Society initiatives, in framework of FEMIRC and in Grey Literature Network as well.

8. PARTNERS, CLIENTS AND USERS

A very important precondition of the FEMIRC is necessity to cover the whole territory of Poland. In order to satisfy it the consortium has been established. The FEMIRC in Poland consists of the following members: Information Processing Centre (OPI), Hi-Tech Co. Ltd., Warsaw University of Technology, Faculty of Production Engineering (IMIK), Poznań Science and Technology Park (PSTP) of Adam Mickiewicz University Foundation, Wrocław Centre for Technology Transfer (WCTT) of Technical University of Wrocław, Cracow University of Technology (CUT), „Incubator” Foundation and Gdańsk Centre of Technology Transfer (CTT). The Twin Partner of FEMIRC is BRIST in Paris, France.

The main and associated partners of the FEMIRC have direct contacts to numerous existing and newly developing SMEs companies as well as indirect ones through Chambers of Commerce and Industry, Industrial Associations, local and central governmental agencies. The FEMIRC plans its operational framework within the general structure of services that will facilitate the participation of Polish organisations in Community RTD programmes and contribute to the creation of an infrastructure for technology transfer in Poland and CCE.

The FEMIRC in Poland acts as an advisor and intermediary between the technology-oriented Polish companies and the possibility of technology and science transfer from and to the EU, initiator and moderator for activities aimed towards preparing and accompanying projects on the other.

Information Processing Centre is going in the framework of FEMIRC to co-operate with institutions, organizations and programmes focused on similar aims in producing and disseminating information services on grey literature as research reports, technology tenders etc.

1) EURO INFO Correspondence Centre, Poland, affiliated to Co-operation Found (Fundusz Współpracy) and develops consultancy and information tasks for Polish SME's. EURO INFO Centre and its focal points in Szczecin, Kielce, Kraków and Rzeszów affiliated to local Chambers of commerce and business associations will act as intermediary for FEMIRC activities. The agreement of co-operation between FEMIRC and EURO INFO in Poland will synergise effectiveness of innovation processes among SME's.

2) Technology Agency (Agencja Techniki i Technologii) - the new governmental agency targeted to innovation and technology transfer now is in developmental stage. FEMIRC will offer information and consultancy services covering Agency statutory tasks.

3) The State Committee for Scientific Research as governmental body responsible for R&D in Poland will be a very important user of value added information services according science and technology policy. FEMIRC is integrated into the technology policy of the Polish government supervised by the State Committee for Scientific Research. This authorities support the FEMIRC and expect it to play an important role in the development of Polish economy.

4) Nationwide and regional technological and commercial institutions and organizations as Polish Business and Innovation Centres Association (Stowarzyszenie Organizatorów Ośrodków Innowacji i Przedsiębiorczości w Polsce)

5) Nationwide and regional information institutions and organizations taking part in „Information Society” Programme.

6) Appropriate EU and CEEC institutions, organizations and programmes.

All mentioned above and many other organizations are producers and users of various leaflets, bulletins, www home pages, textual and structured databases and information services concerning research and innovation activities, so they are designers, multipliers and users of grey literature services on research reports, technology tenders, patents, certificates, trade and marketing brochures and leaflets.

OPI will extend FEMIRC activities due to other actions of Implementation of Information Society. It will be an organiser of nationwide seminar on FEMIRC activities and participation in EU R&D programmes. OPI creates and conducts FEMIRC bulletin in printed and electronic form, disseminates information on CORDIS databases, conducts databases on R&D institutions and on R&D projects and completed reports. It is supported by the Institute of Fundamental Technological Research in providing information via Internet, conducting information services on WWW server and other information and training activities.

OPI as the co-ordination unit is furthermore responsible for the management concerning the FEMIRC network co-operation, collecting financial and technical reports from the FEMIRC partners and preparing technical (deliverables) and financial reports to the Commission, representing the FEMIRC in contacts with the Commission, the twin IRC, FEMIRC network, the Polish Government, local authorities and public agencies, dissemination of information and special demands from the Commission to the FEMIRC partners, monitoring IRC activities in regional units, according to workplans and timetables accepted by EC, reacting for delays and troubles, creating FEMIRC image

through publishing common FEMIRC bulletin and newsletter (in printed and electronic form), and articles in external publications and other media in Poland and abroad, organising and conducting meetings with the FEMIRC consortium partners. It integrates regional units for complementary and synergetic activities within existing national structures and circumstances, providing organisational help for country-wide events.

Participation in EU RTD programmes is an advantage for comparisons between Polish and other CEEC countries grey literature related activities with European Union countries achievements. The most obvious is comparison between SYNABA and the Polish Research Directory publications and databases from one side and between CORDIS services from the other side. Generally, information content is similar, but structure and software is different.

The Fifth Framework Programme is an advantage to increase impact of information centres in Central and East Europe Countries (CEEC) in international - European and global co-operation, in building together Global Information Society. Information Processing Centre in Poland is going to take part in this challenge.

Russian Grey Literature Collection and Dissemination Centre: Status, Profile of Activities, Development

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Abstract

30 years ago within the STI infrastructure of the USSR a special centre was created by the government decision with the aim of covering all the Soviet grey literature documents in a centralized way. The Centre, now named the Scientific and Technical Information Centre of Russia (the Russian acronym - VNTIC) is responsible for the maintenance of the complete repository for scientific research and development reports and dissertations (candidate and doctoral). VNTIC carries out the dual function of both archiving and disseminating grey literature. For the years of VNTIC existence there are about 7 million documents totally accumulated in the fund reflecting the state-of-the-art and all the main results of R&D activities undertaken in the USSR and now in Russia and covering all the branches of science and technology i.e. all the subject headings of knowledge classification. A general outline of VNTIC activities is given, a brief description of the documents processing technology is presented and some views of the future development are stated.

1. Introduction

In the late '70s - early '80s there was established a well developed infrastructure for the sphere of scientific and technical information (STI) in the Soviet Union. The framework of this infrastructure was based on the so called State System for STI (abbreviated in Russian as GSNTI). Even then when the global role of information as the most important strategic resource was not so evident like now, on the verge of the XXI century, the development of STI agencies and services was considered among the first state-level priorities.

The State System for STI integrated an advanced three-level hierarchy of information centres including the all-Union level institutions, branch-specific and regional centres on the second-level and the third-level STI departments of different organizations and enterprises. The scope of branch-specific and regional centres activities is evident from their names, e.g. Informelectro, Informenergo and other centres belonging to the corresponding ministries and state committees; Volgograd STI Centre, Khabarovsk STI Centre and other, totally 69 centres covering the corresponding geographical regions.

The area of the all-Union status centres activities was determined by the types of STI documents supposed to be processed at the centre, e.g. The All-Union (now - All-Russian) Institute for Scientific and Technical Information (VINITI) - published STI documents (papers from scientific journals, monographs etc.); Scientific and Industrial Association

Acronym
List

"Poisk" - patents and patent applications; The State Public Scientific and Technical Library (GPNTB) - books, periodical and serial publications, etc.

Russia of the '90s has inherited from the former Soviet Union all the three levels of STI institutions: first level - nation-wide (formerly of all-union, now - of all-Russian status) information centres - original database generators each covering different kinds of documents (articles, patents, books, reports etc.); second level - branch-specific and regional information centres; third level - information brokers and departments of different organizations and companies.

30 years ago within the STI infrastructure of the USSR a special centre of the first level was created by the government decision with the aim of covering all the Soviet grey literature documents in a centralized way. The Centre, now named the Scientific and Technical Information Centre of Russia (the Russian acronym - VNTIC) is one of the world's largest information bodies and maintains a vast collection of Russian grey literature that reflects the state-of-the-art in Russian science and technology most completely and covers key data unavailable outside the former Soviet Union (FSU). The nearest Western analogue to VNTIC is the National Technical Information Service (NTIS) of the USA.

In the contribution a general outline of VNTIC activities is given, a brief description of the documents processing technology is presented and some views of the future development are stated.

2. VNTIC Status and Activities Profile

VNTIC is a nation-wide (i.e. federal) information agency responsible for the maintenance of the complete all-Russia (before 1991 - all-Union) fund for scientific R&D reports (projects) and dissertations (candidate and doctoral). The presentation of the documents to the VNTIC fund is obligatory for all the organizations engaged in state-budgeted scientific research and development and is carried out in accordance with the Federal Law of the Russian Federation "On the Obligatory Copy of Documents" adopted by Russian Parliament and published on January 17, 1995. The fund is supported in two forms: human-readable full-text primary documents (reports and dissertations), stored on microfiches; machine-readable (secondary) documents, containing bibliographic descriptions and abstracts of the primary documents and stored in a database structure to provide information search and retrieval.

The revised version of VNTIC Statute registered in 1992 claims that VNTIC is a unitary state enterprise with the right to carry out commercial activities. It means that VNTIC can only partly enjoy the privilege of state budgeting and is supposed to cover the rest part if its expenditure with the income received from commercial activities. This version of Statute most corresponds to the uncertain economic situation in Russia when the mechanisms of state budgeting fail to work with typical delayed or underpayments and the right to independent business operations including international ones is very important. For VNTIC commercial or business operations mean, first of all, selling different kinds of information products and services and leasing some VNTIC building and site area.

In its main sphere of activities directed to support the national repository for grey literature VNTIC is supervised and should be financed by the Ministry of Science and Technology of Russia. Clause 10.2 of the Law "On the Obligatory Copy of Documents" reads:

"The producers of documents should deliver to the Scientific and Technical Information Center of Russia (VNTIC) of Ministry of Science and Technology of the Russian Federation within 30 days an obligatory free copy of:

VNTIC pioneered many technological and equipment innovations in domestic information industry: high-production microfilming equipment was started to run at VNTIC in the late '60s; computer database of large scale on magnetic discs was created for VNTIC user access in 1971; wide-area computer network with the central node and host-computer in VNTIC was put into operation in early '80s covering all the territory of the Soviet Union and providing users with online teleaccess to VNTIC databases.

The block-diagram of VNTIC documents processing technology is shown in fig. 1. There are two general groups of processes in the industrial information technology. The first group of full-text documents fund and database support includes the following processes:

- document state registration and inventory;
- microfilming;
- fund (repository) support;
- content analysis;
- computer inputting;
- database support.

The second group of processes for providing user services includes:

- publishing and circulation printing of VNTIC editions;
- copying of full-text documents by orders (document delivery);
- database search and retrieval (requests processing);
- reading room services.

3.1. Registration and inventory

With this set of input operations the arriving document flow processing begins. For each newly-started R&D work (project) initiated in Russia and state-budgeted there is the so-called registration card with the main data on the project filled in by the executive organization and supplied to VNTIC. Each card (project) is assigned a unique standard state registration number and the registered card is inputted into the database.

The full-text R&D report (project) and dissertation manuscripts (primary documents) arrive in VNTIC along with their accompanying information cards - secondary documents containing bibliographic descriptions and abstracts of the primary documents. Both primary and secondary documents are assigned unique inventory numbers by which the correspondence is established between the primary and secondary documents of the same name in the repository and in the abstracted database.

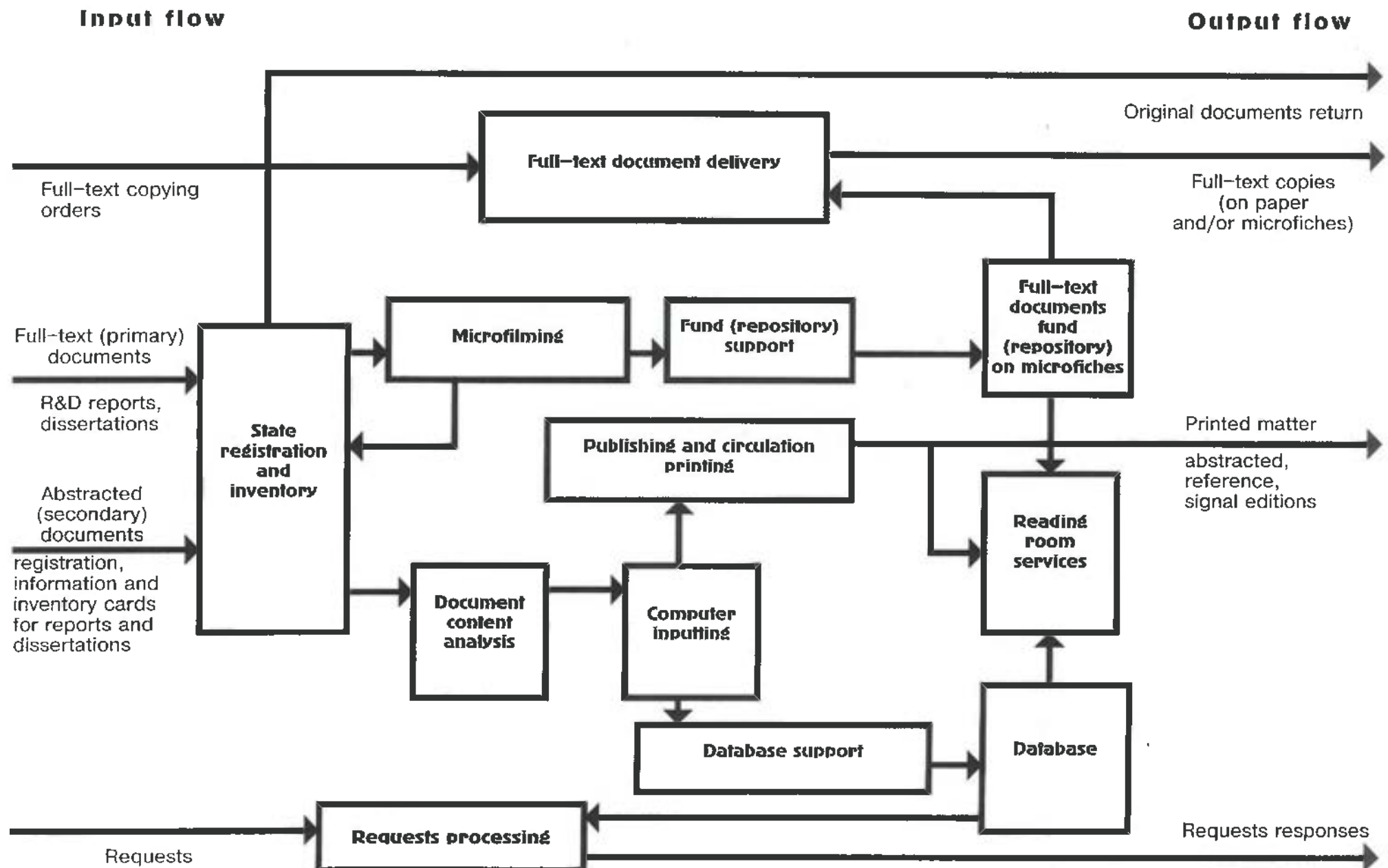
The stage of registration and inventory also includes the operations of organizations - the document suppliers database support, assigning the standard code numbers to the organizations-suppliers and input control of the documents for the completeness and print quality.

3.2. Microfilming

It is suggested that at least for the several nearest years the microfiche should be retained as primary document archiving medium. For the time being there are some obstacles to move completely to electronic image processing and storage for the purposes of archiving. The obstacles are of legal, technical and economic origin. There is still no adequate legislation supporting validity of electronic signatures and stamps. The standard optical microfilming resolution (80 lines/mm) is unattainable in electronic scanning within the reasonable economic limits.

The full-text primary documents are microfilmed using high performance optical cameras, high-speed developing machine and halogen-silver film. The film ensures the long-term storage that is necessary for the archiving purposes. Each document corresponds to a separate 98-frame microfiche or a set of microfiches in case of a longer document. The daily portions of microfiches are handed over to the repository that is the basis of VNTIC archiving fund.

Fig. 1. VNTIC DOCUMENTS PROCESSING TECHNOLOGY



3.3. Fund support

The VNTIC fund repository uses mechanized rack cabinets to store numerically ordered microfiches. Each cabinet contains 80 thousand fiches. A set of microfiches corresponding to one primary document is stored in a separate envelope on which the inventory number is shown.

At present there are 1,1 million units of primary documents in VNTIC repository including:

- nearly 700 thousand R&D reports (1984-1997);
- more than 350 thousand candidate and doctoral dissertations (1980-1997);
- 13 thousand descriptions for computer algorithms and programs (1980-1997);
- 76 thousand translations (into Russian) of foreign scientific and technical literature and documentation (1989-1997).

Also there are about 2 million units of secondary documents paper originals (1985-1997) in the repository including:

- more than 700 thousand registration cards;
- nearly 900 thousand information cards for reports;
- more than 300 thousand inventory cards for dissertations;
- 9,5 thousand information cards for computer algorithms and programs.

There are four sections in the subject structure of the VNTIC fund: social sciences, natural and exact sciences, technical and applied sciences, interdisciplinary problems and other sciences. The contents of the sections are described in the State Subject Headings Classifier for STI that is an official publication.

3.4. Content analysis

All the secondary documents of the VNTIC input flow, that is registration, inventory and information cards are subjected to several operations of intellectual processing by human specialists. As a result of content analysis each card (or, to be more exact, each document it represents) is assigned a corresponding subject heading (or several subject headings in case of multidisciplinary work) in accordance with the mentioned State Subject Headings Classifier for STI. There are three levels of subject classes used in Russia, the first being the most general and the third - the most detailed level of science and knowledge classification.

The second content analysis procedure aims at indexing the documents that is assigning each document (mainly on the basis of its abstract) a list of key-words, typically, not more than 7-10 key-words, reflecting the abstracts content. Most often key-words are scientific or technical terms which appear or may not appear in the text of the abstract. Though the database management system used in VNTIC does the automated indexing including all the words from the abstract (minus stop-words) in the list of key-words it is believed that human indexing helps to improve the searching qualities of the document.

3.5. Computer inputting

After being subjected to registration, inventory, coding, subject classification, indexing and editing the secondary documents are inputted into computer. The content of the cards is keyed-in by human operators using personal computers. In the course of inputting some formal software control is carried out. Also, human proof-reading helps to minimize the mistakes after inputting the proofs. The inputted documents in machine-readable form are used to support the so called current document arrivals file. The file is used as a regular source of the database input and in the preparation of the VNTIC traditional publications.

The keying-in is still preferred to electronic scanning on the industrial scale because of the low print and paper quality of the arriving documents.

3.6. Database support

The database of VNTIC is a combination of the following technologically coordinated databases (DB):

- information cards for R&D reports DB: 1 million documents since 1985, 30 data fields, size 1 Gbyte;
- inventory cards for dissertations DB: more than 300 thousand documents since 1985, 30 data fields, size 700 Mbyte;
- registration cards DB: more than 60 thousand documents since 1992, 30 data fields, size 70 Mbyte;
- technological DB for organizations: data on more than 30 thousand organizations - the document suppliers and request-sources to VNTIC, 21 data fields, size 6 Mbyte;
- address-reference DB for organizations of scientific R&D sphere of Russia: more than 3 thousand organizations, 9 data fields, size 3,5 Mbyte;
- DB "State Subject Headings Classifier for STI": 8 thousand codes and names of 1st, 2nd and 3d level headings (in Russian and in English), 1996 version, 2 data fields, size 1,3 Mbyte;
- DB "Doctorate Holders in Russia": personalia on more than 14 thousand scientists since 1992, 10 data fields, size 10 Mbyte;
- English language DB (a fragment of the first two DBs): 4,5 thousand records of 1997, 20 data fields, size 6 Mbyte;
- publishing DB: nearly 28 thousand records for 1997, 20 data fields, size 42 Mbyte;
- problem-oriented DB: nearly 25 thousand records, 55 data fields, size 42 Mbyte.

The database management system "Irbis" developed in Russia is used to support the information, inventory and registration cards DB, DB for organizations and Subject Headings Classifier. "Irbis" works in operating environment Windows NT and MS/DOS.

Most databases are updated at the rate of the document arrival, some -bimonthly. All the databases (except the technological one) are used for user services at requests and are commercial products for sale inside and outside Russia. Internet users can get access to the databases via e-mail in the delayed requests mode when requests are sent via e-mail, the search is being done by VNTIC staff members and the search results are sent back to the users.

3.7. Publishing and printing

In preparation of VNTIC publications a desk-top publishing technology is used. The editing and proof-reading operations including spelling and style corrections are performed by human professionals.

A short description of VNTIC publications was given in section 2. Each of the 28 subject series of the Registration Bulletin and the Collection of Abstracts (Abstracts Journal) has its subject profile determined by the list of the subject headings codes. In the process of the Bulletin and the Collection preparation all the documents belonging to a particular series in accordance with the subject headings list are selected from the current document arrivals file. Each publication has a subject index with the alphabetically ordered key-words from the documents.

The necessary number of copies is printed using high-performance copying machines and is sent to the subscribers. Ten of the 28 series of the Abstracts Journal are translated and published in the English language.

The VNTIC reference editions are published on the basis of the databases for organizations and "Doctorate Holders in Russia".

3.8. Document delivery

Copying full-text (primary) documents is performed to users' orders which are placed by ordinary post, telephone calls, telefax messages, electronic mail or at personal applications. Users are supposed to show inventory numbers of the documents to be copied and the type of the carrier (paper, microfiche, electronic representation) in the order form.

The coming orders are sorted by the types of documents and inventory numbers. The requisite master-fiches are taken out from the repository and passed to the copying shop. The microfiches are scanned and then printed out on paper by a laser printer or written on diskettes in image format or, at request, after character recognition procedures. Master-fiches are copied on less expensive diazo-fiches.

The copied documents are delivered by post, electronic mail (in case of selective copying) or handed out personally.

3.9. Search and retrieval

As in the previous case the requests for database search and retrieval are directed to VNTIC by ordinary post, telephone, fax, electronic mail or applied personally. As a rule the requests are presented in natural language and may include the following kinds of queries:

- retrospective subject search by subject headings codes or by key-words (the so called subject queries);
- search by separate document's requisites or their combination, e.g. year, source organization, author etc. (factological queries);
- combined subject and requisites search (mixed subject - factological queries).

The searches are carried out using retrospective abstracted databases on scientific reports information cards and inventory cards of dissertations. The database management system "Irbis" used in VNTIC supports efficient search procedures by means of flexible user interface and inverted files for key-words, subject headings and other search requisites. Users can conduct online search themselves or with the aid of qualified specialists from VNTIC.

Printed out search results - the sets of found relevant documents are handed out to the users or sent to them over ordinary or electronic mail.

3.10. Reading room services

There is a reading room in VNTIC open to public. The visitors of the reading room can get there any document they need from the VNTIC fund on microfiches. The room is equipped with microfiche reading devices. Also all the VNTIC publications are available to readers in the room.

The retrospective databases serve as electronic catalogue to the VNTIC fund. On conducting the search the visitor can obtain the inventory numbers of relevant full-text documents. The visitor can order selected or full-text copies of the documents.

There are about 4 thousand readers serviced in the reading room every year.

4. Future Development

No matter how hard the current situation in Russian science and STI sphere is VNTIC not only continues to maintain the federal fund on Russian grey literature but also considers some definite ways of future development. There are at least two aspects of planning the future that should be mentioned here. The first one concerns the profile of VNTIC activities and the second one is of technical nature.

As it has been stated the main function of VNTIC is to collect traditional forms of unpublished documents. The idea of extending the spectre of unpublished documents to be collected by VNTIC originates from two considerations. First, there is a qualified staff of

information specialists, a well-developed document processing technology, some office space still vacant in the VNTIC building, that is there are some very important resources that have not yet been properly realized. Second, the traditional grey literature documents of VNTIC profile - reports and dissertations - cover rather a narrow category of professional authors and demand large sums of money to be prepared. There is still a great part of intellectually creative community whose ideas are lost to society since never become public or published. The loss is very considerable since the great educational and creative potential of intellectually active people in Russia is well known.

That is why it is suggested to set up a national bank of ideas on the basis of VNTIC with the main task to collect a public fund of untraditional intellectual products such as different projects, technologies, conceptions, processes, methods, devices, structures, educational and training materials, etc. which on this or that reason didn't find their way to public. To introduce them to national fund in the form of applications for intellectual product registration would mean to give the products some official and juridical status that could be an argument in priority claims. Some parallel can be made here to well-known Japanese practice of registering and publishing the unexamined applications for patents.

As far as the technical development is concerned there are several important reasons behind the VNTIC technological re-equipment project initiative.

The existing and operating VNTIC microfilming and photocopying equipment is obsolete and worn-out. It needs urgent renovation. The present computer and software configuration needs not only modernization but a complete re-engineering because it was set up as an ad hoc solution in the process of forced and urgent downsizing with severe financial shortages when VNTIC mainframe computers were shut down on economic reasons. The configuration is now based on PC computers (mainly 386 and 486 with two Pentiums); its throughput and reliability don't correspond to the requirements of the large-scale professional information centre of federal importance like VNTIC. The problem is therefore to move from just downsizing to rightsizing.

It is also supposed that VNTIC re-engineered and re-equipped information system will satisfy both the Federal Law and international standards. It will become possible to "pack" information from VNTIC repository so that it can be accepted by Western users.

The information processing system configuration of VNTIC is rather complicated as involving technologies of different nature including manual handling of documents, semantic processing of their content by human experts (editing, indexing etc.), microfilming, repository maintenance, computer processing, database support, periodicals publishing.

The current version of the system was designed and started to run nearly twenty years ago. There existed two different and completely separate information processing technologies at that time: microfilming of full-text primary documents by means of optical photographic cameras for the purposes of archiving and hard-copying; computer inputting and processing of abstracted (secondary) documents for database support, information search, retrieval and publishing.

Recently we have all been the witnesses of a tremendous progress in information and computer technologies. The success of electronic imaging and image processing using scanning equipment, optical memory systems facilitates the integration of full-text and abstracted documents processing and presentation in a more or less uniform electronic medium.

This trend of electronic full-text imaging for storage and search along with another most important information technology tendency to worldwide computer networking are reflected in the conception of VNTIC re-engineering and re-equipment project.

Now the project is in its conceptual, planning and hardware/software architecture design stage. The general functional and technical requirements and specifications have been prepared for the project. There are some promising perspectives of attracting both government and private structures for the necessary financial support of the project.

The implementation of high information technology would allow VNTIC to follow up the growing input flow of extended nomenclature documents.

5. Concluding Remarks

In the early '90s there were some destructive tendencies of doing away with large nation-wide information centres in Russia. Everything centralized or state-scaled was automatically attached a negative sign as having Soviet connotation. Life proved this approach to be wrong. Large information centres of federal importance still exist and should have a good promise to develop. The experience of VNTIC is a positive example in favour of this attitude.

During 30 years of its existence VNTIC:

- collected and processed more than 7 million primary and secondary documents;
- distributed nearly 20 million copies of its serial, analytical and reference publications among about 10 thousand collective subscribers;
- disseminated more than 5,3 million copies of full-text scientific reports and dissertations;
- distributed machine-readable databases containing totally about 20 million records;
- carried out nearly 500 thousand subject, factological and reference requests.

The Decision of the government of the Russian Federation № 950 of July 24, 1997 "The Regulations on the State System for STI of the Russian Federation" claims the necessity to develop the system for STI on the state level and confirms the leading role of VNTIC in the area of Russian unpublished STI documents.

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The administration of ISO10444: International Standard Report Number. Activities and cooperations of the International Registration Authority

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Abstract:

Abstract: Established end of 1994, the International Registration Authority is implementing the ISRN (International Standard Technical Report Number) system. In addition to the well-adopted and well-running numbering systems ISSN and ISBN the ISRN registration has the goal to make grey literature, especially scientific reports, better accessible by an improved identification system. FIZ Karlsruhe in Germany took over the task of the International Agency and started to build a network of national agencies, which are national libraries, central scientific libraries and national information services with grey literature holdings. The specifications in the ISO 10444 standard have to be adopted and ruled in detail by these national agencies in cooperation with the producers of report literature. The specifications also have to be adopted by database producers citing grey literature. The problems and solutions of national agencies are described and an outlook for the acceptance and implementation of the new numbering system is given.

Contents:

1. Introduction to the ISRN System
2. Activities of the International Registration Authority
3. Cooperations between the Agencies and adoption of the standard
4. Implementing problems
5. Outlook

1. Introduction to the ISRN System

Research reports/technical reports are an important type of literature in the scientific community and the prototype of grey literature. According to the well adopted international numbering systems of publications - I am only mentioning now the ISSN numbering system for journals - a system for technical reports was founded by ISO, too.

- The standard

End of 1994, the standard ISO 10444: 1994 First edition 1994-12-15 with the title "Information and Documentation - International Standard Technical Report Number (ISRN)" was published. In parallel - as a condition for the publication of the standard - an authority agency was appointed and named in the standard.

- The structure of the report code and the report number

In international databases, which announce reports and offered on-line searching and published printed indices, a structure of a report number became usual since the seventies. This structure was also the basis of the ISRN system.

Extracted from the standard the structure is demonstrated:

The first part of the number is the report code. It designates the organization issuing the technical report. Normally these report number stems represent the acronym or the abbreviation of the producer. We easily will find prominent examples:

MIT/LCS/TR PSI-RR INFN/AE

Short names of serials within huge organizations are also included in the report code. The first character of the report code shall be an upper case alphabetic character, the remaining may be alphabetic or numeric characters.

The second part after an unusual but unique separator (two hyphens) is the year of publication, then the sequential (the real number) follows. The second group separator (another double hyphen) separates the number from the ISO country code. Then a possibility of additional individual numbering is offered.

The numbering reflects existing report numbers. The standard highly recommends the use of all the mentioned parts and the international Registration Authority will urge the national centres in adopting strictly these rules.

My paper published in the report series of my institution would thus have the following ISRN

ISRN: FIZKA/GL-97/13--DE

2. Activities of the International Registration Authority

In December 1994 a Registration Authority (International ISRN Agency) was designated. FIZ Karlsruhe, the STN European Service Center, producing and providing scientific and technical information services in printed and electronic form, took over the task. FIZ Karlsruhe has longterm experience in handling grey literature, and is active in standardization and international cooperations for producing databases and offering together information services.

The tasks of the International Registration Authority include:

- to implement, coordinate and administer the ISRN system in accordance with ISO 10444
- to appoint the national (or regional) ISRN agencies
- to collect data on assigned report codes and to maintain this report code data in the form of an international register

The most important task at this time is to appoint national or regional agencies and to build a network for the registration.

The tasks of the National or Regional ISRN Agencies include:

- they form the links between organizations issuing technical reports in their country or region and the International ISRN Agency
- they are responsible for registering existing and new report codes
- they have to maintain a national register of the report codes assigned.

Different types of organizations can act as National Agencies. In order to have synergetic effects between their prime tasks and their registration activities, organizations involved in

collecting and indexing grey literature in their country could act in the most effective (and cost-effective) way as National Agencies.

3. Cooperations between the Agencies and adoption of the standard

For Germany, France and Italy National Centers have been designated by national standardization authorities. Several national libraries and database producers showed interest in becoming a national agency. Guidelines and rules have been sent to these centers. A software, with which the national registers could be administered and data be exchanged with the international agency is in preparation. Some publishers of technical reports already print the ISRN - structure on their reports. Database producers do not use the ISRN standard for the report-number fields yet. The ISRN could be a basis for Unique Record Locators, Numbers for Digital Object Identifiers etc.

With the following institutions we succeeded in the first step of building a network

Country	Institutions	Level of working
Algeria	Centre de Recherche sur l'Information Scientifique et Technique, Hydra Alger	received guidelines
Australia	National Library of Australia, Canberra	received guidelines, and will become the ISRN agency
Finland	Helsinki University Library	received guidelines, analyse possibility to participate
France	INIST, Institut de l'Information Scientifique et Technique, Nancy	are named by AFNOR, will start work when software is available
Germany	Technische Informationsbibliothek, Hannover	are named, will start work when software is available
Italy	CNR, Biblioteca Centrale	Informed us, that they are designated by the national standardization organization and received guidelines

Namibia	National Library of Namibia, Windhoek	received guidelines
Russia	Scientific and Technical Information Centre of Russia (VNTIC)	received guidelines
Spain	Centro de Informacion y Documentacion Cientifica, Madrid	received guidelines
United Kingdom	BLDSC, Boston Spa	will use their own databases, which have to be integrated in the international register
United States	NTIS, Springfield	the national maintenance agency for the US STRN received the guidelines, up to now no answer

4. Implementing problems

The adoption of the ISRN is not at all at a stage where we wished it to be 3 years after my organization taking over the task. We only have 3 designated national centers, but they have not started work yet for variant reasons. The International ISRN Agency established detailed guidelines, but some national candidate centers need a more practical solution for their work (i.e. adopting existing databases). Other national centers feel the rules are too flexibel and see the danger of a register not being on a high level of standardization. A software, with which the national registers could be administered and sent to the international agency is in preparation, but financial restriction delayed the release, too.

The literature type "Report" is not embedded in the publishing business. There is no economic need or economic interest for organizations to become a National Agency. The registration work is costly and time consuming, especially the contacts with producers of reports is time consuming. Therefore only a self-interest in grey literature will push the work for the registration procedure. The organization will then realize that contacts to producers might improve their coverage of grey literature and will also an effect a recognition of their organizations in the scientific community.

Concerning the other numbering systems, the ISBN and ISSN are now used for the PII and DOI-Systems for the identification and follow-up of the use of the electronic versions. Reports are mostly for free, and it is the aim for a report to be widely spread within the scientific community. But the problem of identifying them will always exist. So we continue making every effort to implement the system.

This is to encourage you and invite you as participants of this conference with an interest in grey literature to support the establishment of national centers in your country in order that a comprehensive international register will soon become reality.

5. Outlook

When FIZ Karlsruhe published worldwide a press release announcing its new function and promoting the ISRN system, a lot of interest was shown. Marketing people, press staff, people responsible for the corporate design of industry and research centres showed interest in having the report number which represent their organization in registers and published indices in an orderly way.

The International ISRN Agency therefore

- will contact more organizations and convince them to participate in the network of national ISRN centres
- will offer a software product for the national centres
- will update and complete the guidelines and rules
- will prepare database producers for the insertion of ISRN structure
- will promote the use of the ISRN structure for use in the electronic environment for URLs etc.

Our address is:

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UK THESES ONLINE ?

University theses contain the most up-to-date research in most subject areas and yet they are some of the most difficult sources of information to identify, locate and obtain. Whereas research that is published in conventional books by conventional publishers is made known through publishers' catalogues and mail-shots, there is no marketing incentive to make people aware of the research that is available in university theses. Even when a good indexing tool to theses exists in a particular country, such as the Aslib Index to Theses in the UK, there is a time-lag between the completion of the thesis and its appearance in the indexing publication. If universities were commercial organisations they would want a potential market to know quickly about their achievements, but so often within universities the completion of the thesis is seen as sufficient in itself, without any need to make the results of the research available to anybody else. It is true that the best research is often published soon after the completion of the thesis in commercial publications like academic journals, but what happens to the thousands of theses that are completed and are not published? The answer is that they languish on library shelves, taking up valuable space and are rarely-consulted. Maybe some theses do not deserve to be consulted again, but if a university has considered the thesis to be of sufficient quality to be worth the award of a higher degree to the author, surely it is worth making more of an effort than is made at present, at least in the UK, to make the results of the research available to a wider community. In fact, by burying such

research in volumes on library shelves, universities may be missing out on opportunities to publicise the quality of research undertaken in their academic departments. The ease of electronic submission and availability brings problems but it also brings substantial benefits.

The aim of the University Theses Online Group in the UK is to make information about doctoral theses available quickly and easily and to provide fast access to the full-text of theses when that full-text is required. The key to the achievement of this objective lies in the submission of theses in electronic format. The electronic format will enable the faster recording of the title and abstract of theses in indexing tools and the easier transmission of the full-text of theses to anybody who requires the full-text. It will also enable more sophisticated subject indexing to the content of theses than is presently available for UK theses. Submitting the text of theses electronically will also save universities and individual research students money by avoiding the need to create and store paper volumes. The University Theses Online Group consists of representatives from twelve UK universities and was formed in the wake of the Follett Report on university libraries, which encouraged libraries to look at new forms of information provision. The Group was formed initially by librarians, but now has representatives from the university computing and administration communities. The electronic submission and availability of theses is an issue which touches many aspects of university life and if it is to come about has to receive the support of the university as a whole.

The Group realised from the beginning that there would be no chance of realising the Group's objectives without the support of the academic leadership in each university. The doctoral thesis is at the heart of academic value, a kind of touchstone of academic prestige, and it was realised that any proposal to change the submission process would be received with great caution by the academic community, and rightly so. What the Group is trying to do is to convince university authorities that there is much to be gained from a change to electronic submission which is organised professionally and which need be no threat to academic values. There is some concern, for example, about a greater risk of plagiarism through the easy availability of the electronic format. Whether those concerns are justified or not, the University Theses Online Group is taking them seriously and in any proposal to our respective universities we shall face up to those concerns and propose measures which we believe will answer the concerns. What we are proposing is a culture change for UK universities in accepting electronic rather than paper submission and this change will take several years to achieve. The question-mark in the title of this paper is an indication to you that we still have a long way to go before we achieve our objective.

In order to achieve the objective of electronic submission and availability of doctoral theses in the UK we have been following a strategy which has a number of phases. It is a strategy which has evolved as we have come to realise more clearly the complexity of the task we have set ourselves. For example, when the Group was first formed in 1994, our thought was that we would create the electronic format by scanning the paper text of theses after the examination process had been completed. We soon

realised that this would not be as easy as it sounds and would also be quite an expensive process on a large-scale. Our current strategy is therefore to gather information on the use of theses, to persuade universities of the advantages of electronic submission of doctoral theses, to undertake pilot projects, and to work with potential partners in the information world.

The first action we decided upon was a survey of authors and supervisors of theses in eight universities, around 4000 individuals in all. Funding for this survey was provided by the Joint Information Services Committee of the UK Higher Education Funding Councils and by the British Library Research and Innovation Centre. The survey was conducted by a team from the University of Edinburgh in the autumn of 1996 and a report on the survey can be found on the UTOG Web page (URL <http://www.cranfield.ac.uk/library/utog/>) or in an article written by Joanne Lomax in the journal *Program*, volume 31 number 4.. The survey was very helpful to the Group in providing information about the way in which theses are identified, obtained and used. Most of the respondents replied positively to questions about electronic submission and availability, so the Group felt encouraged to seek further funding from the British Library Research and Innovation Centre to hold a seminar aimed at influential members of the UK higher education community. Over 100 people attended the seminar in June 1997 and again much was learned about attitudes towards the electronic format for theses. There are different attitudes, for example, across the subject disciplines, scientists tending to regard the thesis as merely one stage in the development of a research topic, whereas a humanities thesis tends to be a complete work in itself. The seminar has helped to raise the

profile of the Group and prepared the ground for pilot projects in several universities. The intention is that over the next six to nine months a number of research students in various universities will be contacted and invited to submit their doctoral theses electronically as well as on paper. This will give members of the Group experience in the problems of electronic submission while not disturbing the current examination process. Much will depend of course on the cooperation of individual students and supervisors but we hope that there are sufficient people who see the potential benefits of electronic submission for us to have a meaningful trial.

One key factor we have to explore is the technical format in which the text of theses would be submitted. The Group does not have any pre-conceived ideas about the best format for this purpose, but whichever format is adopted must be readily-available to research students and compatible with international standards. The greatest experience of electronic submission of theses of which we are aware is that being gained by the Networked Digital Library of Theses and Dissertations Project led by Ed Fox of Virginia Tech. (URL <http://www.theses.org>). This Project is encouraging submission in both PDF and SGML formats and we shall have to see whether this is feasible in a UK context. There may be great advantage to be gained by UK universities adopting the procedures already set up by the US group and we are exploring how and to what extent we can cooperate. We are also looking at other potential partnerships at various stages in the information chain. The indexing and abstracting of theses in electronic format will be critical if the content of theses is to be used effectively, and we are hoping to have discussions with the publishers of the ASLIB Index to Theses, who already have an

electronic version of their publication available, to see whether their publication is the right vehicle for the dissemination of indexing and abstracting information for online versions of theses. A further partnership could be with the British Library Document Supply Centre on the electronic delivery of the electronic full-text. BLDSC already offer a conventional delivery service for many UK theses and have been represented on UTOG since its foundation, so collaboration with BLDSC on electronic delivery would make a lot of sense. What we must do, in exploring these various partnerships, is ensure that our universities support us and that they are satisfied that any arrangements entered into, particularly commercial arrangements, are in the interests of universities. If there is any profit to be gained from the electronic dissemination of theses, the universities must share in that profit.

Let me close by coming back to the question-mark in the title of this presentation. The advantages to universities, to research students and to users of doctoral theses from the electronic format are so strong that the members of UTOG have no doubt that within a few years UK theses will be available electronically. The uncertain factors are how long it will take for electronic submission to become the norm and what form electronic availability will take. There are times when the members of UTOG feel that we are lone voices in the wilderness of lack of interest within universities, but then we are encouraged by the success of actions we have taken, like the survey or the seminar. The University Theses Online Group has no official standing and has no funds other than we are able to seek for specific events, but as we are the only UK group active in this area we have to continue with our strategy and trust that in due course UK theses will be available online.

Information Technology, The Web, and Its Impending Shakedown: Why and How Projects like Columbia International Affairs are Essential

LINCOLN S. ELLIS

CIAO, Columbia International Affairs Online

In 1993, when the World Wide Web made its public debut, the world of information technology and exchange was filled with new possibilities. Of course, the world has long been full of possibilities, which turned on the development of new technologies, the steam engine, the telegraph, the telephone, automation of all sorts, and the list goes on. But somehow this revolution was meant to be something different, something special, something so stacked with potential people could not shy away.

Four years later, that promise lays in chaos. Those once excited are now pessimistic, those singing the web's praises are now composing funeral marches and writing epitaphs. What has happened? What went wrong? And, is there still a chance to back alter course in time to realize the potential still lurking in series' of zeros and ones?

We need not remain so pessimistic. The promise is still there. The potential is still underutilized. And, the next wave is on its way. At this very moment one of the first shakedowns of the World Wide Web is well underway. The massive amount of information promised is beginning to be delivered, at low costs and to an exponentially greater amount of people. These structural and normative changes in the way people develop for and use the Web are indicators that indeed we may well be on our way toward realizing the aforementioned potential.

Nevertheless we must be vigilant about falling prey to the same pitfalls as our predecessors. We, as developers, must make clear our goals as well as our needs as we attempt in assundry fashion to aid those, whose work is invaluable. Particularly to those amongst whose goal it is to negotiate the turbulent waters of international affairs -- in whatever shape that might take - the Web is poised to serve as the conduit through which, wars are avoided, conflicts are resolved, development is facilitated and democracy is promoted. We are charged with a responsibility of immense proportion. Failure is not an option.

Information Technology

In April of this year (1997) The United States Institute for Peace hosted a conference entitled *Virtual Diplomacy: The Global Communications Revolution and International Conflict Management*. The meeting was two days of discussions on how existing and emerging information technologies could facilitate better more efficient modes of diplomacy, relief aid, Non Governmental Organization (NGO) activity. The usual themes were covered: information sharing, various forms of networking, infrastructure, information reliability and so on. There was little doubt in anyone's mind that the explosion and exponential growth on information technology was indeed a boon for all areas of international affairs.

Yet the question remained: How useful is all this stuff anyway? Ted Okada, Director of the Washington Office for Food for the Hungry delivered a stunning presentation on Rwanda and how their NGO was able to save over 150,000 lives in just over two months but his conclusions were perplexing. Ted pleaded not for the wiring of central posts in Central Africa but for bull horns, fax machines, and telephone lines. A fancy Java script or CGI bin would do him no good, he needed the basics.

Java scripts, flaming icons (see IBM's latest "Hadley" advertisements), and multiply scripted screens share a certain sensibility to certain community but tend to overlook a good deal of the needs of people whose main focus is the sharing and dissemination of information. In short, blinking banners don't aid the peace process but bulletins on West Bank development projects do.

Another point about information technology that one should keep in mind is that the spectrum of people who have ready access to these grand developments is minuscule when it comes down to the people who matter. One needs to constantly keep in mind 'who needs what' and how they can get a hold of it. In the US the number of people who have personal computers at home has leveled off to around 35% and shows no signs of growing. This is not so surprising as well over 65% of all work places in the US are wired and people have access to computers and the Web via these outlets.

What these numbers should alert developers and deliverers of information to is who has access to what, when, and how. We now face a bit of a conundrum: a once radically democratic space for the free flow of information has turned out to be a rather elitist modicum of information delivery and sharing. Yet, I argue, we should not let this deter our efforts.

The fact is that the costs of wiring developing countries in most cases is relatively small when compared to efforts to build other types of infrastructures such as roads and bridges or housing. To be sure, in some cases roads, bridges, and homes may be more pressing concerns than computers and information but we should refuse to see them as mutually exclusive. In fact we should see them as mutually enabling.

What we now face is the dawn of an amazing possibility, the possibility to deliver at very low costs -- to both providers and user -- extremely valuable information and a forum for interactivity like nothing ever before witnessed in human history. With the aid of a modem and a few keystrokes diplomats, NGO workers, researchers, and policy makers have at their fingertips an almost daunting amount of information.

The Web

Ideally the Web was meant to be radically democratic playground for ideas and the free exchange of information in one of the world's most user-friendly designs. As we move into the next century the information based economy will take full shape. Fortunately for us we stand at a place, early enough in the game, to have a hand in shaping what that future looks like. The Web in particular comes ready with the following features that change the information game in a monumental manner.

Easily understood and useable delivery platform

More and more people are flocking to the internet every day. And, the form of the flood is object oriented. Pioneered, on a large scale by Steve Jobs and Apple Computers with the introduction of the Macintosh operating systems, object oriented programming is far and away the simplest and easiest format for human and computer interaction. The introduction of object oriented codes for the internet led to the Web as well as to the internet's large scale popular explosion in the early 1990's.

- **Fastest movement of a commodity in the history of humanity: Real time exchanges**

The speed through which individuals can navigate new forms of technology (the Web in particular) are astounding. Garnering information about ASEAN security talks in Sidney are no further away than the uploading of a real audio file to the Foreign ministries home page or dumping a set of document into the document collection for the conference. No longer need people rely on phone calls or faxes or -- god forbid -- wait for the next edition of the newspaper in order to get the latest, and in a number of instances crucial, information.

- **Further reaching than any other mode of transmission: Globalization**

Although the a fore mentioned conundrum of access is a reality to be dealt with, the global structure of the web, coupled with its ever decreasing barrier to entry puts us on a path toward a day -- not so far away¹ -- when more people will have access to this commodity than any other on the planet.

- **Versatility**

The ways in which the web has been and has the potential to be used are vast. From static web pages to information databases, the Web will be, if it isn't already the mode of exchange and relation in the next millennium. New developments in this medium prove on a weekly basis that indeed the future is here, now.

- **Easily updated**

Along with its overall versatility the specific functionality of Web programming and structure allow, for the first time, an efficient medium through which change is reduced as a risk in ones time or investment. Where as changes in Africa can make a printed book obsolete overnight, the same book online can be updated by the author by the end of the week and reposted making the original text once again relevant but also gaining in value as new forms of histories are constructed almost in real time.

- **Almost unlimited growth potential**

Traditional problems of space constraints virtually -- pun intended -- disappear on the Web. Through this development the rather arbitrary limitations on what gets to whom and how also seem to fade into the sun set. With these limitations obliterated new mechanisms for discerning what information is useful and valuable are being created. Sometimes they are not so new -- see peer review -- and sometimes they are.²

¹ Even the Republicans in the United States realized the need for global access. In the fall of 1995, then House leader, Newt Gingrich launched an initiative to give laptop computers with internet access to all American school children. This effort has since been picked up by the Clinton administration in one of their second term mantras, "all schools wired by the year 2000."

² In development now are a number of new search engines that not only disaggregate the relevance of your search in relation to your criteria but also categorize the nature of the site itself -- homespun, corporate, educational etc. Further levels of discrimination are also in the works and look to be at least one promising path on the road to a more coherent and useful web environment.

These six elements (by no means exhaustive) highlight the ways in which the Web presents itself as the medium through which information will be delivered shared and prepared in the next millennium. Yet questions remain and confusion reigns supreme. We are in the midst of the "information glut." How do users know what information is good, useful, and reliable? Time is the major element of people's day that they do not have more of. Research is one of the most consuming of all time oriented activities and the Web at the moment does not have friendly bone in its body toward this end.

There are however signs of life. The shakedown has begun. The impending centralization, for good, is on its way -- if it hasn't already arrived. In the next section I look how this shakedown is shaping up. I then explain the what and how of Columbia International Affairs Online and how I see its playing a role in the consolidation and segregation of the information economy of the Web.

The Shakedown

The shakedown has begun. This move is not to be confused with the also growing tendency toward high end use which might in some circles be thought of or seen as elitist activity. Information centralization in the vast and disparate land of the Web is a necessary good for which we must remain adamant. There are many a reason for this but the simple reason is time.

All the information in the world is rendered useless if users can't access it in a quick and easy fashion. This is content provision 101. At the moment the disparate nature of the Web produces the conundrum identified above where by the growth in availability is coupled with an ineffective form of organization thus rendering the dynamic benefits of the Web useless. A number of key players have already identified this problem and a number of models have either launched or begun development. Among these are Amazon.Com, Sidewalk New York, Access, and Columbia International Affairs Online.

Early forms of the shakedown are exemplified through the rise of internet service providers such as America Online, CompuServe, and Prodigy. The creation of these virtual communities not only allowed users to have access to the net but they created a place for users to congregate as well as aggregate and share information. Early services such as these are models for aggregating users in a single place and presenting them with a number of simulations options. Entering chat rooms about gardening, dating, car repair, investing etc. have proven wildly popular in this early stage of internet exploitation. Along with member to member interaction there are the more traditional vendor member relationships such as publications users can browse, read, download, and/or print.

A number of observations are useful about these early models as they provide a useful entry point into exploring how the Web can be used most effectively. First, I will talk about the centralization of information. I then move to the second stage of service or content provision, the provision or creation of a virtual community. These communities not only value the standard ways of measuring whether or not certain types of information are valuable, product loyalty or name brand recognition, but they have developed the natural trust between members of an established community exemplified by the "word of mouth" model. Finally I

discuss how and why these communities gain in value over time and how we, as service providers should proceed to ensure an ever increasing value in our services.

Centralization

The resources of international affairs experts are vast. They are also, for the moment, disparate. This is the problem facing content providers of our nature. This is not a new problem and it is not unsolvable. Early journalism depended on a reporter running all over town to get the background for a story in a haphazard way. Now with the evolution of Lexus Nexus and other related services that centralize a good deal of that background material in an efficient and reliable fashion that reporter can get a days worth of background material in a matter of minutes or seconds.

Amazon.Com and Sidewalk New York are two examples of the type of massive centralization of information I am talking about. Amazon.Com boast over 2 million titles from just about every outfit that has it together enough to print and bind a volume. Along with the simple listing of the text, auxiliary information about the book is also provided to the reader, including the usual print reviews and comments from members of the Amazon community. So, at the simple request for John Hagel and Arthur G. Armstrong's *net. gain*, you not only have the propaganda from the publisher but you have the trusted reviews view and your peer's comments. Just about all the information you need to make the decision to purchase the book or not.

Sidewalk New York, one of ten comprehensive city guides to be launched by Microsoft over the next two years, catalogues the hundreds of thousands of goings-on in the city of New York in an easily searchable easily useable fashion. Again, similar to the Amazon.Com model, Sidewalk relies on the database of the Village Voice and the discriminating expertise of a number of area editors as well as the users of Sidewalk to produce the most comprehensive listings guide to New York on the Web. If something falls through the cracks there is a forum for users to submit events. There are also sections of the site specifically dedicated to member to member information, say a clerk at a record store recommending his top five or ten picks for the week. And, of course there is always on every page a place for user comments and feedback.

At Columbia International Affairs Online, (and I use this example not only because it is the one I am most familiar with but because I truly believe that nothing of this nature exists in international affairs at the moment) we have recognized the disparate nature of relevant analytical material in international affairs and have created a site that collapses a static web site and a traditional database. Yet for all the technology in the world the real quest remains the centralization of high quality content, a process which is as old as the day is long, one that revolves around peer review, word of mouth, and the occasional risk taking.

What we have done is gone to a number of well respected universities, think tanks, and in some cases government agencies in the United States and abroad -- 40 for launch -- and collected from them various forms of gray literature: working papers, conference proceedings and the relevant publishable papers and are publishing the full texts of these works. In addition we are in the process of negotiating with a number of key journals in the field, Foreign Affairs, Foreign Policy, International Organization, International Affairs and the World Policy Journal to include the full texts of the respective journals. Finally we are

launching the site with the full text of 12 Columbia University Press books, with plans to include the full text of books from the CATO Institute and the American Enterprise Institute.

I believe this to be the largest full text database of high end analytical material available on the Web. It combines breadth with authority and ensures the user that he or she is not missing any valuable information. This, of course, should be the goal of centralizing these sorts of vast amounts of information. Seamless no, comprehensive yes.³

Creating the Virtual Community: Shifting power from vendor to member

When one looks for a new restaurant, or a new journal one often exercises both traditional modes of review such a brand name recognition as well as the a fore mentioned word of mouth. In New York, people look to Ruth Reichel for restaurant recommendations but then bolster their decisions with input from friends or family who tell them of their own experiences in the same place. Similarly when a new journal hits the scene the relevant publications in the field review the content and render a decision. These decisions are then foiled by colleges' own opinions of the new publication.

For a good example of this I return to Amazon.Com. When a book is released it immediately is put on sale for Web users. Accompanying the publishers book description are the reviews from the New York Times book Review, LA Review, London Review of Books etc. In addition users are encouraged to post their own thoughts on the book. Early research is showing that these postings are often definitive as to the sales of a particular volume. What this represents is a shift in power from the traditional model where the upper hand was held by the vendor to one where the upper hand is held by the customer.

Many services are adjusting to this sea change by incorporating various forms of push technology into the customization features of their products. Sidewalk asks users for a profile that allows the push function of the site to alert them of relevant goings-on in the city, usually by email. So, when the Lincoln Center Chamber Music Society posts a concert of Beethoven's Sting Quartets, those people whose profiles match up in the relevant area of classical music they are shot out an email with the URL attached and invited to come to the site to get the scoop on the upcoming concert.

At CIAO we are using the same technology to push information to users information about relevant new publications as they come online in the database. So, when a new conference on the Middle-East peace process is posted those users who have noted an interest in conflict resolution and or the Middle-East an email is sent to them with the relevant information inviting them to come to the site and review the piece for themselves. All of our focus groups have suggested that this is the model most beneficial and most often requested by users at the moment. We must respond to what our users request.

³ I am aware that there are a number of holes in our content at the moment and the thought of compiling a seamless stream of information at any time is rather daunting. My point here is that some of this information exists on the web and some of it does not but it is extremely relevant and useful to a wide variety of people involved in international affairs.

Being Innovative AND Responsive: Keeping your community in Mind

The on ramp to the information superhighway is now littered with the casualties of good ideas gone bad. From Apple Computers to the interactive television, ideas that lost sight of what the customer or user wanted as opposed to what the developer thought the customer wanted proves that not all technological innovation automatically means a successful model for user integration.

Virtual communities, just like regular community are dynamic spaces of information exchange and innovation. However, too much innovation without the consultation of your community can result in unwanted developments such as a loss of membership or wasted resource expenditures. Suppose the Watson Institute at Brown University suddenly begins to produce papers of substantially lower quality than what the community has come to expect. How helpful is it to continue to push that information to your clients? Users, across the board, are saying less information but of be sure the information that we do receive is of extremely high quality. Why not remove Watson and replace it with a new paper series from the University of Ulster that is producing innovation solutions to conflict resolution? Or, why not poll the community from time to time to see what new material is out there, what people are using, and in what fashion?

The point here is simple: do not lose site of your virtual community. Your virtual community is your largest resource in making your resource as valuable as you can make it. If one loses sight of what customers or users want the community will eventually fold.

CIAO as a model for information aggregation and friendly commerce

Unlike some, whose job it is to do Web development of various types, most people do not have the time or the energy or the desire to surf the Web in an attempt to prune out the useful and good information. In research done for the development of Columbia International Affairs Online most scholars, students, and professionals told us that the main element that would convince them not only that the Web was a useful resource but to, in fact, use it as a daily resource was higher quality information in an easy to use format.

The fact is that in the analytical world there simply is not a great supply of high end material. There are a few essential major journals, then a few more specifically related to area specific study and the remainder is, to be blunt, not essential. The problem still remains; the major journals are not entirely available on the web -- one does not even operate its own server -- and they are located at five different web addresses. What if they we all housed under one roof, a special house for the essential analytical information in international affairs? Would people consult them more often? Would they download or print articles and read them on the train, plain , or in an automobile? The answer cam back a resounding yes.

Its not so much that people don't already consult these essential texts but rather if they could do so from the comfort of their desks, homes, or even while in transit from one continent to the next they would do so on a more regular basis. However, the full text repurposing of material is by far not the most innovative use of the web and so the search continues to find out how to add value to your community.

I believe that through the process of aggregating essential information and creating a virtual community of scholars, policy makers, and other professionals this is where your essential value-added is going to come. As I see it, the value added is generated by the community itself. The trust of certain member's recommendations, the development of various fractal layers of the community, are just two ways in which extra value is generated.

As I noted before no one has the time to keep their hands on the pulse all the time. The virtual communities that CIAO hopes to create will be little enclaves where experts and new comers alike can share valued information, evaluate emerging tendencies and proclaim the deaths of out dated modes of thought or decision making. That this process can happen in real time with an exponentially greater amount of people from a various assundry of perspectives is something unlike anything that has occurred to date.

Conclusion: The Next Wave

Make no mistake, the future is bright. With the perspective of the first generation of web use in our pockets we stand in a prime position to make the second a hundred fold better. The centralization of information, the ability to structure it in ways that allow users more flexibility along with increased efficiency is an opportunity we can not let slip by. I am confident will not.

Information technology -- the Web in particular -- is an amazingly empowering tool which, used in the right manner for the right situation, can make our work that much more effective. The keys to success are keeping in mind the technologies we choose to employ in our service, in what manner, and for whom we are aiming to aid. These simple guidelines will allow us to engage in the development of tools which utilize the specific features in a pinpoint fashion building new mechanisms for our collective benefit.

Exploiting the various features the Web has to offer, centralizing information, yielding to the member/user, and catering to the needs of your specific community are the key points I have stressed in the creation of a content provision model. It is an exciting time to be involved at the nexus of emerging technologies and international affairs. In a sense international affairs are the logical extension of these technologies. Borders are becoming simultaneously more and less relevant. Trade is spilling over national boundaries creating new conflicts that require the aid of this technology in order to prevent them from reaching irreconcilable ends. The Web is one tool in an ever-growing arsenal of technological weapons. We should not be afraid to use it to our mutually beneficial ends.

Science and Technology Information Dissemination and Promotion at PCIERD-DOST, Philippines

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ABSTRACT

Grey literature in science and technology (S&T) may have been used and have rendered benefits in most countries but in the Philippines, its use and potentials have yet to be fully understood or tapped especially in the context of technology transfer and technology adoption and in contributing to the overall information dissemination activities, particularly at the Department of Science and Technology (DOST), the premier S&T agency in the country. The Philippine Council for Industry and Energy Research and Development (PCIERD) is one of the sectoral planning agencies of the DOST which actually generates grey literature but whose impact need to be assessed.

While the Philippines has yet to fully invest in science and technology (S&T), which are considered the wheels that would propel a country to industrialization, there is a concomitant task for its agencies to disseminate information and promote S&T with the ultimate aim of creating an S&T culture among its populace.

A number of activities are conducted along this line using the tri-media (radio, tv and print) including other special activities like technology for a regional and national technology exhibitions, technology fairs and technology investment clinics. DOST and all its agencies have also established access to the Internet with its own homepage. This has facilitated the transfer of information within and outside the country.

The printed medium is considered a potent tool in the dissemination and promotion of S&T information. These would include proceedings, technology brochures or flyers, newsletters or other technical materials or what are called grey literature that may be distributed to target audience, which includes all regions. But in so doing, linkages or networking has to be set up to facilitate the exchange of information so that development will reach all parts of the country.

This paper is presented in an effort to give some views on the extent of the use of grey literature that are being generated at DOST but which may not yet be fully used in the context of technology transfer. On the other hand, it is being presented to get some views and insights on the use of grey literature in science and technology particularly in a networked environment.

1. INTRODUCTION

The Philippine Council for Industry and Energy Research and Development (PCIERD) of the Department of Science and Technology (DOST) is mandated to serve as the central agency in the planning, monitoring and promotion of scientific and technological research for application in the industry, energy, utilities and infrastructure sectors. With this diversified areas, PCIERD takes charge of eight (8) out of the fifteen (15) leading - sectors that have been identified by DOST as having high contributory potential to the attainment of industrialization for the Philippines. These are process, food and feed, metals and engineering, mining and minerals, textile, energy, transportation and communications and construction. PCIERD also gives importance to the development of the engineering manpower and to the conduct of environment-related R&D projects. It supports the DOST's science and technology (S&T) thrusts as presented in the Science and Technology Agenda for National Development (STAND 2000), under which are more specific areas that need to be developed to contribute to industrialization. Since its inception, PCIERD has acknowledged the need to establish and maintain a strong linkage with the private sector which is the direct user of the technologies or processes developed.

2. PCIERD IN THE DOST SYSTEM

PCIERD is one of the five (5) sectoral planning councils of the DOST. It has the most diversified areas of coverage, hence, its manpower is also composed of technical people or engineers with different areas of specialization who are qualified to provide technical assistance in the implementation of R&D activities. For policy and broad management decisions, PCIERD is guided by a Governing Council composed of representatives from both private and government sectors with the Council Executive Staff as its implementing and support structure. A thorough review of R&D proposals is done by a Technical Advisory Committee and Technical Planning and Review Committees composed of experts in PCIERD's sectors.

In the DOST system therefore, all R&D project proposals pertaining to the areas under PCIERD pass through all the above channels. PCIERD likewise spearheads all other S&T activities in the industry and energy sectors including the development of the engineering manpower and the conduct of environment-related R&D projects.

PCIERD provides technical and financial assistance to seven (7) institutes in the DOST system, twelve (12) regional S&T offices, the private sector, academe and all other agencies that conduct R&D. In all these activities, the private sector is strongly encouraged to participate to ensure that even at the start of an R&D project, there is already a taker of the technology to be developed.

PCIERD plays a key role in the implementation of the STAND 2000 and adheres to the following components:

1. development of export winners (i.e. products and services which have high potential in capturing substantial market share);
2. provision of basic domestic needs (i.e. products and services deemed necessary to sustain a productive population and provide infrastructure for both;
3. development of support industries (i.e. industries crucial to both export and domestic markets; and
4. revitalization of the coconut industry so that its decline will be reversed.

It undertakes an aggressive application of science and technology in harnessing the country's S&T capabilities in its sectoral concerns to come up with the expected outputs of the STAND 2000. The following are the specific STAND commodities under PCIERD:

A. Export Winners

1. Fruits
2. Marine Products
3. Gifts, Toys and Housewares
4. Furniture
5. Metals Fabrication
6. Fashion Accessories

B. Basic Domestic Needs

1. Food
2. Housing
3. Health and Nutrition
4. Clothing
5. Energy
6. Transport
7. Disaster/Hazard Mitigation

C. Support Industries

1. Packaging
2. Metals
3. Chemicals

D. Coconut Industry

1. Alternative Processing Methods
2. Improved/New Products

In giving directions to research in its sectoral coverage, PCIERD likewise looks into the impact that the developments of new products have on the environment. PCIERD's Environmental Plan enables the Council to support and develop technologies not only for the advancement within its sectors, but also be able to contribute more meaningfully to the universal task of protecting and saving the environment.

Also in the DOST system, PCIERD takes charge of implementing the engineering component of the overall DOST Engineering and Science Education Project (ESEP). This and several other projects are under its umbrella program known as the Engineering Manpower Development Project (EMDP). The specific project entitled "Support to the Graduate Programs in Engineering" implemented in two leading universities in the Philippines, is a continuing scholarship program which can be availed of by qualified applicants for MS and Ph.D. degrees in engineering courses.

3. SCIENCE AND TECHNOLOGY INFORMATION DISSEMINATION EFFORTS OF PCIERD

Research and development (R&D) is the focus of the activities of DOST and its agencies and the most important activities after research and development are dissemination of the results of an R&D, technology transfer and technology adoption. R&D comes in two levels: basic research or applied research.

PCIERD provides technical assistance and financial assistance to R&D project proposals that fall under its sectoral coverage, which have been approved by its Governing Council. In its fifteen (15) years of existence, a number of technologies or processes have been developed. The challenge has always been in the effective dissemination and eventual technology transfer and adoption of the technologies, not allowing them be wasted in the laboratory shelves including the time and money that went with the activity.

It is at this point that communication processes for the dissemination of information up to the ultimate activity of technology transfer become crucial and more important because the measure of success for such R&D activities would be the adoption and use of such technologies or processes.

Today, more than ever, the DOST and its agencies are embarking on an intensive information dissemination campaign, not only for its technologies but for the department itself to make people aware about its existence and how it could contribute to overall national development. It promotes what social scientists say that "the heart of the development process is technology. It enables people to extend their horizons beyond the mere struggle for existence. It also harnesses the intelligence of human beings and the force of nature to meet the needs of mankind."

On this premise, PCIERD has put in place regular activities to promote research and development activities in its sectors, i.e. from the start of the project up to its completion. It has to a certain extent, been successful in achieving the transfer of technology, but there is more to be done. PCIERD continues to look into other avenues with which it could improve its dissemination activities. Generally, the Industry Relations and Information Division of PCIERD takes charge of the implementation of these activities. The following are the activities being conducted by PCIERD regularly in a year:

A. QUARTERLY TECHNICAL FORA

This is conducted when an R&D project has been completed and where there are significant results. Also, this activity is undertaken in response to requests by potential technology users on a specific technology. The project leader serves as the resource person and always, provides the participants a technical paper or a brochure about the technology for reference. An open forum after the technology presentation is conducted where the participants give their comments, views or suggestions about the project. From this, the project leader and PCIERD are able to improve or make changes on the technology or process.

B. ANNUAL DOST TECHNOLOGY FAIR

The technology fair is one big event for the DOST and its agencies because it showcases technologies that are already commercializable or are ready for commercialization and where business agreements or investments between technology generator and potential adopter are already discussed usually during the Investors' Forum. Moreover, it presents the various services of the DOST agencies and other government agencies that conduct R&D and the products that are developed from the technologies. Also, it is during this event that the collaboration among government and the private sector and the academic community is highlighted through the collaborative R&D projects undertaken. PCIERD actively participates in this event where it usually presents 5-10 technologies with product samples and prototypes and the corresponding technology flyer or brochure.

C. NATIONAL AND REGIONAL S&T FAIRS

PCIERD sees to it that it participates in national and regional S&T fairs in an effort to boost its information campaign on technologies, technology transfer and commercialization as well as the services it offers. Printed materials i.e. technology flyers or brochures are always part of these activities.

D. NEWSLETTER AND OTHER PUBLICATIONS

Since its inception in 1982, PCIERD already saw the need to come with its newsletter as it believes that the printed materials is still an important information tool. Today, even with the so-called information highway that we are in, the printed material still presents its usefulness particularly in storing information and more specially in reaching the remotest areas, where the computer is still an unknown thing. PCIERD's newsletter - PROGRESS - is published quarterly and is distributed to government agencies, the private sector and the academe. It presents the activities of the Council, particularly the projects that have been completed as well as those that have been newly approved by its Governing Council. It also informs the public about new policies, new agreements forged between PCIERD and private entities as regards the conduct of a research project, as well as global trends in PCIERD's areas. PCIERD also publishes other materials like Annual Report, Guidebook on the Implementation of R&D Projects, technology flyers, institutional flyer and proceedings of technical seminars. Other publications are being lined up like the Compendium of Completed Projects for a ten-year period and a Compilation of Winning Entries in the PCIERD Search for Outstanding Research in Industry and Energy.

E. PRESS CONFERENCES/PRESS RELEASES

PCIERD has established a good relationship with the media - both television and print for the dissemination of its activities. Within a year, at least four press conferences are held, usually on the results of a completed project or on an upcoming important activity that need to be disseminated.

4. THE PCIERD INFORMATION SUPPORT INFRASTRUCTURE

Through the years, science and technology have made significant contribution towards the achievement of NICHood for the country. There may have been problems of underinvestment in S&T in the past, but this is being addressed because people are becoming aware of the benefits that S&T could provide, particularly in uplifting the way of life of people. This, I believe, is largely due to the information dissemination efforts of the DOST and its agencies coupled with the establishment of infrastructure to support such activities. There are other contributory activities to this like the prioritization of R&D projects, stronger private sector participation in government development efforts and the continued manpower development projects and skills upgrading. PCIERD has always called for a multi-sectoral participation in R&D activities, from the private sector, academe and other government agencies. For one, it is the industry that has the actual feel of what are needed for a country to gain technological development and therefore know what activities should be pursued, while the academe would come up with courses that are responsive to industry. Realizing this, PCIERD put in place information support infrastructure in collaboration with the private sector and academe.

A. NETWORKING

PCIERD has thrived within a multi-sectoral environment and continues to do so. It pursues the policy that a multi-sectoral approach is effective in the implementation of R&D where there is a sharing of resources and capabilities.

Networking is manifested in R&D through joint projects usually initiated by the government sector in collaboration with the private sector and academe. Philippine universities provide a large manpower resource base which can be tapped to help industry and vice-versa. The basic concept in networking, especially in R&D aspect, is that it will facilitate technology adoption and commercialization process.

PCIERD first established the Manufacturing Linkage Program (MLP) where the universities and the manufacturing sector agreed to upgrade the status of manufacturing practice so that both industry and the university are able to draw top caliber individuals in the field of manufacturing.

In this setup, engineers are encouraged to go into manufacturing because this is a major contributor to economic development in same manner that industry gives due recognition and importance to good engineers in manufacturing. This is done through the conduct of selected pilot projects between industry and the university and the exchange of know-how between the university and the manufacturing industry. The incorporation of manufacturing technology and practices applicable to local conditions into the engineering curriculum is also one strategy of the program. The MLP became successful and it was replicated in other network member schools.

B. INTERNATIONAL LINKAGES

As ASEAN member, the Philippines has established linkages with international communities for collaborative R&D and other S&T activities. PCIERD, through its Executive Director, seats as Country Coordinator in several communities like ASEAN - New Zealand, Australia, Canada, Japan and European Economic Community. The transfer of information and technologies in the PCIERD areas have been successfully undertaken through these linkages. Further, PCIERD maintains membership in international information networks like the INNERTAP. PCIERD likewise actively participates in the DOST-initiated information support structure.

C. MEDIA CORE

This is concerned with the public relations and information services of DOST through a massive S&T information campaign in the tri-media and in the near future, the Internet. It is composed of DOST information officers tasked to promote research projects, technologies and related activities through various communication methods and approaches nationwide.

D. SciNET-PHILIPPINES

The Science and Technology Information Network of the Philippines (SciNET-Philippines) generally aims to promote and improve the flow and use of S&T information through resource sharing and networking. It is composed of libraries and information centers of 21 agencies under the DOST committed to provide assistance and support to boost science and technology through information dissemination and retrieval system. The consortium of libraries and information centers was conceived as a medium of information exchange, utilization and application of S&T information in development activities to achieve socio-economic benefits to support the national program through information infrastructure and services.

E. R&D BUDGET DIALOGUE

The R&D budget dialogues are conducted annually with the academe and government institutions in identified seven zones throughout the country for the purpose of rationalizing the use of R&D funds by research institutions. This is also conducted to check on duplications of project proposals and whether a project proposal is S&T-related or not.

PCIERD takes on a significant role in the R&D activities of state colleges and universities as well as R&D institutes by redirecting their R&D policies and thrusts towards the needs of the industry and towards R&D that would lead to marketable products.

5. ASSESSMENT OF GREY LITERATURE IN SCIENCE AND TECHNOLOGY

The S&T information dissemination and promotion activities of PCIERD are well placed and carried out in the best efforts but with the information technology age and with the so-called information highway, there also emerges new ideas, perspectives, designs, methods and processes for the distribution or marketing of information.

With its complex yet comprehensive areas of coverage, PCIERD generates a sea of information, relevant information to economic and technological development that need to be assessed and published for use by its clientele. These are grey literature which could be used to enhance S&T information dissemination activities but whose purpose may not yet be really appreciated or not known at all. In all the activities of PCIERD, grey literature are being developed and used. Grey literature, in fact, seems to form the bulk of printed technical materials at DOST and these have been used to come up with the science and technology master plans. These have also been distributed but only to a selected few, and sometimes not even to those who are more in need of it like the private sector.

While PCIERD lives in a multi-sectoral environment, with the academe and private sector at its partners in all in its endeavors, and while the sharing of resources and capabilities has proven beneficial, PCIERD would like to look into grey literature in science and technology as not only another tool but a potent tool to beef up its information dissemination activities. PCIERD is already producing or generating grey literature but these should be evaluated and redesigned for it serve its purpose which is to be used or accessed by all agencies which PCIERD works with. There is also need for grey literature to be identified within the DOST so that there would be a common understanding especially if it is being used within a network. Having a limited insight on the use of grey literature in science and technology has, nonetheless, opened a whole view of its impact which need only to be appreciated, because grey literature, as it is, is indeed an important tool in information dissemination and in eventual technology transfer.

For this reason, the author looks forward to listening to the experience of other agencies or countries on the use of grey literature, particularly in science and technology. The author also wishes to convey her gratitude to the conference organizer, Dr. Dominic Farace for his invaluable assistance for her to be able to attend the GL'97 and GL observership.

E-Print Archives: a new communication pattern for GL documents

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Abstract

E-prints archives are a new model for the diffusion of scientific information which exploits the interactive characteristics of networked communication. The aim of this paper is to outline current trends in their production and distribution, taking into consideration institutions which provide them and the submission procedures they use. Special attention is attached to differences in the downloading of documents and the updating of archives, as well as the way in which issues such as copyright and peer review are addressed by each archive.

1. Introduction

Harnad's evocative metaphor 'scholarly skywriting' conjures up the dream of many researchers; namely, the possibility to draw on a continuous contribution and global exchange of ideas and experience. Today the dream looks set to come true thanks to networks which are 'not only incomparably more thorough and systematic in [their] distribution, potentially global in scale, and almost instantaneous in speed, but so unprecedentedly interactive that [they] will substantially restructure the pursuit of knowledge' [1,2].

The high energy physics (hep-th) e-print archive developed by Paul Ginsparg at the Los Alamos National Laboratory in 1991 represents another step forward towards a form of network use which integrates communication and information dissemination. Ginsparg's archive began as 'spare time project' [3] for the implementation of a preprints electronic distribution system for a list of 160 subscribers, but is now turning into a system of automatic acquisition, storing, retrieval and distribution of electronic documents. At present it is used by 35.000 subscribers over 70 countries and processes more than 70.000 electronic transactions per day [4].

The archive's success should be measured not so much in terms of the number of its users or of the disciplines it encompasses, but by the fact that it offers a model of rapid, direct and relatively cheap interaction in which researchers participate as producers, distributors and users of information. Network usage had already set this process in motion by facilitating direct communication (E-mail, discussion lists) and document transmission (FTP),

as well as providing information in the form of documents, bibliographies and data bases. [What changes with e-print archives is that they establish an *autonomous self-contained* information circuit with its own working rules and are thus a primary source of information and an invaluable working tool.]

Although it was not Ginsparg's intention to develop a system to replace scientific publishing, his e-print archive fills the information gap caused, above all, by publication delays. The more the e-print archive becomes a widespread model for high-speed, easy access and free information exchange, the more scientific journals are relegated to an archive function, important only for official endorsement [5]. This coincides with what is a transition period for publishing, and scientific publishing in particular, which is having to come to terms with networked information and is trying and testing new models of information dissemination through electronic journals.

The term grey literature (GL) is never mentioned in the numerous articles or at APS Workshops or in the discussion lists which have livened up the debate on e-print archives. There is much talk, however, of a pre-existing *preprint culture* which has facilitated the transition from the diffusion of preprints on paper to a system of automatic distribution of electronic preprints.

The reasons for the success of the e-print archive in Los Alamos are, however, similar to the ones which have determined the development of GL, which started as a quick, economical communication channel for the exchange of research results among a small number of experts, outside normal commercial channels. Some of the intrinsic features of traditional paper GL have been highlighted by the networked diffusion. The electronic document becomes accessible to a virtually unlimited number of users and thus lowers - at least, potentially - the difficulties of retrieval typical of traditional GL. Moreover, diffusion is faster and distribution is less expensive, without spoiling the layout of the document which, on the contrary, is becoming similar to the final published version.

This is why the communication model developed by Ginsparg raises in a more urgent manner the questions of information quality and intellectual property already posed by GL and, even more evidently, by all the information available on the network.

The aim of this paper is to outline current trends in the production and distribution of electronic preprint archives available on web; in particular, to make a comparison between different e-print archives, taking into consideration institutions which make e-print archives available on web and the submission procedures used. The comparison between procedures will in fact provide useful indications on the role and use of these archives also taking into account other types of information available on the network.

The first part of the paper compares definitions of preprint and e-print and discusses relevant problems; the second part provides a brief description of e-print archive providers and the final part presents the results of the comparison of the different archives.

2. Traditional GL and electronic GL

There is an evident need [6, 7, 8] to redefine GL in the light of the changes brought about by network use. The intrinsic difficulty involved in defining this type of document is due precisely to its informal character, which eludes rigid classification and adapts according to type of producer, production and diffusion methods and disciplinary fields.

Apart from what has been identified as *grey information* [9], networks constitute the channel through which information producers can circulate a large quantity of information to a virtually global user community. Many think that the transformation of paper GL into electronic GL has been a natural evolution [10], but the organisation of centralised or distributed information archives is a new factor, especially if those who have produced the information then manage and supply it directly.

This is why e-print archives are such an emblematic case. Of all GL documents, they are the ones which, in terms of content and format, come closest to the final version published in the journals. In fact, technical reports and theses, for example, are hardly ever published in an unabridged form, but preprints are prepared with a view to publication. One definition of preprints [11] evidences their characteristics and aims: 'An individual author's or group's work distributed among colleagues and field specialists in order to obtain feedback before its publication as a journal article or a conference paper. It often contains references to the journal or conference to which it has been or is going to be submitted'. Following the life cycle of the preprint is not always easy, however, because the reference to the journal may prove to be inexact. This is why the preprint is often cited as such [12], confirming its importance as a primary source of information.

The passage from paper preprint to e-print may, at first sight, seem a simple change in medium, as highlighted by the APS definition [13]: 'a preprint (prepublished article) in electronic form'. However, the APS goes on to underline the differences that exist 'The concept is now more nebulous, and is general enough to include any electronic work circulated by the author outside of the traditional publishing environment. We will define it here to mean any electronic (not necessarily printable) research-related information provided by the author'. This definition broadens the concept of e-print considerably, comprising not only other types of GL but also *any electronic information*; at the same time, it attributes a primary role to the author who circulates the information. There is no mention either of the institution where the research was performed or the primary reason for circulating the preprint (i.e. obtain feedback). The emphasis on the author, distributor of research work, refers to an accepted procedure which combines "non-peer reviewed in private circulation to friendly reviewers" and "non-peer reviewed in public circulation" [14]. The latter was generally carried out by the institution where the research was performed through the production and distribution of its collections of reports.

In most e-print archives, as we shall see, it is the first method which prevails in so far as it is the author who submits his work to the archive. In the circulation of traditional GL, the two procedures cited by Harnish exist

side by side. The difference between them is that circulation performed by institution has always been one of the strongest guarantees of the contents of the document, as well as the main source of its availability. This is also highlighted by the specific cataloguing rules of GL [15, 16] in which information about the corporate source is compulsory.

3. A profile of e-print archive providers

The analysis makes a comparison between e-print archives (often referred to as e-print servers) available on the network and highlights the differences in submission procedures. This analysis has to take into account the institutional role of archive providers, since this often determines their choice of collection and distribution procedures. New tendencies emerge *vis-à-vis* those involved at different levels in the acquisition and diffusion of information: authors, scientific publishers and also libraries. A brief description of the information which each provider networks is given in an attempt to highlight the general framework into which e-print archives fit.

The archives analysed are managed by three types of organisation: scientific publishers, research establishments and university departments. Members of the first group include the American Mathematical Society (AMS) and the American Physical Society (APS). Members of the second comprise the European Laboratory of Particle Physics (CERN), the Los Alamos National Laboratory (LANL) and the Stanford Linear Accelerator Center (SLAC). The third includes the Department of Mathematics of the University of Illinois, the Department of Mathematics of the University of Texas and the Department of Economics of the University of Washington.

These organisations were chosen using the archive pioneered by Ginsparg at Los Alamos as a starting point and by then analysing links to other archives which *reconstruct* a significant network of information and collaboration. Their affinity is, first and foremost, thematic in so far as they share a hard core of archives covering sectors of physics and mathematics, the disciplines with the greatest established *preprint culture*. Of the archives not directly linked by discipline yet cited by LANL, the most conspicuous exception is the Department of Economics of the University of Washington, which uses the same software as Los Alamos to distribute working papers. This archive is included in the analysis because it is an example of transferability of these information systems to other disciplinary fields and to other GL documents.

A quantitative analysis to assess the diffusion of e-print archives in other disciplines more systematically is planned for the future.

This paper does not, however, take into account those web sites which, although linked by LANL and providing preprint lists or technical reports, do not offer functions such as: information searches, electronic document submission and notification by e-mail of freshly submitted documents. Such examples lack the characteristics which make the e-print archive an *autonomous self-contained* system covering all the phases of the information cycle from acquisition to diffusion.

It is worth pointing out, however, that many institutions are now about to set up e-print archives, a fact which confirms the ever increasing diffusion of an information system that will be interesting to monitor.

3.1 Scientific publishers

AMS and APS boast 30,000 mathematicians and 41,000 physicists respectively worldwide and publish some of the most important scientific journals in the field. Both also distribute information via network, produce electronic journals and have their own e-print archives (since 1995 and 1996 respectively).

Their web sites [17,18] provide information about the structure, roles and tasks of each organisation, publicise conferences and seminars and promote discussion lists. The information they offer about publications produced is extremely rich: it includes advertisements for new publications, the fields covered by the various journals, the composition of editorial boards and information about subscription rates. Furthermore, free services such as browsing through tables of contents of current and previous issues of electronic journals and the search of abstracts enhance the gamut of information available and also serve as an important promotional support.

Other paid services, such as the AMS MathSciNet, full-text article search functions and links to related APS papers give an idea of how publishing is changing. Again, what we are confronted with is not so much a change in medium as the exploitation of logical interconnection between information in an effort to meet the information needs of the scientific community. Futuristic scenarios - library catalogues, data bases and journals as a single interconnected data base [19] or the production of personalised journals irrespective of single titles or subscriptions, tailored directly by users [20] - are already technologically feasible. To make them possible, the various publishers need to collaborate more closely both together and with information specialists and, what is more complex and slower, the habits and attitudes of final users will also have to change.

This is the framework within which e-print archives constitute a further variable in the evolution of electronic publishing. The fact that scientific publishers promote debates and provide e-print archives suggest, on the one hand, that they are worried about losing a consolidated group of readers and, on the other, that they feel the need for more rapid, effective means of disseminating information. It is an interesting fact that APS is now promoting the diffusion of electronic journals with differentiated subscription charges, encouraging authors to submit electronic format articles to their peer review journals, while, at the same time, stating their "commitment to making submissions to APS journals easier from all e-print servers" [21] in order to facilitate, among other things, communication between the author of the article and the referee and to reduce delays in publication. The AMS instead intends "to create a kind of umbrella for all mathematical preprints on the net" taking the "lead in co-ordinating that effort" [21].

3.2 Research establishments

CERN, LANL and SLAC are among the world's most prestigious particle physics laboratories. As is well known, research in this field demands sophisticated, expensive equipment, which is generally centralised in a handful of organisations, in which teams of researchers, many of whom come from universities and other research institutions, carry out their experiments. The community of physicists is famous for being organised into teamwork [23] whose 'high task interdependence' requires close collaboration among researchers, who sometimes work in centres that are far from one another. Consequently, compared to other disciplines, physics requires a 'more communication-intensive form of communication' [24]. Furthermore, physicists form a scientific community which is used to exploiting the information technologies and which has been quick to adopt exchange formats such as TeX to transmit texts and special characters.

The need to receive updated information about research results to make up for publication delays (which are greater in mathematics and physics than in other disciplines such as, for example, chemistry), removes attention from issues related to peer review - partly because peer review is an implicit part of teamwork anyway. For these reasons, the e-print archive may appear to some [25] as an experiment which "works beautifully in a small community of people who work in harmony with each other and know each other's reputation".

The above-mentioned preprint culture is evident in the respective web sites [26, 27, 28], which highlight the close collaboration present among the three laboratories and also in the sector of information exchange and integration provided by libraries. Their web pages all display institutional information, news about research activities, seminars and conferences and, together with links to documents and sites of interest, help create a virtual library for high-energy physicists.

The main difference between them is one of management. Whereas LANL has completely automated e-print submissions, storage and diffusion procedures, both CERN and SLAC offer public access to the data bases available in their respective libraries. It may even be incorrect to consider the latter as real e-print archives, although both CERN and SLAC provide links to full texts of documents, allow browsing and search, and notify listserver subscribers of new e-prints.

The common feature of these information services is the high speed with which they disseminate information. In some LANL archives, the e-prints submitted are available on the days they are received, while in others mailings and web availability are weekly updated on Thursdays. The CERN and SLAC libraries also disseminate information *on the fly*, supplementing their own data bases with links to the full texts of Los Alamos e-prints and with information from other HEP institutions.

Both the SLAC's SPIRES-HEP data base, the result of a joint project in conjunction with DESY Libraries, and the CERN's Alice Integrated Library System supply bibliographic information about e-prints and preprints from other HEP institutions such as Fermilab, IETP-Moscow, IFVE-Serpukhov, KEK, Kyoto University and so on. Since 1994 CERN, which has a dedicated

preprint server, has scanned many preprints to make their electronic version available. Both libraries are also committed to solving the problems involved in converting the different formats of document. CERN, for example, performs tasks that were carried out by SLAC until 1995, supplying a postscript version of Los Alamos e-prints, which can be then converted into PDF.

The SPIRES-HEP preprint database currently contains more than 350,000 bibliographic references to preprints, e-prints, journal articles, technical reports, conference papers and theses since 1974. CERN's ALICE system is made up, like SLAC's, of a collection of data bases, and contains bibliographic references to monographs, periodicals, conference preprints (since 1954) and e-prints, CERN Yellow Papers, progress reports and so on.

The SLAC library also produces lists of the most recent e-prints of interest for theoretical and experimental particle physicists (*Current PPF List*) and reports produced at SLAC (*New from SLAC authors*). Moreover, the list of *Top cited HEP Papers* is a citation index with hypertextual links to the full text of the document, if available. CERN has an analogous service which supplies statistics on accesses to a given e-print and links to documents that have cited the e-print.

Moving on to LANL's e-print archive, better known as xxx.lanl.archive, it is important to point out that, apart from archives dedicated to specific sectors of physics (at present 11), LANL also centrally provides archives of mathematics (4 archives), non-linear science (5 archives), computation and language and, since November 1997, neuroscience (3 archives).

Finally, among the services which are supplying integrated information from different archives, HEPDOC, available from CERN, is worth mentioning. This service uses a single interface to search in the CERN library catalogue, the SLAC-SPIRES Information Retrieval System and the KEK Information System for Preprint. *One Shot World-wide preprints search* developed by the International Center for Theoretical Physics (ICTP) in Trieste is a comparable initiative [29]. It enables users to search in the most important e-print archives and hep institute catalogues.

3.3 University departments

The web pages of university sites generally provide two types of information, addressed to students and connected with research activities. The Department of Mathematics of the University of Illinois [30], the Department of Mathematics of the University of Texas [31] and the Department of Economics of the University of Washington [32] follow this pattern. Along with information about the department, study programmes for graduates and postgraduates, courses and seminars, the three departments provide information about research activities, available information sources and links to other sites of interest.

Although a more exhaustive analysis of university e-print archives would be necessary, they can be presumed to cover specialist subjects, as in the case of the archive on *Algebraic Number Theory* of the University of Illinois and on *Mathematical Physics* at the University of Texas. Nonetheless, in

this case too the peculiar characteristics of each discipline, the *research styles*, the personal and institutional collaboration and information exchanges patterns may be different.

This is why the Department of Economics of the University of Washington, based on the Los Alamos system, is so interesting. In addition to providing an archive of working papers in economics (ECONWPA) with 22 subject areas, the Department also supplies *NetEc*, a set of data bases on relevant economic subjects.

Of these, it is worth citing *BibEc* which supplies bibliographic information about the printed working papers of universities, banks and research centres; *WoPEc*, which collects bibliographic information about electronic working papers available on the Internet and *HoPec*, which supplies the addresses of other on-line working papers.

4. Analysis of e-print archive procedures

The following analysis is based on some of the distinctive characteristics of e-print archives.

4.1 Electronic submission

Table 1 shows how e-prints can be submitted electronically. Although FTP is the most widely used submission procedure, it is important to note that each archive generally meets user requirements by offering more than one procedure.

Table 1
Electronic submission

e-print archives	ftp	e-mail	www
Am Math. Soc. Prep. Server		x	x
Am. Phys. Soc. Prep. Server	x		x
CERN In-house prep.	x		
CERN scanned & e-prints	x		x
LANL xxx. e-print	x	x	x
SLAC Hep Preprint	--	--	--
Alg. No Theory Arch.	x		
mp_arc		x	
EconWPA	x	x	x

For example, LANL's e-print archives and the Washington University Economics Department's EconWPA provide the full range of possibilities. Only the Stanford laboratory fails to allow for electronic submissions since, as we shall see below, the input to its database is performed by the library staff. It is worth pointing out, however, that FTP is used as an internal procedure to mail the documents produced to the Technical Publications

Department, which is responsible for the printing and distribution of everything produced by SLAC. Here we have a further indication of a now consolidated practise in the production of electronic documents and the use of telematic networks, even within the same organisation.

The simple and quick methods of electronic submission not only allow for the mailing of the full text of documents, but also for the processing and storage of bibliographic information and abstracts of newly submitted e-prints. In addition, as we have seen, all archives enable users to subscribe to a listserver which notifies them about bibliographic references and abstracts of new e-prints by e-mail. Besides making the diffusion of information increasingly fast and *personalised*, these procedures help to cut costs considerably. Ginasparg's claim that in 1994 the average cost of a paper was 10 cents may be contested, but the phenomenon of free access does challenge scientific publishers to review their role.

4.2 Submission source

Table 2 shows how the submission of each archive takes place: i.e., who is authorised to input the document into the e-print archive.

Table 2
Submission source

E-print archives	Internal	External.	Any author
Am Math. Soc. Prep. Server			x
Am. Phys. Soc. Prep. Server			x
CERN In-house prep.	x		
CERN scanned & e-prints		x	
LANL xxx. e-print			x
SLAC Hep Preprint	x	x	
Alg. No. Theory Arch.			x
mp_arc			x
EconWPA			x

By internal submission, we mean that the archive accepts only the documents of authorised persons, generally researchers working at the institution itself. External submission means that document inputs come from institutions collaborating on the update of the archive. This is generally the case of libraries of institutions working in similar fields which are involved in joint projects or collaboration. The third column groups those archives which accept documents from any author.

As can be seen from the table, the majority of archives accept documents from any author, while two archives, CERN and SLAC, only accept preprints from either internal or external sources. In the internal submission, the

papers in the archives document the research carried out and the results obtained within the institute, external submission shows the wide range of collaboration involved, not only in the scientific field but also, as mentioned above, between libraries.

The authorised submission to any author represents a new tendency in electronic archives. The author decides autonomously whether or not to circulate his/her paper and which archive to target.

4.3 Relationship between copyright and submission source

Table 3 presents information about the relationship between the submission source and the copyright as provided by the archives.

Table 3
Relationship between copyright and submission source

Copyright Submission source	Author's	Archive's provider	No indication
Internal			- CERN1 - SLAC
External			- CERN2 - SLAC
Any author	- AMS - LANL - Alg.Theory - EconWPA	- AMP	

Copyright was not such an obvious problem in traditional GL because the latter was distributed directly by the research institutions or by the author to a limited number of colleagues. Now, however, networked diffusion to such a high number of users has changed the scenario completely. In fact, it is said that the e-print archives fail to respect current copyright laws which, as is well known, are attributed to the journal which accepts and publishes the paper.

The table displays a reverse trend. The majority of archives attribute copyright to the author, thus stressing the close link which exists between the paper and its author. Only APS, since January 1998, has been asking authors to subscribe to a licence of "revocable non-exclusive right to copy,

publicly display and distribute the accompanying document either in the original electronic format or in other formats from it". It is also worth noting that the AMS accepts the submission of abstracts and provides the pointer to the full text on the author's URL and other e-print archives.

Only CERN and SLAC make no mention of copyright. This is probably due to the fact that being internal or, in any case, containing internally selected papers, they correspond to traditional GL. Nothing prevents researchers at these institutions, however, from sending their work to LANL archives directly.

The Information provided by the LANL Technical Publications Department is, in this case, indicative. The documents produced internally at SLAC must be submitted to this office, which assigns them a report number. They subsequently undergo a patent review prior to being eligible for publication and electronic posting to e-print archives. The Technical Publications Department also provides a copyright transfer form which "protects the author and Laboratory rights for distribution". The recommended copyright transfer form states that "The publisher, by accepting this article for publication, acknowledges the US Government's right to retain a non-exclusive, royalty-free license in and to copyright covering this article" [33].

However, the question of copyright arises again when the e-print is published. In many archives, it is possible to find an invitation to the author to respect the copyright laws of the publishing journal. This means that it is up to the publisher to agree that the text of the e-print remain in the archives for free consultation. If this is not the case, it is the author's responsibility to cancel his e-print from the archive.

4.4 Relationship between e-print lifetime and publisher information

Table 4 shows the relationship between e-print lifetime and publisher's information. E-print lifetime refers to the period of time that the archive conserves access to the full text. Three possibilities have emerged: the archive keeps the e-prints for a limited period of two years; the period is unlimited; the e-print is cancelled from the archive after its publication.

The correlation of this information is also relevant to the copyright issue dealt with in the previous table. In fact, in the third case, where the e-print is cancelled after publication, and therefore does not contain any bibliographic reference to the publishing journal, we can see that, on the one hand, copyright laws are respected and, on the other, the e-print life-cycle is mirrored in the archives. This means in practice that, once published, the paper becomes conventional literature and can be obtained as journal article. Table 4 shows that the only archive which adopts this approach is that on *Algebraic Number Theory*, which eliminates e-prints from the archive after their publication and, as a natural consequence, does not supply any bibliographic references.

The two publishers - the American Mathematical Society and the American Physical Society - assume an in-between position, only making the document available for a period of two years, but also supplying

bibliographic information about the published paper.

Table 4
Relationship between e-print lifetime and publisher information

E-print lifetime Publisher information	2 Years	No Indication	Until Publ.
	2 Years	No Indication	Until Publ.
YES	- AMS - APS	- CERN1 - CERN2 - LANL - SLAC - mp_arc - EconWPA	
NO			-Alg.Theory

All the other archives are permanent, in the sense that the e-print is always available and the bibliographic data are updated. This lends a dynamic character to the information relating to the e-print because the archives register every step in the life of the e-print, from submission to publication.

4.5 Relationship between peer-review and submission source

Table 5 provides information on the relationship between submission source and peer. It is useful, once again, to make a comparison with traditional GL, in which peer review was by implication carried out by the institute which distributed and gave the guarantee of quality to the paper. Looking at the table, we can see that this is the case with the in-house CERN archive, which states that 'such documents have already been refereed for quality, correctness, originality and relevance'. Likewise, SLAC points out that, 'reports are publications intended to meet quality standards comparable to those of refereed journals [...] Although SLAC has not established an official approval procedure for reports, quality is maintained through parallel review by members of staff for value, general interest, quality and relations to the SLAC program'.

The APS's e-print archive represents the other extreme. At the author's request, the paper can go through the peer review system so that the pre-

print can be published in a so-called 'regular physics journal'. In this case, the author chooses what is known as a 'privacy option', a controlled access to his/her pre-prints, if he/she does not want to make his/her work widely available prior to publication.

Table 5
Relationship between peer-review and submission source

Peer review Submission source	Internal	On Request	No Indication
Internal	- CERN1		
External			- CERN2 - SLAC
Any author		- APS	- LANL - alg. theory - mp_arc - econWPA

In the other archives, no such indication is given, probably because it is taken for granted that the quality of the contents and its results are the responsibility of the author.

The absence of peer review is certainly considered by many to be an obstacle to the growth of e-print archives due to the fear of an overload of low-quality information. Some observers underline the fact that existing physics e-print archives are an exception whose development is due to the particular characteristics of physics research. Others, however, maintain that author responsibility will be encouraged by wider diffusion.

In any case, it is worth noting that SLAC's *Top-cited e-print* lists and CERN's statistics constitute an indirect form of peer review based on the opinions of readers. It is also important to mention that many e-print archives intend to link comments from other researchers to the e-print. This would help reinforce the interactivity which is so essential to information exchange.

5. Conclusions

Although the advent of e-print archives probably marks the end of the phase in which GL was hard to identify and obtain, they nonetheless have an

information circuit of their own, which continues to elude the control of normal commercial channels. Free-of-charge electronic access means that the circuit is potentially unlimited, accentuates the speed of information exchange and meets the interaction needs typical of scientific communication. It also gives form to an *autonomous self-contained* system covering the entire information exchange chain, in which anyone can participate at one and the same time as producer, provider and user.

All this raises questions about the roles traditionally played by two other important components of the information chain - scientific publishers and libraries. It also calls into question rules of copyright and the quality control performed by peer review.

What is new today is the principle, followed by the majority of the archives analysed, of the author's voluntary submission of the e-print. This principle is based on the need to make the results of ongoing research immediately available without waiting for publication. The tendency to assign the copyright to the author of the document reinforces this principle. Recent changes in the APS archive and internal procedures followed by SLAC also suggest that the 'irrevocable non-exclusive right' granted to the archive or the journal protect the author from violation of copyright laws, both when the e-print is submitted and when it is subsequently printed in a journal.

The lack of peer review constitutes the main difference between articles published in journals and e-prints. As we have already seen, partial solutions have been developed by the libraries of SLAC (lists of *Top-cited papers*) and CERN, which supplies statistics reporting the number of times an e-print has been accessed. These facilities serve as searchable citation indexes and make it possible both to measure the impact of a given e-print on other papers and to access the full text of documents which cite the e-print. As these examples show, the role of libraries is becoming fundamental especially in so far as they contribute to the provision of value-added information services.

Many archives, finally, envisage the possibility of linking comment files to e-prints. Gisparg himself states that: "the archive could be partitioned into sectors, graded according to overall importance, quality of research or other useful criteria, and papers could be shifted retroactively and dictated by additional information or follow-up research" [34]. What interest researchers most is not so much the idea of "electronic clones of printed journals" as rapid effective diffusion of information with all the benefits of networked communication.

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An Eagle's eye-view of grey literature research

Part of EAGLE-Tutorial at GL'97

dr R.H.A. Wessels

Introduction

EAGLE, the producer of the database SIGLE (System for Information on Grey Literature in Europe), began in 1980 as an association of seven libraries and documentation centres from seven countries of the European Union. In 1992, membership was opened up to all European countries. As a result EAGLE now has members in 15 European countries. SIGLE covers all subject areas (1/3 technology, 1/3 social and economical sciences & humanities, 1/3 natural sciences/ medicine/ biology). SIGLE contains over 480,000 records. The volume of input to SIGLE is steadily increasing. During the mid-eighties the annual input was 20,000 records. During the mid-nineties the annual input was over 40,000 records. Input of 73,000 records is projected for the year 2000.

During this process of steady growth the members of EAGLE sometimes question whether their efforts are worthwhile. They believe that the documents described in SIGLE provide a valuable information resource, but what is the reality? The International Conferences on Grey Literature have led to more and more information being made available on this subject. In this contribution, research figures are shown which support the quality and value of grey literature.

Volume and usage

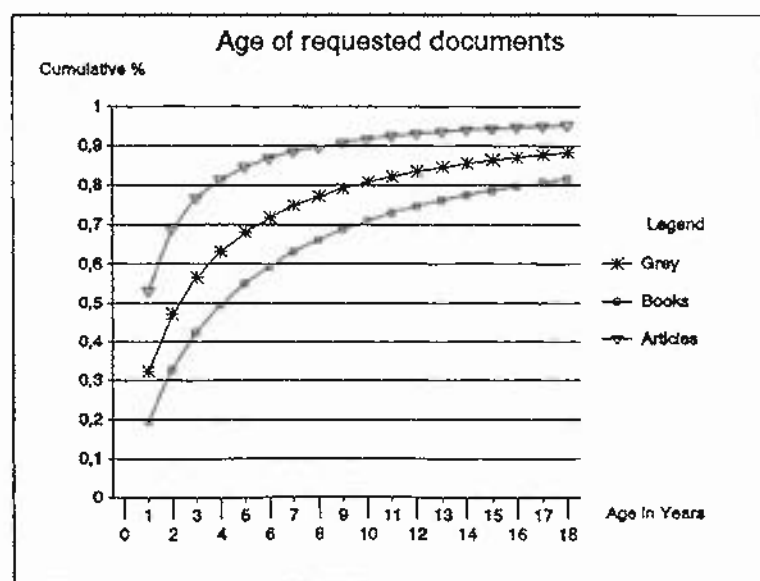
Non-commercial publications play an important role in scientific communication. Examples were mentioned at GL'93 and GL'95.

Subject area	Grey	Remarks
Agriculture	50%	All Publications
Sociology	75%	Research Projects
Energy	27%	Energy Database
All areas	60%	Developmental Countries

Grey documents are requested from libraries. Not only recent ones but also old ones.

The figure shows the age of requested documents in a library. It shows that journal articles are out of date more quickly than grey publications. Of the requested grey documents, 12% are more than 18 years old.

Those who deny the value of grey literature are predominantly commercial publishers. They argue that quality grey literature will in most cases be followed by a 'white' publication through their channels. The user simply has to wait until the commercial publisher has selected grey documents of value.



In order to research this argument, samples of bibliographic descriptions of grey documents produced 10 years ago in six subject areas were taken from the SIGLE database. For every one of the six samples a journal article database was searched to determine whether or not the grey document had in fact been followed by a journal article. The table on page 2 shows the result of these searches. In total 9% of the grey publications in the samples was found back. Some of the grey documents however were commercially published as books. Only 6% of the retrieved matching descriptions were journal articles.

Database	Sample	Found	Found
Lisa Plus	25	4	16%
Religion Index	25	3	12%
Inspec	25	3	12%
PsychLit	25	2	8%
Sociofile	25	1	4%
Compendex	25	0	0%
Total	150	13	9%

Quality

These figures show that a significant proportion of grey literature is never published 'white' and that even very old grey documents are still requested by the user. Another questions remains. Some people question the quality of grey literature, because there is no quality control, no peer review. However, analysis of a sample of grey literature producers shows that most are prestigious organizations. For example, SIGLE includes documents from:

- Max-Planck-Institut fuer Physik, Muenchen (DE).
- Technische Hochschule Aachen (DE). Inst. fuer Strahlantriebe und Turboarbeitsmaschinen.
- Siemens Solar GmbH, Muenchen (DE).
- Bundesministerium fuer Verkehr, Bonn (DE). Abt. Strassenbau.
- Daimler-Benz AG, Ulm (DE). Forschung und Technik.
- Ministere de l'Environnement, 75 - Paris (FR). Service de la Recherche et des Affaires Economiques (SRAE).
- London Univ. (GB).

EAGLE does not doubt the quality control or peer review standards of organizations like these. Most of the grey documents from these organizations are never published 'white' simply because commercial publishers do not believe they will be profitable, not because they lack quality or value.

Conventional and grey information compared

In order to understand the position of grey information in scientific communication, the last table was developed. It shows that grey information plays a role in all levels of research.

<u>Level</u>	<u>Conventional</u>	<u>Grey</u>
Front research	Personal contacts Conf. proceedings	Internet discussions Grey proceedings Original theses Reports
Research	Journal articles	Preprints Thesis on articles
Review/ education	Books	Syllabi/ Readers

Conclusion

Grey information forms a major part of scientific and technical communication. Grey documents remain unique and are rarely followed by a journal article. Most grey literature is published by prestigious organizations whose names are a guarantee for quality.

TITLE: Towards a questionnaire for monitoring GL education and training in Italy

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ABSTRACT

The development of appropriate curricula and instructional programmes requires an analysis of the life of GL documents.

GL document life goes through three main different stages as follows:

production → management → use

Of course, these activities are carried out at a level of efficiency and effectiveness depending on the "organizational context".

Each phase of this process involves "actors" with specific needs and skills which are to be identified.

This problem is not very easy to solve owing to the very fuzzy nature of GL documents.

The goal of our work is to collect information needed to conduct a survey aiming at determining an educational programme for a manager actor and deciding whether his profile is or is not independent of the nature and type of the information conveyed by a GL document. It is clear that only in the affirmative case may a general-purpose curriculum be defined for a manager whereas specific curricula are to be developed for those managers whose needs and skills depend on the nature and type of GL documents.

The survey will be conducted by an interview submitted to a number of a "qualified observers" of GL management in Italy.

The results of this survey should provide the basis for an ongoing educational programme for actors involved in the management of the GL documents collected in very large databases such as the System for Information on Grey Literature in Europe (SIGLE).

1. Introduction

During the last decade professional literature has viewed libraries as a part of a complex social system where the education of human resources represents the key point for the achievement of goals and results.

The ability to attain time-varying objectives through autonomous and interfunctional processes, where the skills of technical librarians are enriched with continuous adjustment to new situations (e. g., to the technology which is changing both the way in which professionals work and the way in which information is used), should combine with the ability to interact within a complex information system. Training for goals and results rather than for functions and duties requires a new educational attitude (sensibility) valid for integrating differences, to develop analysis and synthesis processes and, finally, to evaluate every decision in terms of advantages and risks.

This is because a librarian, particularly a GL librarian should know all the aspects of documents related to both their production and their communication, that are needed to reconstruct the information path of GL documents.

In the "era" of global information GL plays an important role and, hence, GL information specialists on one hand should accurately define the contents of GL documents and on the other hand should be able to reconstruct the "grey circuit", the productive context of GL documents, in order to design courses articulated and modulated for the best management and use of grey information.

The development of appropriate curricula and instruction programmes requires an analysis of GL "actors", namely, producers, managers and users. Each of these actors plays a specific role in the life cycle of GL documents, which can be thought as consisting of the following steps:

production → management → use

This is especially true for the Italian case because of the poor experience in the organization of GL.

At present, in Italy a catalogue of Degree Theses is about to be set up but a GL National Bibliography is still missing, meanwhile bibliographic standardization of Ph Doctorates is carried out.

2.2 *The interview target*

The qualified observers were selected from Italian special libraries, for their institutional position, the quality of their collections and for the high specialization of their users.

2.3 *The interview scheme*

We drew up an interview scheme containing a number of questions. Questions may be followed by sub-questions which can be asked or skipped according to the context.

Such a method gives us an "added value of information" with greater flexibility in this preliminary phase of the survey. In this way interview effectiveness and comparison among the respondents will be increased.

The interview scheme consists of three sections.

Section A contains 19 questions about "Issues connected with the recognition of GL documents". The initial questions concern the main problems of GL, first of all the very definition of GL. *Section B* contains 10 questions about the "GL management", whose answers are expected to provide information about the GL management in the library where the respondent works, basically about how GL documents are processed. *Section C* contains 10 questions about "Education and training", focused on past, current and (possibly) future projects of the library on GL education and training

The "tone" of several questions is intentionally generic and "confidential" in order to capture the experience of the respondent as much as possible.

Interview scheme

Section A) - Issues connected with the recognition of GL documents

1) What terms are employed in your Library for GL documents?

2) How are GL documents identified?

3) Do you agree with the following definition of GL?

"Grey literature is that which is not readily available through normal bookselling channels, and is therefore difficult to identify and obtain".

4) What changes to this definition do you suggest?

5) Do you think that GL documents have the same "tone" of grey?

6) How long have you been working in your Library?

7) How long have you been involved in GL?

- 8) How far back does history of GL in your library go?
- 9) In the last few years, have you observed an increasing or decreasing interest in GL?
- 10) Is there any resistance, cultural or operational, from your staff to GL documents?
- 11) Do you think GL workers have a "grey" place in the organization of your institution?
- 12) Is your institution a GL producer?
- 13) If (so) your institution is a GL producer, is its GL production intramural or extramural?
- 14) If (so) your institution is a GL producer, has it got an inhouse printing service?
- 15) Can you give a figure for the amount of GL documents managed by your library?
- 16) Can you give some examples of GL documents managed by your library?
- 17) Are there special GL documents, e.g. historic documents that need specific management?
- 18) Has the task of GL information processing required a change in the organizational structure of your library?

Section B) GL management

- 1) Are GL documents in your library either stacked or processed?
- 2) If in your library GL documents are processed, which of the following phases (if any) needs special attention?
 - selection and acquisition
 - cataloguing and indexing

- bibliographic control

- storing

3) Is the bibliographic treatment of GL documents separated from the bibliographic treatment of other documents?

4) Have you encountered difficulty identifying GL producers ?

5) A simple and easy access to "grey documentation" remains a central focus of concern. What is the role that the GL managers could play?

6) GL documents raise problems to users in terms of GL citation in bibliographic reference. What do you think GL managers should know?

7) In the last few years many efforts have been made to improve bibliographic descriptions in order to facilitate access to GL documents. Do you know the International standards ISO 10444 (ISRN)?

8) Do you think that the standard ISO 10444 could solve the problem we are talking about?

9) Are you familiar with GL databases?

10) Are you familiar with SIGLE? NTIS?

Section C) Education and training

1) Are there any education and training programmes in your library?

2) If so, does it resort to internal or external teachers?

- 3) Are there education and training programmes about GL in your library?
- 4) If so, what are their contents?
- 5) In your opinion what should be the educational background of a GL worker?
- 6) In your library what are the skill of the average GL-worker in your library?
- 7) In your opinion should there be a specific curriculum for GL-information specialists?
- 8) If so, should there be one general-purpose curriculum or different curricula taking into account different kinds of GL-documents?

Conclusions

It is the task of library authorities and their heads to assess needs, determine priorities and quantify resources required to organize GL in order to satisfy the users ensuring their information needs are met.

At present identifying grey information, which is often almost "investigative" or "detective" work needs the professional experience of the GL manager.

These considerations established the basic element of our present work (interview) in order to built up an educational and training model for GL information specialists.

After elaboration, the next step will be to draw up a further questionnaire for use with GL producers and GL users, including international experts who are involved in SIGLE and NTIS databases.

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GREY LITERATURE IN POLAND

There is no need to talk about definitions, or the history of „grey literature” at this gathering because everyone here is a specialist in this area and probably took part in previous conferences where these problems were discussed. My aim, then, is to talk at present, on third Conference, about „grey literature”, discussing it in the context of situation in Poland (1, 2, 3, 4, 5).

It is worth noting, at the start, that the definition of „grey literature” has been around at least since the 1920's, though in Poland the expression, „grey literature”, is not widespread and remains rather unknown. Of course, it appears as source of information and, depending on its type, is utilized to a greater or lesser degree. Several factors influence this, and I will address it later in my presentation.

Poland is a country in central Europe and until 1990, was tied, politically and economically, to the so-called Soviet bloc and this influenced its development and access to grey literature. There are about 1272 academic and scientific libraries, about 9 505 public libraries, about 1426 special libraries and about 312 centres of information. All of these locations are presumed to be collecting at least one type of grey literature. It is an enormous reservoir of information.

Types of Grey Literature appearing in Poland

Among the types of grey literature most frequently making its appearance in Poland are: patents, regulations, research findings, conference papers, government bulletins, bulletins published by various institutions, doctoral works, theses and dissertations, business publications, minutes of various committees and organizations, reports of experts, travel (official trips) information, translations, etc.

Characteristic of Poland is the „underground literature”. I assume it appears in all the countries which did not, and do not, have complete freedom of expression and publication. In Polish libraries, especially the academic, these ephemera consisting of: death notices, announcements, theatre programs, theatre posters and other materials, are specially collected as they give testimony to the cultural and social life of the time.

Patents

Description of patents as a source of information in Poland have a long tradition and do not exactly fit into the accepted definition of grey literature when they are published and information regarding them is universally accessible. The Patent Office of the Republic of Poland (Urząd Patentowy w Polsce- UP) publishes and describes patents. Home page WWW <http://saturn.ci.uw.edu.pl/up/> is set up bilingually, in English and in Polish. One can also use e-mail: urzzadpat@plearn.edu.pl. Collections of Polish and foreign patents are available in several centres in Poland. One of them is in a university, eight of them are technical institutes (universities), one in a military academy, three in industrial research and development institutes, and one in the so-called Technical Club. Among these institutions the Academy of Mining and Metallurgy (AGH) also called in English - Stanislaw Staszic' Technical

University Library in Cracow stands out because it has been handling information on patents for a long time, having besides foreign, a full description of Polish patents. Several other academic libraries, both special and professional, gather collections of patent descriptions in the areas in which it specializes. The Patent Office of the Republic of Poland installed patent data bases with remote use capability. The following are the data bases: INFPOL, INFPAT, MARPOL, MARMAD. Bibliographical data on Polish patents are available in the data base POLPAT. Data base INFPOL contains information on patents for inventions and protection rights for utility models granted in Poland as well as on published applications that have not yet been granted protection. Bibliographic data processed in the Patent Office of the Republic of Poland are the source of information for the INFPOL data base. INFPAT contains information on patent documents from 15 countries and from international organizations (BG, CH, CS, DD, DE, EP, FR, GB, HU, MN, RD, SU, US, VN, WO, and from the new patent offices documents with priority in one of the countries.

Information on international patents is delivered to the INFPAT data base through the European Patent Office from its branch in Vienna (EPIDOS - INPADOC). The base MARPOL contains information on verbal and figurative trademarks protected in Poland, filed under national law, and MARMAD contains verbal and figurative trademarks protected in Poland, filed under the Madrid Agreement.

There is also access to information on Polish patents through the ESPACE-ACCESS system (patent applications), ESPACE PRECES (full text). (There are patents from the Region of eastern and central European states on CD-ROM. The system has been in operation since 1993. The PRECES discs contain a reproduction of scanned patent documents of Bulgaria, the Czech Republic, Lithuania, Latvia, Poland, Romania, Slovakia and Hungary. One can obtain a laser printout. In ESPACE-PRECES one can also obtain a compendium of bibliographic descriptions of the patents in the system of patent as well as in certain cases, abstracts in the original languages together with an English translation. The disc ACCES-PRECES has an index of bibliographic data of all patented documents found on PRECES discs in the original language and in translation into English, and ESPACE-WORLD has patent applications, (full text). TRACES are publications registering trade marks of central and eastern EUROPE. Searches on this disc can be only through MS-WINDOWS.

Not every centre in Poland has a bibliographic data bases. Nonetheless, 6 centres have ESPACE Bulletin and 5 centres have ESPACE ACCESS. These 14 regional patent information centres operating in Poland have other data bases such as PATOS, COSMOS, USAPAT, Chemistry Citation Index, and others. It is not my intention to give a full listing or statistics on this topic, so may refer those who may be interested to Teresa Szymorowska's paper in English: „mediu@bu.uni.torun.pl.”

Standards

The Polish Standards Committee (Polski Komitet Normalizacyjny- PKN) sets industry standards in Poland. These standards are widely available in information centres both because they are offered for sale in designated, and authorized by PKN, academic bookstores or by the PKN Publisher. They can be found in the PKN „Catalog of Polish Standards” (Katalog norm polskich), which is only now putting together its WWW page on the Internet. In searching for standards one can use the data base POLINORM, containing descriptions of Polish national and trade standards, and also the STANDARDS INFODISC in which bibliographic data as well as national and international standards can be found.

Unpublished research reports, experts' reports

This type of document is primarily the product of universities and scientific educational research institutes. (In Poland these are institutions linked to specific ministries but more often, they are connected with industry). The data base SYNABA is organized by Information Processing Centre attached to the Committee for Scientific Research which, in Poland, distributes funds for scientific research. This system is the continuation of the data base of the 1970's. It was an international system for scientific research in countries belonging, at that time, to the Soviet bloc. After organizational changes in the area of information services in Poland and after the liquidation of the Central Institute of Scientific, Technical and Economic Information in Poland, it was decided to organize these information services at the Information Processing Centre. This centre carries out searches for users and prepares bibliographic lists.

Scholarly research information is recorded on CD-ROM. Registering this type of production is of unquestionable benefit to information users. Researchers, before doing their research, can check to see whether a similar question has already been researched elsewhere. However, there are long delays in recording data into the system, as authors of works and projects do not always remember to send in a description of their work. It also happens that information on a given work exists, but access to it is difficult. Authors, even when they knew that a registered piece of research was sought after by users, would refuse to send it on interlibrary loan or even make it accessible at their location. Firstly, this was because their works were unique, and secondly, because they had only one or two copies, or they were afraid to show their findings because they had not yet been published.

Habilitation works, doctoral dissertations, Master's theses and Licentiate Projects

The earliest mentioned Centre publishes a „Catalog of Doctoral and Habilitation Works” and is also on the electronic media of CD-ROM. In addition to the „Catalog” and its electronic equivalent, the data base, individual universities publish the bibliographic works of their faculty or they create bibliographic data bases most often supported by the MICRO/ISIS bundle of programs that was set up by UNESCO or using Polish program MAK. In general, they are not accessible on the network. In most of the universities the legalities of access type of material has yet been worked out. On instruction of the rectors (presidents) of universities, the unpublished dissertations are made accessible only on site at of the main Library's Reading Rooms. Each user has to sign his name and write the name of the institution with which he/she is connected. This is to protect intellectual property. But some universities do send even doctoral dissertations on interlibrary loan. Habilitation works in Poland are generally published by a given university, and, in those cases, access to them is relatively easy.

Access to master's theses and licentiates is not readily available. In many universities one can not have access to masters theses and licentiates without the permission of the thesis advisor. In others they are loaned at their location. Lately some universities tightened access to this type of research as there were cases of theft of the work itself or copies of large fragments of the work had been made.

Conference reports

The beginning of a system of gathering information on post-conference materials in Poland called SYMPO dates from 1984. For this they used a batch method and the large 3-rd generation computers. When the microcomputer era came into being, data bases were developed and created, and currently they are employed in about 30 Polish libraries. A data base contains mainly information on conference materials of conferences that took place after 1980. Retrospective data was not included. In the beginning the data base SYMPO registered only conference reports on technology, mathematics, and natural sciences, but later it was broadened to include social sciences such as sociology, psychology, and library studies and information science.

There is great demand for this type of information because the conference reports often contain the quality of something new. Usually this consists of either the summation of the direction research is going, or points to newly undertaken research. In the meantime, this information is difficult to come by. Most often the conferences participants keep the information in their private collections or in their own laboratories or offices, not turning it over to libraries, even though often the conference is paid for by the university or another institution. These materials, if they are published, would be difficult to obtain through the usual bookstore route. Thus, the initiative of the Warsaw Polytechnic in organizing SYMPO System is very valuable. However, there are conference materials outside of this system which are only copied and not published and access to them is very difficult.

Underground literature

During the Second World War, as well after it ended, when censorship was rampant and there was no political or economic freedom, leaflets and brochures, books and periodicals were disseminated, it was the so-called „secondary circulation”. It was smaller circulation. The so-called „underground” literature dating from World War II found its place in bibliographies published both in Poland and abroad. And the same thing happened with publications that came out underground during the regime of the so-called People's Poland (see selected examples in Notes). There are various categories of underground literature. Besides books, brochures, and periodicals prepared most often on a mimeograph, not printed, there are fliers, posters, collections of caricatures. These came usually to the National Library, to the Jagiellonian Library in Cracow, and to some academic and public libraries. There is no full representation of this literature. There is no single information system which would facilitate access to them. These items are appearing in some libraries and data bases, and are being created through the utilization of the MICRO/ISIS software packet.

Corporate literature

Corporate, or trade literature, is being collected primarily by university libraries as well as professional libraries, in centres of information used by industry, or in Technology Clubs. Individual libraries or information centers also collect corporate literature, such as catalogs of production, etc., which is part of the profile of a given company. Trade literature is characterized by quick aging and the lack of many elements which should serve to describe it. Often local data bases or card catalogs are created to facilitate searching according to product or name of firm.

Printed leaflets

This type of grey literature is researched as a source of information relating to culture and social life, giving testimony to the time on which these documents came into being. Among others, there are: death notices, theatre programs, art. posters, theatre posters etc. Collections of this type of social documents appear in both university and public libraries and such special libraries, such as theatre libraries. The manner of organizing this material varies, depending on the organizing principles of a given library. One encounters traditional card catalogs and local data bases as in the case of theater programs.

Conclusions

Generally, one can divide grey literature in Poland according to:

- a) field
- b) organization of information about given source.

Ad a) there are 3 types, generally:

- technology, mathematics, natural science (patents, industry standards, trade literature);
- social sciences (underground literature, leaflets);
- both, (scholarly educational research, research reports, habilitation works, doctoral dissertations, master's theses, licentiate projects.

Ad b) **Centralized systems:**

patents, standards, published conference reports, habilitation works, dissertations, etc

Decentralized systems:

undeground literature, masters theses, licentiate projects, etc..

The main problems in collecting, accessing, and utilization of grey literature in Poland are:

- 1) Grey literature is difficult to search, identify, and acquire;
- 2) There is no one method for processing different kinds of grey literature;
- 3) Potential users have no orientation as to which types of grey literature and where (in which libraries or centres) they can find it.

There is no well planned localization of patent centres i.e. in small towns, and i.e. in the North-East part of Poland; there is lack especially in new patent centres, of well prepared personnel; there is no compatible computer equipment available to network with the Patent Office in Poland for proper data distribution:

It is very difficult to find trade literature and unpublished conference papers because only a fraction of these products is registered in some data bases or files and there is a lack of information as to where it is. The language barrier stands in the way of international dissemination of information on grey literature.

With the exception of patents, industry standards, published conference reports and habilitation and doctoral works, other types of literature do not have an accepted countrwide standard bibliographic description nor a single centre of information on them.

Proposal for a syllabus

The Institute of Librarianship and Information Science in the Jagiellonian University at Cracow, Poland is planning to introduce a 15 -hour program on grey literature for students in the academic year 1998/1999.

The aim of the program is: to make students cognizant of the importance of grey literature as a source of information.

The idea is to have all information personnel understand the concept of grey literature as a coherent aggregate, in spite of its multiplicity of forms, its description, its availability, and the legal ramifications of its access.

Grey literature as an information source (2 hours)

Conception, definition, and meaning of grey literature;
undertaking of the different forms and types of grey literature in Poland and abroad

Methods of acquisition of grey literature (4 hours)

Finding available sources to form a collection of grey literature

Methods of processing grey literature (4 hours)

Searching for grey literature in traditional and electronic
sources and services (6 hours)

Grey literature and its Users (1 hour)

Needs of users
The localization of users of grey literature
in Poland from geographical point of view
(somehow they like to use different types)

It is imperative that one or two centres where grey literature is available be visited and assignment given to find specific types of grey literature, or a project to prepare a concise description of those documents that are covered by general bibliographic description on national or international scale.

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The neglected domain: Grey literature in education and training and the urgency for a European solution

Irmgard Lankenau / Heinz Bartel

Since ancient times, **travelling - or mobility** as it is referred to today - has been considered as a means of personal enrichment for the traveller and as a positive contribution both to the host society, which can derive much from this contact with a different outlook and specific abilities, and to the traveller's own environment, which benefits, when he or she returns, from the experience gained further afield. A German proverb reads „Wenn einer eine Reise tut, so kann er viel erzählen“ („strange things happen, when you are abroad“ or „if anybody does a lot of travelling he/she has much to tell about it“). These remarks reflect in a direct or indirect manner quite a number of aspects which are related to **education and information**:

- development of personality,
- self-discipline,
- intercultural contacts,
- communication in a foreign language,
- comparing your home environment with what you have seen somewhere,
- gaining experience and spreading information.

In the past all this mobility was mostly a matter of **individual ambitions and initiatives** and a question of status in society and of money. Information on travelling adventures was kept and passed in handwriting or in a printed form. Already at that time „grey literature“ played quite an important role, if we think of diaries, letters, messages etc. In their reports about other parts of the world travellers very often described patterns of traditional and institutional education in order to meet the natural curiosity of people to know more about educational matters in regions far away. But having a look „**beyond the edge of the plate**“ to see what neighbours are doing in the educational field has remained for quite a long time a concern of individuals and in educational sciences particularly a task of a few researchers in the field of comparative education.

In the first half of this century education and training had been local, **regional and national affairs**. In developing education systems each society has its own roots and traditions. Federal countries even face the difficult task to combine or to coordinate different structures and a diversity of educational developments of their states, regions or provinces. This includes manifold models of education

systems ranging from kindergarten to higher education, school curricula, educational acts, examination regulations and also vocational education and vocational training opportunities. In this context it becomes quite clear that education and training depend to a very large extent not only on traditions but also on regional and national languages.

Major agents in education and training like school teachers, education administrators and politicians as well as students only used to have a minor interest in becoming acquainted with foreign education systems and training procedures. It is amazing and characteristic that mainly **education statistics and educational indicators** have been of high interest because they are very useful tools for comparison. These figures and facts were highly welcome in order to convince superiors that in comparison to other countries your own conditions are worse than those of the others as far as resources, working time, income etc. were concerned. Further information on curricula, on political issues and on educational research has been rather neglected. This situation was also reflected in the respective field of **information and documentation**.

In contrast to science and technology there is no comprehensive international database on education and training. Even ERIC documentation remains a domain of anglophone countries like U.K., Australia, Canada.

In Europe there are some **national clearing houses** like PEPSY in Scandinavia, British Education Index in the U.K. and FIS Bildung in Germany. The latter includes all types of literature, i.e. journal articles, monographs and - as far as we succeed in receiving it - **GREY LITERATURE** published in Germany, Austria or Switzerland. Although the original language of most of the documents is German, we try - as far as possible - to translate titles, key words and abstracts into English.

As we have already emphasized, there has obviously never been an urgent necessity for the majority of citizens of a nation to get familiar with education systems of countries abroad. This **situation has tremendously changed** since we have the Single Market and take promotional measures and actions in favour of European integration, the transformation processes in Central and Eastern Europe and the increasing trends towards globalisation and international competition, particularly in the field of economy.

Nowadays it has become clear that education and training will become one of the main factors of competitiveness in a changing world undergoing a „**digital revolution**“. Therefore it is not purely by chance that political leaders like President Clinton with the educational program „Goals 2000“, and Prime Minister Blair, who presented the three main targets of his political programme: „Education, Education, Education“, are giving top priority to educational matters. The German Federal President Herzog in his speech held at the conference of the German Society of Educational Science in March 1996 pointed out: „Education

non-EU Member States in the integration process on the road to a so-called **European Educational Area** or European Educational Space, in particular by cooperating more closely with the Council of Europe (with about 40 Member States). In other words - we should not forget, that the European dimension of education also includes the **countries of Eastern and Central Europe**. A fact, which we have to bear in mind, if we speak about our ambitions and **difficulties with regard to the exploitation of grey literature** in Europe or even worldwide. As far as grey literature from the CEEC on education and training is concerned we have already lost ground. This statement results from our own cooperation efforts with Central and Eastern Europe and the unsuccessful results due to transitional problems and financial strains in these countries.

But there is a new development with **consequences for the production of grey literature on education and the dissemination of educational information** resulting from a new level of cooperation in the field of education between the PHARE-countries and the EU Member States. A Conference of Ministers of Education of the respective countries in April 1997 in Warsaw titled „Towards a Common European House of Education“ identified the following areas of future cooperation as being particularly important:

Quality, including

- basic education and eradication of illiteracy
- evaluation methods and benchmarking/transparency
- exchanges of experiences/best practice

Mobility, including

- the importance of removing obstacles to the free circulation of students and teachers, inside and outside the European programmes
- the improvement of the recognition of diplomas/competences

European dimension, including

- creating schoolpartnerships
- appropriate coordination of the European Educational programmes
- the teaching of languages/multilingualism
- environmental education

The Knowledge Based Society, including

- multimedia educational software to be produced on a European scale
- opening of the European Network for Schools to the countries of Central and Eastern Europe

Lifelong learning, including

- priority for teachers as knowledge transmitters
- new methods of learning

Teachers, including

- fostering the quality of initial and continuing training of teachers

New mechanisms for Cooperation

- for instance the possibility of groups of countries to be supported.

There is another challenge in view of the **utilization of printed grey literature**. The EU educational programme SOCRATES, which has integrated a variety of existing programmes and actions, contains new elements. An important innovation is **COMENIUS, which introduces European co-operation in school education** through its support for inter-school partnerships, teacher exchanges, and continuing teacher training. It is quite obvious that the growing mobility of primary school pupils and secondary school students will be accompanied by documentation activities in schools (profile descriptions, reports, project plans, evaluation papers etc.) in printed or electronic form and the exchange of information on experience and areas of interest. This will cause - in a positive sense - new „floods“ of grey literature only available to limited circles of persons. We gained already our own - not always encouraging - experience in collecting „grey literature“ produced in the **Europe Schools of German Bundesländer**.

It is just the right time that GreyNet takes initiatives maybe in cooperation with the European Commission and the Council of Europe to develop awareness among grey literature producers that information must be made available to all citizens and that ways and opportunities have to be found to compile all these sources. Really, a great challenge for GreyNet !!!

With regard to specific areas of education, e.g. to school education, the collection and dissemination of **electronic information in Europe** is developing quite fast, especially by means of the Internet. But this development has to be channeled - from our point of view - into a comprehensive solution regarding the field of educational information as the whole. Splitting the networks into small specific topics ends up in getting lost in the jungle of information. Even the **European Schoolnet initiative EUN** ought to find shelter under the great roof of education. The overall objective of the EUN is to establish a European school information network as a multimedia and communication platform as well as a framework for

- collaboration of schools in Europe,
- high-quality information services with a pedagogical content and representing a European added-value,
- co-operation at a European level among national education authorities, universities and industry to develop ICT in schools as regards content, pedagogical approaches and technology and
- professional development of teachers, in particular as regards the use of ICT in teaching and learning.

This is without doubt a promising initiative by EU Member States and EFTA countries in co-operation with the European Commission to contribute to the implementation of the **Acton Plan „Learning in the Information Society“ (1996)** mentioned before. But at a time when we have reached already the level of structures like „networks of networks“ we have to decide at this early stage what to structure and how within the framework of INFORMATION ON EDUCATION AND TRAINING.

In these last decades of the 20th century, the prodigious development of modes of transport and the spectacular progress in means of communication have meant that mobility is a fact of life in both work and leisure: conveyed by the media and satellites, knowledge now knows no frontiers; it is no longer compartmentalised but is evolving to encompass the whole planet.

These remarkable **impacts by modern telecommunication, information systems and multimedia products** have taken education and training from national levels to the international arena. It is even said, that the future society will be not changing itself into an information society but especially into a **knowledge-based society**.

What do these developments exactly mean for **education and training** as well as **information services** about it?

„Information and communication technologies have indicated a new industrial revolution worldwide which is comparable with the industrial revolutions in the past. This revolution opens enormous capacities for the human intelligence and will be the source for many changes in the way we will live and work together“.

This part of the so-called **Bangemann-Report** indicates the fundamental changes taken place in a society determined by development, dissemination and networking of information and communication technologies. The powerful dynamic of the technological development and the fast speed of innovation in all parts of life come together with shorter and shorter half-life periods of knowledge. In addition not only information but even knowledge will be available immediately online from any part of the world.

The world-wide availability of data, facts and information also creates **growing demands for:**

- Know-how on access to information
- Orientation in the labyrinth of knowledge
- Adequate selection of information
- Efficient use of information
- Systematic networking of new information with knowledge already existing.

These demands require respective **qualifications; competencies** that will become **key qualifications** in almost all fields of economy and society. They are often cited in the context of „lifelong learning“, a conception which is determining from now on our whole life. These developments create new challenges for education and training. Compared with developments in the last decades the change will take place faster.

Looking to future trends we **anticipate the following main developments:**

Decentralisation of education and training: We expect a boom of tele-learning. Today we have public and private education institutions and people have to attend classes and courses in the traditional way. This situation will be changing.

Education innovation by information technologies: Learning in virtual situations will play an import part especially in vocational training.

Education in open knowledge systems: Until now we are used to learn and to do research work according to disciplines. We are convinced that this will be changing: students, researchers and other target groups of interest will have the chance to be taught in an interdisciplinary manner.

New learning environments: We anticipate that learning and teaching will not only take place in classrooms with periods of 45 or 60 minutes but more and more in various settings and time periods.

Self-organised learning: It will be possible to create one's own schedule by choosing the modules one is interested in. Teaching will become even more competitive as soon as teachers and professors and also private education firms will offer their modules via Internet.

It is necessary to think about these developments to make clear that education really becomes **the** social top issue of the 21th century. In order to take part in these developments the time is ripe to reflect precisely on the **availability of information on education and training**.

Looking at these developments we have to recall our position in making information on education and training available. The first question of course is: **what information do the different customer groups need?**

For instance:

Politicians need information to make decisions in an environment where schools and universities become more autonomous and self-determining, for instance:

- Comparative material on education systems
- Information on national education acts
- Factual information on statistics and on education indicators
- Information on current trends and discussions
- Information on pilot projects, succesful innovations, use of computers and telecommunication in education and training

Education administrators as chancellors, rectors, head teachers etc. need:

- Facts and figures on mobility, exchange possibilities, projects
- Information on recognition of examination certificates in various countries
- Information on quality measurement and evaluation of schools

Researchers need information on:

- Calls for tenders
- Information on current research projects
- Research reports
- Publications

Teachers need:

- Curricula information
- News on exchange, mobility, multimedia courses
- Information on multicultural education
- Information on possibilities of in-service training
- Know-how on tele-teaching and instruction

School Students need information on

- Networks for their respective subjects
- Language courses
- Exchange possibilities
- Learnsoftware
- Tele-learning

University students need information on:

- University courses and access, tuition fees
- How to register at universities
- Grant possibilities
- Exchange programmes
- Job opportunities

Industry needs information on:

- Education processes especially in vocational training
- Qualification requirements regarding employees in education
- Investment proposals for continuing training of staff
- Language skills for international communication
- Further training in general.

For all these target groups it is necessary to make information available on publications, decisions, programmes and further activities of UNESCO, OECD and EU.

We hope it became clear that there is a need to **reflect carefully on a better international availability of information on education and training**. Our proposals include the following types of information and make no difference whether they are made available on paper, CD-ROM, Online or on a WWW-site:

- 1. National and international calls for tender**
- 2. Research Projects**
- 3. Grey literature**
- 4. Monographs and journal articles**
- 5. Internet resources**

1. National and international calls for tender:

As far as the EU is concerned information on calls for tender are available through the distribution channels of CORDIS. National calls are more difficult to find. For instance in Germany the web-site of funding organisations can be searched. Some universities try to combine the calls and programmes of the different funding organisations. It would be of interest to link those sites internationally. Although one is not entitled to make an offer it is nevertheless of high interest to learn what is going on in other countries.

2. Research projects:

It is our recommendation to call upon the responsible persons to make a decision to include research projects in education also in the activities of DG XIII of the European Commission. CRIS - the current research information system - will hopefully offer an opportunity for implementation.

In some countries national activities regarding this are already carried out. In Germany for instance IZ Sozialwissenschaften collects the data regularly and in UK CRIB - Current Research in Britain also informs about the projects in education.

Information on current research projects is extremely important in order to avoid double work in research.

3. Grey literature:

Grey literature in education is still a remarkable part of all information published in this field. Especially curriculum information, national discussions and also conference proceedings as well as publications on workshops and special projects are still published „grey“. Therefore our proposal is to invite the national information centers on education to pass their grey literature via the respective national centers to SIGLE too. From our point of view education and training will become a major cross-section-area for all fields of science and technology. The further development in a globalised and therefore shrinking world depends highly on the standards of education.

From our point of view in Germany we are working on this question and I hope we will find a solution next year.

4. Monographs and journal articles

As already mentioned above, the national databases on education are really „national“. We have to think about a „virtual“ European database or what we would prefer a European network of information centers in education which already has been discussed in the framework of EERA, the European Educational Research Association.

5. Internet resources

There are many initiatives to organize Internet resources in education. From our point of view unfortunately most of them are very individualistic and do not refer to international needs and standards. However, there are also some initiatives like the German Education Server at Humboldt University in Berlin trying to cluster related information. It is also necessary to connect these initiatives with SIGLE and CRIS in order to support these systems in collecting also electronic material.

We would like to praise the European Commission for its initiatives SIGLE and CRIS and for its support regarding EURYDICE. Together with the Member States a lot has been invested already in this joint information tool on education especially for governmental interests. We propose to connect EURYDICE closer with the national information centers and the national education networks and of course with SIGLE and CRIS.

We would appreciate it very much if the Commission organized a meeting for all suppliers of information on education in order to create a European network on information on education including SIGLE and CRIS. The spider in the network of course will be EURYDICE.

Let us close expressing our hope that education and training will not only be seen as an investment into future but also as a dynamic potential for the protection and improvement of the individual and public existence today and in the future. Therefore we would like to encourage all of you to invest in sustainable efforts to give education and training also in the field of information and documentation the place it is worth for.

**Teaching and Exposing Grey Literature:
What the Information Profession Needs to Know:
Examples from the sciences**

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ABSTRACT

Grey literature takes on new meanings as publishers and individuals create new products and release information in different ways. With several choices of access and delivery usually available in different formats, the difficulty once associated with publishing grey literature and the enormous expenses predicted for a relatively low volume, electronic publishing via html and pdf/adobe acrobat options, has created new models and opportunities, in an almost magical way. Information access in the global economy forces the information professional to be better aware of a wider spectrum of information, including traditional grey literature. As the hues change, the literature takes on a new sense of value. This paper explores different examples of scientific grey literature and suggests how it can be introduced to and by information specialists and how better training and exposure can reduce the obstacles in utilizing it more widely. By concentrating on new modes of publishing and delivery, the capabilities of information professionals are reinforced and grey literature in the sciences gains a more prominent role in a range of information use, access and dissemination activities.

I am very grateful that Marjorie Bloss from the Center for Research Libraries in Chicago has agreed to read my paper.¹ I wanted to share some of my current thoughts and ideas with you about changing themes in scientific grey literature and how the education process has evolved to place grey literature more in the mainstream of scholarly communication in the sciences. I remain very disappointed that I can not be among you to hear the latest trends in the grey literature movement. The early conferences have each promoted grey literature to a new standard and acceptance, and we can expect nothing else from the papers and discussion at this conference.

EVOLUTION OF GREY LITERATURE

The definition of grey literature has changed rather drastically since the First International Conference held in Amsterdam four years ago. That was at the beginning stages of the web as the primary vehicle of electronic publishing. Four years has rarely been compared to a generation in any other medium besides in electronic publishing. When one thinks for how many centuries we depended upon print, one is truly overwhelmed by the contribution of the computer chip. This forces one to realize that technology is never at a standstill and that the web remains at a frontier stage, more embryonic than developmental. Its infancy forces us to realize that web publishing will continue to evolve into an even more sophisticated function and that the concept of digital libraries will not easily be defined as either a unifying or

¹ The author acknowledges with much appreciation the thoughtful editorial comments made by the reader in preparing these proceedings.

distributing force for a long while.ⁱ Michael Lesk, who posed such a dilemma in a paper delivered in Spring 1997, introduces several future trends that a strong consensus supports.

They include :

- ❖ widespread availability of computers for all college and university students and faculty;
- ❖ general substitution of electronic for paper information;
- ❖ library purchase of access to scholarly publications, rather than physical copies of them.ⁱⁱ

Many recent studies have focused on the economic models of electronic publishing, and by extension, the implications for scholarly communication and the professional development necessary for the information industry. Education and training are key elements in ensuring success among all parties involved in the publishing enterprise: the author/editor/compiler (intellectual creator); the publisher (scholarly society, commercial or independent); the publishers' service bureaus; secondary service providers/publishers; the agents, vendors and suppliers; the increasingly visible aggregators; the librarians; and finally the readers or users.

ELECTRONIC PUBLISHING IN THE SCIENCES

Scientific publishing poses different challenges and the examples of my current exploration indicate some unique attributes and trends. Scholarly communication in the sciences holds at its cornerstone the tenets of publishing quickly the results of scientific inquiry or findings, and distributing the results of research expeditiously to the academic and industrial communities. To accomplish this in print dictated skyrocketing prices for information for which there was still significant delays.

Electronic publishing has promoted developments in new modes of grey literature in the form of preprint services and technical report literatureⁱⁱⁱ distributed and shared via e-mail lists and institutional websites. Outcomes of such examples include a rethinking of the value of published works, the lifespan of interest, and the role of libraries to protect the archival function. Other attributes include: the ability to describe phenomena with methods other than textually; by incorporating multiple datasets utilizing graphs, tables, photos, illustrations, 3-D images, maps, spatial imagery, sound and cinema clips; opportunities for manipulation under different conditions; and incorporating materials from previously cited or published sources.

Educating one about grey literature begins with librarians and scholars in their exploration of different kinds of literature. The universe of information is composed of limitless sources of materials, which librarians have spent decades organizing. This classification process has segregated information into mainstream and grey literature, which has been described by a variety of academics and librarians. However, libraries tend to consider the "special collections" as those which require out of the ordinary treatment and care; and in today's practices where materials are increasingly processed by an outsourcing agency or by the supplying vendor, it is the grey literature that has gained a new visibility.

other laboratory environments. The United States Agricultural Research Service and its Animal Welfare Information Center at the National Agricultural Library and various Centers for Alternatives to Animal Testing have promoted an entire culture to respond to the new definitions of the word 'Alternative' in the context of animal use in research, testing and education. "Alternative" refers to methods, models and approaches that result in the "reduction" of the number of animals required, that incorporate "refinements" of procedures which result in the lessening of pain or distress to animals, or that provide for the "replacement" of animals with nonwhite animal systems or the replacement of one animal species with another, particularly if the substituted species is nonmammalian or invertebrate.^{ix} This definition of alternative has evolved from the concept of reduction, refinement and replacement (3 -Rs) of animal use originally proposed by Russell and Burch in 1968.^x What constitutes this as grey literature is that it brings together for the principal investigator, the legislation, bibliographic databases, laboratory manuals, physical resources, subject specialists, and each literature search required to support the animal alternatives is unique creating an "Improved Research Protocol."^{xi}

4 ❖ **SCIENTIFIC JOURNALISM** - There are numerous solid, clever and informative examples of how a well-established and respected journal has created new options for itself and inaugurated a new online version, richer in niche information, more current and avoiding the rigors of traditional scientific publishing. One of the more interesting examples of this type is *Science's*, Next Wave.^{xii} The wide scope of coverage includes information on sources of funding for scientists in training, features by the gurus in electronic publishing, career options for graduating scientists, and other useful information which would not have always been predictable coming from the American Association for the Advancement of Science (AAAS). This new format and extension of other print and electronic products show great promise in meeting needs of the members of this society.

5 ❖ **IMAGE DIRECTORY^{xiii}** - On October 7, 1997, Academic Press, following on their successful introduction of Project IDEAL (the Academic Press Online Journal Library, with the entire list of 175 journals available online to subscribers) announced in a press conference the launch of the Image Directory, reported to be the world's first online catalog of images. It is basically a new reference work in an interactive format.

Beginning with more than 100,000 records to date, this one-of-a-kind database of information on visual images is from collections worldwide, and supports the close professional collection between librarians and museum staffs.^{xiv} It must be remembered that this product is not intended to supply images, but only access to images. It is supposed to be equivalent to the "Books in Print" of images, linking to the holding institutions so that the user can be directed to the institution from which you can buy or license the image and seek additional information.

Again, the "greyness" of this product is defined by its multidisciplinary content since it spans the full spectrum of the arts, including painting, sculpture, architecture, textiles, photography, old master prints, ethnographic and iconographic objects, decorative

arts, toys, tools, religious artifacts, lithographs, posters, furniture and furnishings, portfolios, jewelry, maps and more. For the study of religious practices, art history, anthropology, theatre, geography, planning & design, architecture, and numerous other disciplines, this is a marvelously innovative tool. It brings to the user the collections from archives, museums, galleries, dealers, which may not be possible to visit or catalogs which may not be available to browse.

Users can search for images by artist, title, subject, medium, style, material, museum, collection, location, nationality or keyword access across multiple options and platforms. Each record contains data on the work, rights and reproduction information, licensing fees and a link to the image provider's web site. This extends the concept of indexing from one tool to many external sources. Consider how a physical or cultural anthropologist wants to study why a particular remote tribe wears a standard head-dress for certain celebrations. Natural history museums, art museums, and national cultural institutions may have such examples of the head-dress in their collections and it could be retrieved and linked to the holding collection, directing the user to additional information. Such a resource has unlimited potential for its "amalgamation of material from widely divergent sources, making it a single source of authoritative information."^{xv} What makes this resource so interesting to librarians is that from the vantage of intellectual property, the image providers retain complete control of their images and information. As a reference source, it promotes valuable but perhaps unknown images to a far wider audience and informs users via links about related information sources, such as publications and exhibit catalogs, criticism and commentary, and key contact information. It is clearly a model of an electronic reference work which is not available in any other format. Why Academic Press wants to issue this in a print form as well remains a mystery.

OUTCOMES FROM GREY LITERATURE

Additional byproducts of each of these examples demonstrates how information is being shared globally. Distance education certainly has great success in reaching students at remote locations with access to materials once only found in major libraries; professional meetings and conferences can share the information exchanged there almost instantaneously, eliminating the curiosity of those unable to attend in person; additional opinion can be consulted from world's experts with fewer time delays; and the potential rifts that divide the rich from the less-endowed, is made up by simpler technology and better access. Granted, legal issues remain unsolved and complex, technology costs great sums, but the new language of the web is more universal than anything else today. Messages can be communicated in different languages, time beats to only one clock, and access, however tricky can be negotiated for appropriate sums.

In conclusion, there are some very creative opportunities for the information professional to become better informed about and familiar with grey literature in an electronic age. There is no easy answer concerning what one needs to know or how he or she will learn it, but this paper suggests reasons why this knowledge-base is critical and how increasingly important grey literature is becoming. As Albert Henderson

editorializes, "Considerable confusion obscures the line that separates the grey from the other literature, particularly when it comes to the notion of "being published" in the sense of a formal communication that has been validated by peer review and invested with independent economic resources."^{vi} The sciences have certainly made things very exciting and grey literature will continue to support it widely.

ⁱ Michael Lesk, "Digital Libraries: A Unifying or Distributing Force?" Paper presented at the Scholarly Communication and Technology Conference, Emory University, Atlanta, GA, April 24, 1997. see <http://www.arl.org/scomm/scat/lesk.html>

ⁱⁱ *ibid.*

ⁱⁱⁱ P.A. Kreitz, L. Addis, H. Galic, and T. Johnson, "The Virtual Library in Action," *Publishing Research Quarterly*, Vol. 13, #2, Summer 1997, pp. 24-32.

^{iv} Jeremy Hope and Tony Hope, *Competing in the Third Wave: The Ten Key Management Issues of the Information Age*. Boston, MA: Harvard Business School Press, 1997, p. 68.

^v *ibid.*

^{vi} Jerry Campbell, "Rethinking Boundaries: Government Documents in an Integrated Information Environment." *Documents to the People*, vol. 24, March 1996, pp. 63-66.

^{vii} see http://www.house.gov/science/science_policy_study.htm for example of Science Policy Reform and Libraries

^{viii} William Stokes, and D'Anna J.B. Jensen, "Guidelines for Institutional Animal Care and Use Committees: Consideration of Alternatives," *Contemporary Topics*, vol. 34, #3, May 1995, p. 51.

^{ix} National Research Council, *Use of Laboratory Animals in Biomedical and Behavioral Research*. Washington, DC: National Academy Press, 1988.

^x W.M.S. Russell and R.L. Burch, *The Principles of Humane Experimental Technique: Special Edition*, Universities Federation for Animal Welfare, Herts, England, 1992.

^{xi} David C. Anderson, "The Pursuit of Better Science: A Personal View of the Search for Alternatives," *Animal Alternatives, Welfare and Ethics*, vol. , 1997., p. 517.

^{xii} see <http://www.nextwave.org/index.htm>

^{xiii} see <http://www.imagedir.com>

^{xiv} Julia Gelfand and Ben Booth, "Scholarly Communication in the Sciences: Managing Challenges for Libraries and Museums," *Proceedings of the 15th Biennial IATUL Conference: Technological University Libraries in the Nineties*, vol. 3. Helsinki: Helsinki University Library & IATUL, 1994, pp. 9-30.

^{xv} Press Release from Academic Press, New York, NY, October 7, 1997.

^{xvi} Albert Henderson, "Grey Literature and Publishing Research," *Publishing Research Quarterly*, vol. 13, #2, Summer 1997, p. 3.

The Management of Grey Literature as a Component of a Library and Information Science Curriculum

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ABSTRACT

A Citation analysis of a sample of publications appearing in journals published in Africa was carried out. The citations covered major disciplines in the sciences, humanities, education, agriculture, management, social sciences and librarianship. The study reveals that grey literature is used by researchers across the disciplines with humanities accounting for the highest proportion of grey literature cited (63.3%) and sciences the lowest (23.8%). Given the importance of grey literature to researchers in Africa, as well as the pervasive role of internet in providing access to grey literature, a case is made for teaching the "management of grey literature" in library and information science schools in Africa. The paper provides a course content that includes an overview of grey literature, producers of grey literature, organisation of grey literature, creation of web sites and internet etc.

1.0 Introduction

The last two conferences have dealt in depth with what constitutes grey literature and how its exploitation can be promoted. The theme this year which deals with the design and transfer of scientific and technical information constitutes another stage of the continuum on the importance of grey literature. To us in Africa, the importance of grey literature cannot be over emphasised given the fact that the majority of the publications that emanated from the region are grey literature. According to Balabkins (1984) the majority of research materials in Africa appear in the form of grey literature. In other words, measuring the literary output of Africa without including grey literature will not provide the true picture of the situation.

If indeed grey literature is the major medium for disseminating the literary output, then a lot more emphasis need to be placed on the transfer of information contained in grey literature, thus the theme of this conference is very timely for those of us in Africa. This is because unlike the white literature, it is not well organised in most libraries and documentation centres in Africa. Bibliographic control of this literature is very limited. According to Aina (1995), books seem to

be the most important information carrier among the literates as most libraries including public libraries stock mainly books. The neglect of grey literature can be attributed in part, to the low priority accorded to it in the curricula of most library schools in Africa.

In fact in courses such as collection development, cataloguing and classification, very little mention is made of grey literature, rather, most emphasis is placed on books and serials. Advocating for its inclusion in the curriculum, however must be based on an empirical study showing its substantial use by patrons of library and information services.

The categories of patrons of libraries and documentation centres are many and varied but researchers constitute an important category of library and information services users. Without efficient libraries and information centres, researchers cannot perform their duties adequately. To them, libraries and documentation centres are sine qua non to their efficient performance. Thus a study of researchers ascertaining their use pattern of grey literature will provide an adequate base for judging its utilization.

The main objectives of this study are to find out the pattern of use of grey literature by researchers in Africa vis -a - vis white literature and secondly to establish if there is a need for incorporating grey literature into the curriculum of library and information science schools in Africa.

2.0 Methodology

There are a variety of ways for studying the use pattern of grey literature by researchers in Africa. One way of carrying out the study is to survey researchers, using questionnaire and interview as survey instruments for collecting the data. This will involve seeking their opinions on the frequency of use of grey literature compared with the white literature.

Another alternative is to compile a comprehensive bibliography of the writings of researchers in Africa and then analyse it bibliometrically to find out the proportion of what constitutes grey literature vis-a-vis white literature. This assumes that the use of grey literature as a medium for publication presupposes use. A more direct way, however, is to employ the technique of citation analysis in which the citations that appear in the publications of researchers in Africa will be analysed. The assumption here is that any publication cited presupposes use. Thus the proportion of grey literature cited by researchers will constitute a base that can be used in judging the use pattern of grey literature. This is the method adopted for

this study. Di Cesare and Sala (1996) used this method in their study of the use of grey literature in the agricultural economics field.

In carrying out this study, a sample of journals published in Africa were used as source journals. This is because journals in Africa constitute the major medium for disseminating research findings. Certain criteria were listed to enable a journal justify its selection. These are :

- (a) the journal must have a continental coverage. Its scope must not be limited to a country or a sub region in Africa.
- (b) the journal selected must be based in Africa, that is, it must not be published outside the continent.
- (c) it must be a refereed journal.

On the basis of these criteria, the following ten source journals were selected. The citations were taken from the latest issue

1. African Crop Science Journal. Kampala, Uganda - 4 (4) 1996.
2. African Development. Dakar, Senegal - 22 (1) 1997.
3. African Environment. Dakar, Senegal - 10 (1-2) 1996.
4. The African Journal of Finance and Management. Arusha, Tanzania. - 5 (2) 1997.
5. African Journal of Library, Archives and Information Science. Ibadan, Nigeria- 7 (2) 1997.
6. African Journal of Physical, Health Education, Recreation and Dance. Ibadan, Nigeria.- 3 (2) 1997. (AJPHERD)
7. African Journal of Science and Technology (A & B) Nairobi, Kenya. - A 9 (2) 1991 B - 5 (2) 1991.
8. The Journal of African Association for Literacy of Adult Education. Gaborone, Botswana- 10 (1) 1996. (JAALAE)

9. Journal of Social Development in Africa. Harare, Zimbabwe - 12 (1) 1997. (JSDA)

10. Trans African Journal of History. Nairobi, Kenya - 23, 1994. (TAJH)

These are the leading journals in the continent in the various disciplines. They are very regular except the *African Journal of Science and Technology* and *Trans African Journal of History*.

A citation is considered as a grey publication if it is a report (annual reports, technical reports, government documents, manuscripts etc), theses and dissertations, conference proceedings and seminar papers.

3.0 Results and Discussions

The ten source journals yielded 81 articles and 1558 citations giving an average of 19.23 citations per article.

Table 1 shows the distribution of the articles per citation for each field. Table 1 shows that social sciences, agriculture and humanities have more than 20 citations per article. Librarianship and education have the least numbers of citations per article. Table 2 shows that reports constitute the highest proportion of publications cited, followed by journals (30.4%). Overall, grey literature (47.4%) constitutes about half of all the publications cited.

Table 1: Distribution of articles and ciattions accross disciplines

Discipline	Journal	No. of articles	No. of citations	Citations per article
Education	JALAAE	5	73	14.6
	AJPHRD	7	80	11.4
		12	153	12.75
Social Sciences	AE	4	69	17.25
	AD	7	304	43.42
	JSDA	4	98	14.00
		18	471	26.16
Agriculture	ACSJ	11	260	23.6
Sciences	AJST (A)	7	60	8.6
	AJST (B)	7	108	15.43
		14	168	17.12
Librarianship	AJLAIS	8	98	12.25
Management	AJFM	9	168	18.67
Humanities	TAJH	9	240	26.67
TOTAL		81	1558	19.23

As presented in Table 3, grey literature is very popular among researchers in all the disciplines as it constitutes more than 63.3 % in humanities and 59.2 % in library/information science. The discipline with the least proportion of grey literature cited, is science (23.8%) followed by agriculture (31.5 %). The average number of grey literature citations per article is the least in the sciences (2.85) and highest in humanities (16.88). The average number of grey literature citations per article for all the disciplines considered for this study is 9.12 which is an indication that grey literature is frequently consulted by researchers across the disciplines.

Table 2: Distribution of citations by format

Form	Educ.	Soc. Sci.	Sci.	Agric	Libr.	Mgt.	Hum.	Total	%
Book	37	98	50	27	9	42	61	324	20.8
Journ	51	91	78	151	21	61	20	473	30.4
News paper	1	2	-	-	10	2	7	22	1.4
WL	89	191	128	178	40	105	88	819	52.6
Repts	54	270	21	53	48	62	145	653	41.9
Thes.	-	6	15	8	2	-	6	37	2.4
Proc.	10	4	4	21	8	1	1	49	3.1
GL	64	280	40	82	58	3	152	739	47.4
TOT.	153	471	168	260	98	168	240	1558	100.0

WL = White Literature

GL = Grey Literature

Table 3: Frequency of use of Grey Literature and average citation of Grey Literature per article

Discipline s	No. of articles	No. of citations	No. of GL	% of GL	Average No. of GL per article
Education	12	153	64	41.8	5.33
Soc. Sci.	18	471	280	38.2	15.55
Agric.	11	260	82	31.5	7.45
Science	14	168	40	23.8	2.85
Library/inf	8	98	58	59.2	7.25
Managt.	9	168	63	37.5	7.00
Humnities	9	240	152	63.3	16.88
Total	81	1558	739	47.4	9.12

From the findings, there is a justification for librarians/ information specialists in Africa to treat grey literature publications in the same way as books, serials etc hence the need to ensure that library/information science schools in Africa incorporate the "management of grey literature" in their curricula. The advent of electronic communications with features such as e-mail, listservs and internet services has made it easy for producers to transfer information contained in grey literature world wide. If such publications are produced electronically it will be easy to disseminate the information contained in the publications to those who need them. It is expected that producers of grey literature will ensure that they create web sites to enable researchers gain access to their publications. According to Ojo- Igbinoba (1997) information providers on the Internet can be at three levels : a) national in which various governments in Africa can provide information about their countries on the internet b) libraries and information centres in a country can form a consortium to provide information and c) faculties or a group of disciplines in the various universities can provide the Internet, their various publications. This is particularly significant given the fact that a large number of grey literature publications emanate from the universities.

The Malawian constitution was made available world wide to all Malawi nationals through the internet for their comments. Similarly the Government of South Africa generally provides its constitution, statistics, press information and cabinet papers on the internet. Thus producers of grey literature must be encouraged to ensure that their publications are available on the world wide web.

4.0 Grey Literature in the Curriculum

Curriculum has been described as a statement of programme of courses of teaching and instruction. Most library and information science schools already have curricula in place. But it is well known that curriculum is not static. Thus the paper is suggesting that whenever a library school decides to effect changes in its curriculum it is imperative to make management of grey literature among the courses to be taught. Such a course will involve teaching the following:

An overview of grey literature, producers of grey literature, organisation of grey literature, basics of information technology and communication technology, desktop publishing and creation of web sites on the internet.

5.0 Conclusion

This study is a further proof of the extensive use of grey literature by researchers in Africa. These publications, therefore should be made widely available to researchers since information contained in these publications may never appear in any other format. Librarians/ information specialists will play a leading role in making this possible. The first step is for library and information science schools in the continent to make it an important component of their curricula. It is hoped that this will ensure that library and information science school trainees will appreciate the importance of grey literature, thereby giving it more emphasis than what obtains now in libraries and documentation centres throughout Africa.

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GREY LITERATURE VARIETIES - DEFINITIONAL PROBLEMS

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Abstract

Grey Literature is usually defined as "Non Conventional Literature". Oxford English Dictionary and the Encyclopedia of Library and Information Science have yet to define it categorically. A wide range of documents are covered under this term. It is necessary to establish clear forms of grey literature. An attempt has been made to identify different varieties of grey literature and their relevance to knowledge. The methodology includes review of literature in the Grey Literature area followed by discussion on the prominent characteristics of the same. Generic Design Science Approach is suggested to define Grey Literature. Work in this field is expected to provide framework for systematic research in Grey Literature.

1. INTRODUCTION

Use of colour codes to identify literature is an accepted practice. There are blue prints of engineering drawings and architect's plans. The advertisements that are printed in telephone directory for products and services are called yellow pages. The official government documents are known as White Papers. Auger (1) has identified use of different colours in different countries. In the United States, the word Blue Book is used to denote various official publications, especially the state manuals which give biographical and other details about government employees. In France, the colours are yellow and white. In Germany, the government documents are white while in Italy, it is green and in Belgium, it is grey. However, when we talk of grey literature, it has little to do with colour but more to do with its form of presentation and subject content. Different categories of material are

covered by the concept of Grey Literature. Moreover, they are in different sizes, formats and in almost all subjects. This very peculiar nature of the documents make them stand between black and white as belonging to the 'Grey' Literature' varieties.

2. SELECT DEFINITIONS

A few attempts have been made to define Grey Literature, but so far it is yet to find its place for official definition in "Oxford English Dictionary", "Encyclopedia of Library and Information Science" and its Supplementary Volumes and "A.L.A. Encyclopedia" 3rd edition. "Harrod's Librarians Glossary" 8th edition (1995) has defined it as "Semi Published Materials". The word "Grey" or "Grey area" explained by three well known Oxford publications, however can convey to some extent, the meaning of "Grey Literature" as is generally understood by us .

1. The Oxford English Dictionary (2) - 2nd edition, Volume VI 1989, has given different meanings of the word 'Grey' in different context. Twin words like 'Grey friar' (P.830), 'Grey goose' (P.830), 'Grey hound', 'Grey lag goose' (P.831) have been explained but not 'Grey literature'. However the meaning of the word 'grey' as given in O.E.D., which could be a near match to 'grey literature' is as under -

"Used in various collocations in the place of black to indicate a less extreme form of the activity, object etc." (P.827)

2. The Oxford Encyclopedic English Dictionary (3) - (Single Volume), 1991.

Among other meanings, it explains 'grey' as

Grey :- Anonymous, nondescript, **undefinable**

Grey area :- A situation or topic sharing features of more than one category and not clearly attributable to any one category. (P.622)

3. Oxford Advanced Learner's Encyclopedic Dictionary (4) - (Single Volume), 1992.

Grey area :- aspect, topic etc. that does not fit into a particular category, and is therefore difficult to deal with.

Satyanarayana (5) compares grey literature with the Sanskrit term 'A Suryam Pasya'. Where A = No, Suryam = Sun, Pasya = Touch, meaning literature that is not coming into lime light.

The Encyclopedia of Information and Library Science (6) published by Routledge in 1997 has defined Grey Literature as "Publications which are not available through normal bookselling channels" and has stated further that organizations working with these documents prefer to give not a definition but a general description (P.156). But this is similar to what Auger (7) or Wood (8) have said in the Aslib conference in 1982.

3. REVIEW OF LITERATURE

The term 'Grey Literature' is said to have been coined first time in York city in 1978 in a seminar organised by the EEC in co-operation with the British Library. The review of literature done by the present author through two well known secondary sources, "Library and Information Science Abstracts" published by Bowker and Sour - U.K. and "Library Literature", an indexing periodical published by H.W.Wilson - U.S.A. reveals that various alternative terms have been used to cover the literature on "Grey Literature" by these secondary sources and terms have also been used interchangeably. The publishers perhaps do not want to miss the wide array of documents and key sources on "Non Conventional Literature". For example, Library Literature has used terms like -

Grey Literature - see Ephemeral materials

Ephemeral materials - see also

Pamphlets

Underground literature

Vertical files

Underground literature - see also

Small Press

Small Presses - see also

Self publishing

Underground literature

Evans (9) in GL'95 stated that the term is expanded to include the broad category of ephemera because according to Library of Congress subject headings, works such as reports, theses, conference papers, translations and limited circulation government documents are all subject terms for grey literature, with printed ephemera being the broader term. Di Cesare and Sala (10) have categorised the various types of Grey Literature as Light Grey, Medium Grey and Dark Grey according to their estimated availability and accessibility. Quantitative analysis indicates that 'Library and Information Science Abstracts' from 1969 to April 1997 (the latest available at the time of writing this paper) has published 171,000 + abstracts, out of which only 198 abstracts (0.11 %) represent grey literature. Out of those 198 abstracts, 57 abstracts are in languages other than English language. Descriptors used for abstracting are as varied as commercial catalogs and exhibits, working papers, pre-prints, grey literature, on-line databases, library materials, local government publications, legal deposits and so on, for as varied topics as physics, health care, geology, electronic networking, publishing, internet etc. One abstract is on the topic "Medical and Psychological effects - search through grey literature". The information disseminated through the Internet is not covered by the present paper. This discussion reflects the fact that 'Grey Literature' is still an undefined and uncertain form of literature.

4. NATURE OF GREY LITERATURE

Amongst other characteristics, Grey literature is said to be -

- Non Conventional, fugitive in nature
- Not available through normal bookselling channels
- Has poor bibliographic control

Reports, dissertations, translations and conference proceedings are known varieties of grey literature. However, 'Reports' is a generic term and not all types of reports are made known publicly. Allison (11) states that this literature is called 'grey' because it eludes easy definition. Every field has some varieties of grey literature. This view is also supported by Alberani (12). In the Performing arts - there are written manuscripts, screenplays, musical scores - all have fugitive element. Exhibit catalogs, maps, product promotion brochures, architect's plans - these may qualify for the same. But are these varieties categorized as grey literature varieties? There are letters, diaries, personal correspondence, paintings, picture post cards, numismatic collections, calendars etc. which form part of collection of libraries. Going by above parameters; they are non-conventional in nature, not available through normal book selling channels with no bibliographic control. All these varieties have historical and research value. The problem is where do we draw the line between mainstream publications, ephemeral literature, alternative literature and grey literature? What is understood by grey literature is that literature generated by disciplines or institutions for specific purpose and does not have a large audience beyond its own world.

5. DIVERSITY OF GREY LITERATURE

Generation of ideas and their manifestation is seen in numerous forms and they vary with the field. At an idea plane thoughts are generated at different levels and through different channels, such as shown in figure 1.

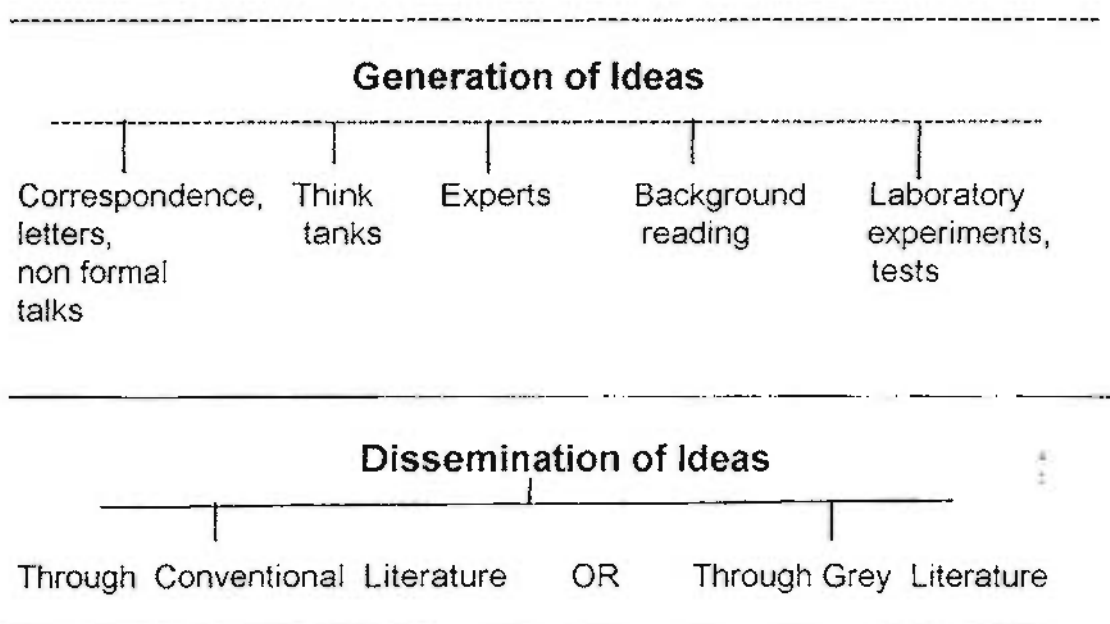
FIGURE 1. IDEA GENERATION & DISSEMINATION

Fig.1 gives a sketch of the idea generation & dissemination process. It is seen that grey literature serves as an equally important outlet to disseminate the ideas, particularly about which, say a final word is yet to be written.

The final output is a sum total of previous knowledge, acquired knowledge and intuition. Intuition is stimulated by discussions, personal talks, invisible colleges, unpublished literature and so on. The outcome is recorded in the form of unpublished laboratory results - which are crucial in decision making process, analysis of compounds obtained through analytical methods - more applicable in chemical and allied sciences, preliminary communications, preprints, feasibility reports etc. Some representative examples from different fields can be cited as -

Medical Sciences - Results of clinical trials, diagnostic data, pathology reports, case study reports.

Health & allied Sciences - Educative material like pamphlet literature produced for laypersons.

- | | |
|---|---|
| Political Science
and related
areas | - Speeches of political leaders, election manifestoes of
political parties, unaccepted govt. policies,
directives, policy documents |
| Economics &
Social Sciences
related | - Statistical reports, reports on turnkey projects,
development plans, social survey reports |
| Academic
related | - Convocation addresses delivered by eminent personalities,
training material, study material. |
| Business &
Industry
related | - Consultancy reports, project financing reports, sales
promotion data, tender documents, product catalogs,
safety data sheets, packaging specifications. |

In addition to these, there are publications of charitable institutions, trusts, tariff commission reports, literature produced by consumer guidance societies, souvenirs - most of which can be labelled as grey literature.

Among several of these examples, mention must be made of some less conventional sources of industrial information, exemplified by Karki (13) - which can very well fit into the category of grey literature. They are -

- | | |
|--|--|
| - Reports of the meetings | - Semi technical publications |
| - Announcements for shareholders. | - Irregular mimeographed publications |
| - Feasibility studies | - Chairmen's statements at annual meetings |
| - Ad-hoc & irregular publications of the organizations | - Safety data sheets |
| - hand outs | - Tender notices |
| - Newsletters or house journals of large industrial houses ,organisation | - Prospect sheets prepared by small industries |

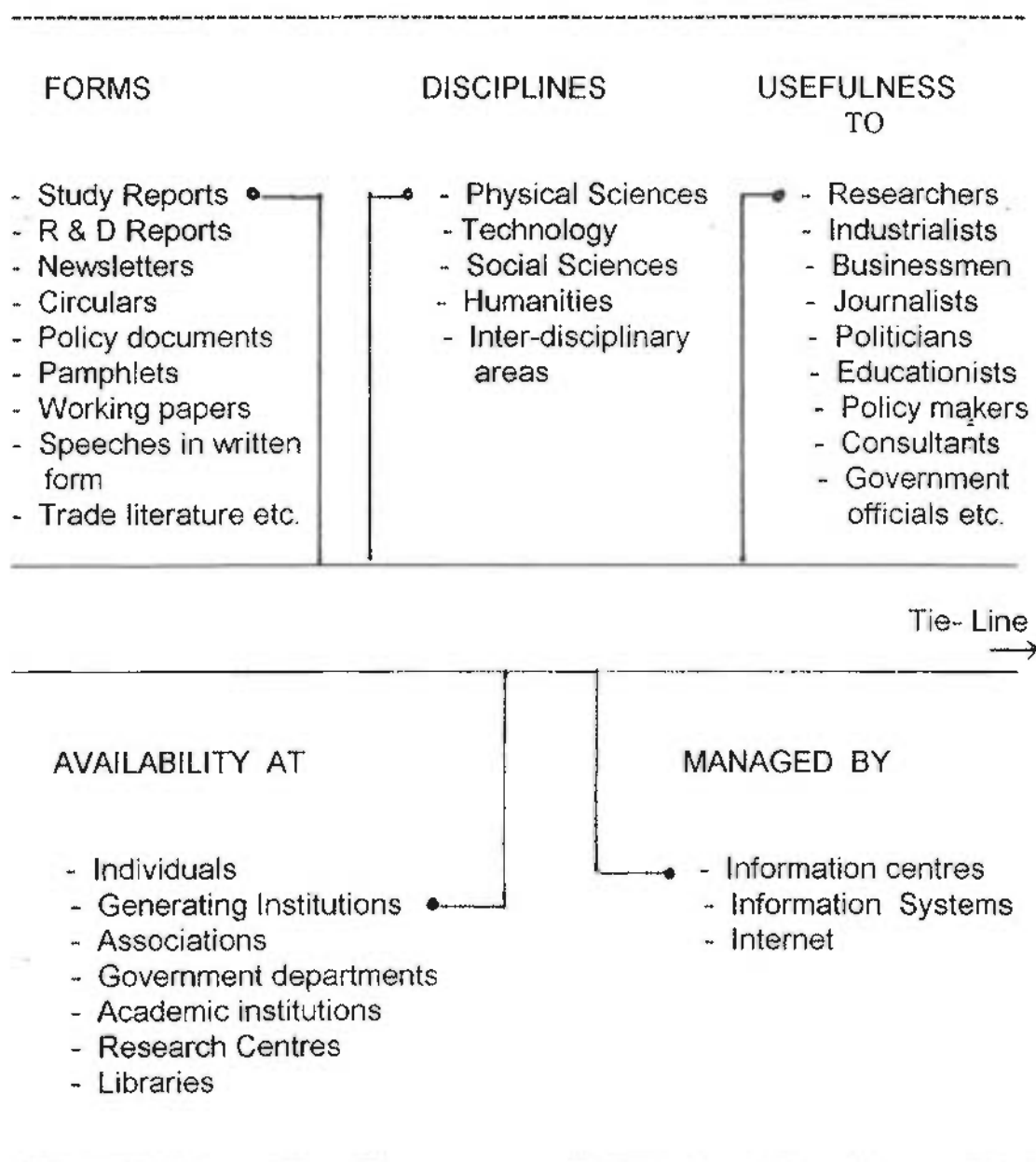
The decision is needed and judgement is to be made whether or not- all these varieties or few of these varieties should be considered for the definition of Grey Literature.

Thus, the complexity of grey literature variety is generated by diversified and interactive factors in terms of form of presentation, target audience, subjects or disciplines, knowledge about availability, accessibility and management. Therefore the definitional issue of Grey Literature can be called as a multidimensional one.

6. GENERIC DESIGN SCIENCE APPROACH

One approach to define Grey Literature could be through Generic Design Science methodology. The major step in this method is to capture all possible aspects of the situation under consideration. To operationalise this step, the dimensions characterising the situation and the elements defining each dimension are listed. Next, the relevant elements are to be connected through a 'Tie Line' and a suitable definition is to be generated varying with situation. Grey Literature has form, discipline, usefulness, source and management as principle dimensions as shown in the Figure 2. Elements expressing each of these dimensions are written. For example; Grey Literature in Physical Sciences, useful to Researchers may be brought out as Study Report by an Institution and is managed by an Information Centre.

FIGURE 2. MULTIDIMENSIONAL REPRESENTATION OF GREY LITERATURE

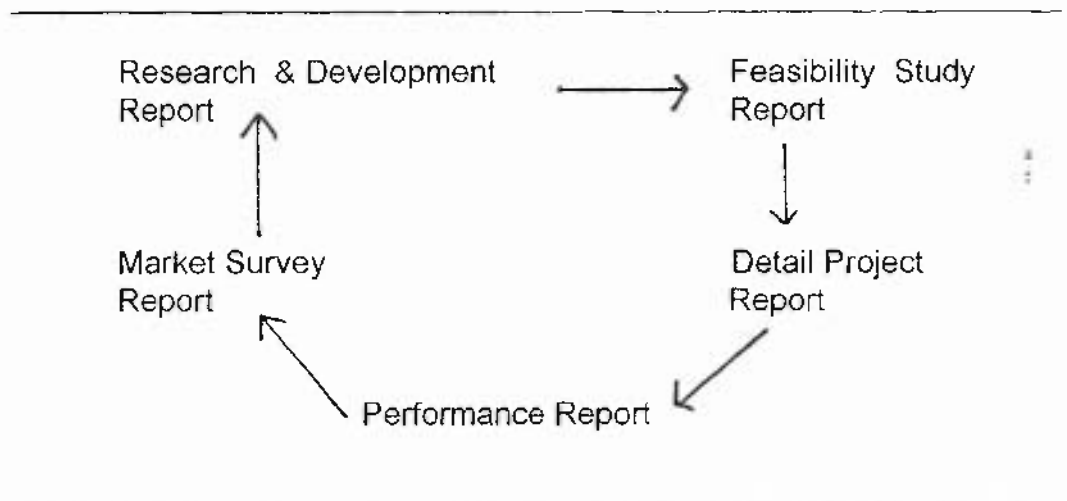


The dimensions and elements can be further added to refine the process. Through such a representation flexibility is offered to define the concept of Grey Literature. In the process, occasionally Grey Literature becomes conventional literature.

7. DISCUSSIONS

In some instances Grey Literature undergoes cyclic path e.g. Reports, as shown in Fig. 3.

FIGURE 3. CYCLIC TRANSFORMATION OF REPORTS



Often, all these reports remain confined to the office of institution and are not available for general consumption. This is commonly found in the industrial sector.

If grey literature is to be considered as primary source of information, it is expected to add to the knowledge. Some research is such that it cannot progress without consulting primary grey literature varieties and consulting this literature is a normal mode of study. This literature addresses practical and contemporary issues. Its value may reduce with time or it may take a new shape. The only constant factor of grey literature is its dynamic nature and changing behaviour. For the institution from where it originates, the literature variety is not 'grey' or 'inaccessible'. It is not widely publicized because the originators perhaps hold the view that it is of little value to others and to some extent it is secretive in content. Dasgupta (14) refers to DEVSIS study team which studied only six selected categories of grey literature

varieties generated in India in the area of Socio-economic development. The six varieties selected were -

- Government documents
- Project feasibility reports
- Working papers
- Research reports
- Seminar papers and
- Statistical documents

Although, these varieties were not mutually exclusive, such a categorisation was operationally convenient and hence the varieties were selected for their availability, accessibility and bibliographic control.

Any research team or an individual in any discipline can have more than one function like research, consultancy, advisory, administrative, policy making, regulatory, educative and informative.

Research may come out in the form of -

- Reports of several types
- Dissertations

Innovative work takes the shape of -

- Patents
- Trademarks
- Industrial designs

Measures of quality control are made available as -

- Standards
- Specifications

Working papers may get published as conference proceedings and are made available through normal bookselling channels in which case they ceased to be grey literature but if they remain unpublished, they become grey literature variety.

Out of the several varieties; over the years, some varieties have attained reasonably good bibliographic control which may be taken out of the purview of grey literature. This view is endorsed by Auger (15) in GL'93 wherein he has expressed that Patents and Standards are so well organised that they are not considered part of grey literature either.

The ultimate aim of any information generated in any form or media is that it should add to the productivity, provoke thinking, should be useful in decision making and should be consumed for meaningful purpose. One may take a generalist approach to the common characteristics of grey literature such as - small print runs, poor bibliographic control, non-conventional in nature and not available through normal bookselling channels. But then this approach may run the risk of concentrating on the nature and forms of publications - as documents for storage, availability and retrieval, ignoring its social implications. For example - views expressed by educationists, economists or scientists at convocations, formal meetings, seminars may provoke thoughts and ideas which would have long standing impact. Such documents may have contemporary value, they may not be permanent in nature, may not get published anywhere but could prove to be indispensable at times.

It thus emerges that-

- * Grey Literature is a category which is assigned by the body which generates it.
- * It refers to the purpose and the purpose decides its nature.
- * It has amorphous categorisation which need not be permanent.
- * It is time honoured literature and its life is limited in that particular form.
In some cases, grey literature undergoes transformation.
- * It is specific to the location and to the situation.
- * Its dynamism is imperative.

Therefore, Grey Literature can be defined as, “ **Grey Literature** is that literature generated by institutions for a meaningful purpose, which is transitory in nature having limited life span in a particular form. It is specific to the location and to the situation .”

Thus, definition of Grey Literature has more to do with philosophy of librarianship. Wood (16) had suggested that we do not get too bogged down in trying to define the term and that we just recognize that a large and increasing percentage of world's vital literature is not available through publishing trade. What is more important is its knowledge about availability, accessibility and document delivery. Understanding the nature of the problem is the vital factor. Given the diversity of publications and end users, an attempt to define 'Grey Literature' precisely, is not a straightforward task. But it need not be used as an umbrella term to cover everything that is non-conventional. Time is now sufficiently matured to have clear demarcation of varieties and their purpose. An ISBD(GL) may be created and be made compatible to MARC format for exchange of data, otherwise accessibility to grey literature varieties will be a serious problem. McDermott (17) has rightly said that these co-operative attempts must become part of what we consider a "normal acquisitions channel".

8. CONCLUSION

It is necessary to establish clear identity of grey literature varieties. This literature covers almost every field of knowledge. Some varieties are liable to be superseded in their content over a period of time, yet they are not easily replaceable. [Their availability largely depends upon the policy of the generating institution. Institutions may exercise their authority for whether or not all the documents should be made a public knowledge but their existence should be known.] There is a tremendous output of knowledge through grey literature variety and librarians should take a pragmatic approach towards it. The acquisition, processing, dissemination should be a part of collection development policies. Various current awareness strategies might be

employed to capture this fluid form of literature. Some well established varieties may be taken out of the purview of grey literature and for other varieties, special efforts may be made to achieve bibliographic control. Methods may be developed for their cataloguing, classification and indexing which eventually should become international standards. Ignoring this material will be dangerous in the long run. There is a lot of potential for systematic research in this area.

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Teaching the use of grey literature in Latin America

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Abstract

Professionals and specialists in Latin America have not paid very much attention to the question of identifying, locating and providing access to grey literature. It has not been treated as a subject of study and research, and when it has been included as an optional subject in courses at university level, it has not attracted many students. The reason for this is that a lack of understanding of the subject is still to be observed - although documentation centres specialising in different areas of scientific and technological information acquire and stock grey literature, this is still not seen as an important topic.

However, isolated experiments have been carried out in the area of education and training, for example in library schools in Venezuela and Puerto Rico. On the basis of experiments in these two schools, an account will be given of the content, methodology and approach of the courses; of the results observed at student level; of the interest created; and of the successes obtained with specific university programmes.

In particular, a large gap has been noted: in the area of theses, research reports and conference proceedings.

1. BACKGROUND.

An unexplored potential.

I first became aware of grey literature in the 1980s when I was undertaking professional library training in documentation centres in France and Italy specialising in international development and social sciences. IDOC (International Development Centre) in Rome ran a series of courses to intended to lay down methodological guidelines for the organisation of social science documentation centres in developing countries.

In the teaching programme, one significant topic was so-called "fugitive" documents (meaning: transient, or ephemeral). It was pointed out that traditional librarians attached little importance to precisely this type of document, because of its informal and flimsy format, although the material's content was a primary source of information [1]. The most important aspect of this training course was that the documentalists taking part became motivated to conserve the internally-produced documentation of social science organisations.

Secondly, having created and organised the documentation centre of a research institute specialising in rural development, CIPCA [Centro de Investigacion y Promocion del Campesinado], in the north of Peru, I had learned how to deal with grey literature in the form of theses, reports and research reports, proceedings of conferences and seminars, and above all local information produced in the region. The collection of CIPCA's documentation centre included the social science grey literature about the region of Piura [2].

At the same time, directing the documentation centre brought me into contact with other similar documentation centres of Latin American NGOs, where I observed that the collections of these specialised documentation centres were made up principally of grey literature - a type of documentation that was overlooked by staff of traditional university or public libraries [3].

My interest in grey literature was further aroused when I was preparing my doctoral thesis. When considering the library infrastructure of Latin America, and observing its development from the perspective of the past 30 years, I had to consult sources such as theses, studies, conference proceedings, research reports written about this topic. When doing my bibliographic research, I was surprised to find how difficult it was to access this material in the countries that produced it. In very few cases had this material been put into libraries; in most cases it had remained in the possession of the persons who had attended the meetings in question, or it had simply not been processed. In each case, I could access the material in US libraries devoted to Latin American studies, such as the University of Texas at Austin.

Having finished my doctoral studies, I began to do teaching and research. I observed that there was a great gap in the professional training courses offered by universities: there was no course dealing with grey literature. For that reason I developed and offered a course which I was asked to give in two countries of the Spanish-speaking Caribbean region: Venezuela and Puerto Rico.

2. TEACHING GREY LITERATURE.

There are around 100 schools of library and information science in Latin America, of which Brazil has 30, Argentina 28, Mexico 6, Colombia 4, and the other countries have one or two each. Most of the courses lead to the 'licenciatura' (equivalent to a bachelors degree): Brazil offers 3 doctoral programmes and 6 masters, while Mexico, Puerto Rico and Costa Rica each offer one masters programme.

At the present time, due to the need to confront the new demands of information and communication technologies, to the new emphasis on information services and information sources considered as consumer goods capable of generating economic resources, most of these Schools are in the process of bringing their curricula up to date. One observed weakness is that the lack of strong collections in LIS continues to be a real problem for all the Schools in the region, as is the lack of resources available for research and publication [4].

The School of Library and Archive Studies of the Central University of Venezuela (UCV), a state university founded in 1948, forms part of the Faculty of Humanities and Education. The teaching staff of the School consists of 52 persons, of whom 9 are full-time. The course leads to the 'Licenciatura en Bibliotecologia', which is granted on completion of 180 study credits and a dissertation [5].

The Graduate School of Library and Information Science (EGBCI) of the University of Puerto Rico, in San Juan (Rio Piedras campus), was founded in 1969. In 1989 it was accredited by the American Library Association. The staff includes 8 full-time teachers and 3 part-time. A three-year course including 42 credits leads to the degree of 'Maestria en Bibliotecologia' [6].

Problems encountered.

When I was preparing the course on 'Bibliographic control of grey literature', I struck a problem with the professional literature: very little had been written in Spanish or Portuguese [7]. Secondly, I noticed that a large proportion of the literature on the topic had been published in journals to which the Schools did not necessarily subscribe. To obtain the information, I inevitably had to look further afield.

Another question I asked myself was 'how to awaken the interest of the students in the course': how was I going to arouse interest in a topic so foreign to the usual preoccupations of the profession which is immersed in the new demands of new technologies, in dealing with the management and sale of services, or with new courses like bibliometric studies or information networks.

The topic of grey literature posed a problem of definition. The first thing my colleagues on the staff asked me was, what was grey literature? The first thing to be dealt with was my colleagues' lack of knowledge of grey literature. Moreover, it could be said that GL was seen as too specialised, as a topic of limited relevance to current professional interests.

As a result, these considerations were reflected in the number of students enrolling for the course. In Venezuela, I had four students, and in Puerto Rico seven.

Development of the course.

Concerning the justification of the topic, I considered the strategic role which scientific and technical documentation played in the production and transmission of knowledge, and the fact that in many cases these documents are not commercially published. Further, the circulation of these documents, and access to them, is primarily restricted to scientists and researchers and much less to information specialists. Hence the need to provide bibliographic control, apply appropriate methodological and technical processing, and guarantee access to the distribution circuits by professionals in the area of library, archives and documentation studies.

Aims of the course:

- analyse grey literature as a product of scientific and technical documentation.
- examine the way grey literature circulates, how to locate and access it.
- study the processing, analysis, retrieval and dissemination of grey literature.
- establish a typology of the material.
- analyse the institutions which work in bibliographic control of grey literature.
- develop guidelines and definitions for policies for access to and retrieval of grey literature in Venezuela and Puerto Rico.

The course was organised over 17 weeks in 5 modules. The first three modules analysed different definitions and the typology of the material, and dealt with the theme of identifying and accessing grey literature in different environments: in universities, in scientific research establishments, and in industry. The analysis also covered electronic documents. For technical processing and databases, an analysis was made of the examples of NTIS, EAGLE and INIST.

The last two modules covered the analysis and conduct of a short study project of a real situation in Venezuela and Puerto Rico. For this purpose a series of visits were made to institutions - preferably to academic institutions, and to city halls in the case of Puerto Rico - which were likely to have grey literature in their collections, to observe how these documents were processed and distributed.

The result of the course was to generate a series of proposals to allow local information professionals to integrate the processing of this material and access to grey literature into their professional practice, for knowledge generation, not just from the perspective of difficulties in-processing material regarded as 'ephemeral'.

In that way GL became something tangible, accessible, and a subject of discussion, because many questions arose when it was observed how grey literature was in fact absent from the collections of institutions reputed for the quality of their students' work.

- For example, access to theses: even in libraries where online access to a union catalogue was possible on NOTIS, it was observed that theses had not always been adequately processed nor even distinguished from other types of traditional documents such as monographs. Due to lack of analytic abstracts, information that would have been very relevant to research projects could not be retrieved.

- In the case of the University of Puerto Rico Library at Rio Piedras, it was noted that reports and proceedings were subject to much longer processing times than monographs or journals, from the date of acquisition.

The students carried out individual studies on their specific subjects. For example, in Caracas (Universidad Central de Venezuela) I had a student interested in developing a policy for collecting grey literature for the documentation centre of the milk products factory where he worked; and another student was interested in the problem of the obsolescence of grey literature in a specific collection in the social science documentation centre of UCV.

In San Juan I had a student who investigated the difficulties in accessing theses in the department of Hispanic Studies of the University of Puerto Rico [8]; and another who analysed the situation of grey literature (ephemera) in the library of the Planning and Budget Department of San Juan municipality [9].

3. RESULTING PROJECTS.

One immediate result of the course was that analysis of local circumstances impelled the development of proposals for control of grey literature in each country. In the case of Venezuela, a proposal was developed specifically for UCV: 'Strategies for the

collection of grey literature for scientific and humanistic knowledge in Venezuela"[10]. In the case of Puerto Rico, the students developed a proposal for the organisation of the Puerto Rican materials collection of the UPR University Library System [11].

The Venezuelan project.

The project was located in the Universidad Central de Venezuela. Its aim was to improve the availability of and access to grey literature in the humanities in the two university libraries: the central library and the library for postgraduate studies in history, geography, psychology, literature and education. In order to carry out the project, it was proposed to make an inventory of grey literature in the humanities to gain quantitative and qualitative data. It was also proposed to develop methodological guidelines, and guidelines for two databases: one of ongoing research projects, and another of the papers and lectures of the researchers.

Finally, in integrating these humanities databases with other pre-existing databases in libraries specialising in social sciences, the intention was to create a nucleus of coordination to ensure follow-up of specialised grey literature in the social sciences and humanities.

The Puerto Rican project.

The aim of the Puerto Rican Materials Collection is to serve the university community, both at the Rio Piedras campus and through the Library System of the University of Puerto Rico, in its search for material concerning Puerto Rico, for information and research. The collection consists of works written by Puerto Ricans, and works about Puerto Rico wherever published. Among the collection are monographs, journals, official publications, theses, conference papers, and research reports. This wealth of documents covers the following branches of knowledge: philosophy, social sciences, languages, literature, natural sciences, music, art and history. 'Grey' documents, apart from theses, dissertations and official publications, were treated as ephemera. This meant that research reports and conference proceedings were treated in an unsystematic way, in the absence of any acquisitions policy or selection criteria.

The proposal emphasised the need to systematise each type of document as a separate category, and set out a collection development policy for each type. As far as theses were concerned, the proposal was to create a union catalogue, because the greatest problem for users was access to theses not all of which were processed (in fact, only 50% of theses on Hispanic Studies were processed).

4. LOOKING BACK.

What were the positive results of the course?

- First: it aroused an interest in grey literature that was not limited to the students following the course. I was asked to run workshops for other professionals in the university libraries of San Juan in Puerto Rico, who wanted to understand more practically what grey literature was. These workshops set a discussion going and provided elements of methodology for the processing of material referred to as 'ephemeral'.

- Second: the focus on grey literature created its own reality: it could be seen that local information collected in reports, research studies and conference papers was poorly circulated, and that its circulation was even limited to a group of researchers. Specialised librarians did not have access to it, at least not until much later, meaning that information was lost.

- Third: the development of the course served to analyse the most frequent ways in which grey literature is processed in specialised libraries, and how it circulates. Quite simply, it is given a very low priority: processing of research reports and conference proceedings takes too long, and not all theses presented in all the university's teaching programmes are available in the union catalogue.

- Fourth: the course led to concrete projects. For example, in the National Library of Venezuela, the heading "grey literature" was created in the collections, and a survey of all the Venezuelan grey literature in the Library was carried out. As a result, this material was no longer just put straight into vertical files but was processed. In the case of Puerto Rico, the project continues in the Library School (EGBCI), aiming to create a union catalogue of theses for the University of PR.

- Fifth: the course showed that the inclusion of practical workshops for different types of specialised libraries helped to understand the problem of grey literature in the collections. It showed how, due to lack of knowledge and lack of an internal policy for technical processing both in UCV and UPR, grey literature was not adequately processed and was delayed. When I realised this, it became obvious that short workshops were needed for the staff working in technical processing.

- Sixth: the course showed the need to explain what is covered by the concept of grey literature. I observed that the course in fact served two purposes: research into the subject under discussion, and updating of professional training. It also happened that the course led to the inclusion of the subject of technical processing of grey literature in undergraduate programmes, linked to collection development.

- Seventh: the students requested that material be translated into Spanish: having to read material in English was a deterrent. Four texts in Spanish (about the use of theses and conference proceedings in Spain) aroused more interest: the students

commented to me that it was like reading about something unrelated to their environment. However, by reflecting on their own realities and visiting institutions, observing the state of collections, they grasped the subject and made it work for them.

5. FUTURE PLANS.

The plan is to teach the course again in July 1998 in the Escuela Interamericana de Bibliotecologia, at the University of Antioquia in Medellin, Colombia. Should this be confirmed, some changes would be made, not in the conception of the course but in its practical application. In this case, in parallel with the course, I would study the way in which organisations work with grey literature in Colombia, particularly Colciencias, and analyse the training needs on the basis of this professional experience.

In this way, I would seek to develop work related to a practical purpose, which could contribute to the creation of grey literature centres within the country, and in each region progressively.

However, I would do this with caution. For example, while I was working on the development of the course, I received offers. From the EGBCI in San Juan came the proposal to make a union catalogue of theses for the University of PR; but this did not get very far, due to lack of funds.

It is also clear that, with the modern use of electronic documents, there has been a change: we now speak more of **grey information**. However, in practice, use of the Internet in national (state) universities such as UCV or UPR is not great, neither by library professionals nor by students. Electronic mail is available in the universities but navigation of the Internet is developing only slowly.

It should be borne in mind that private universities in Latin America continue to be areas of modernity and information access, but only for restricted groups, professional circles who have access to the markets. These universities are generally not the places where the civil servants and decision-makers of the country are trained, those who are going to build the institutions of society.

Such persons are generally trained in the national universities. It is precisely these decision-makers that we need to work with, because they will decide on the information policies within which our libraries will have to work, they are responsible for the future of our libraries. This is where we need to introduce new notions of research.

6. CONCLUSION.

So a course taught in two countries of the Spanish Caribbean opened the door to a debate, encouraged professionals to include grey literature as a specific category of document to be processed in special collections, and seemed to point logically toward a follow-up activity.

Two possibilities could be: to run a seminar on grey literature in Latin America, and to do a survey: creating a working group with members in certain regions, because much local [regional] information is not considered when processing document collections.

It has been observed that this information remains in the offices of decision-makers or researchers without necessarily circulating to documentation centres and special libraries. The bibliographic control of this material is weak, which indicates that it is necessary to create regional centres in Latin America to put into practice a systematic collection development policy for grey literature - so that collection should not just be left to isolated projects.

Finally, I consider it important to spread information about grey literature to other cultural and linguistic regions, by a series of specialised seminars. In this way we could revitalise professional training from the ground up, and not leave it to chance discoveries when new professionals enter the world of work.

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INTERNATIONAL GUIDE

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Grey Literature - Grijze Literatuur
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Compiled by
Dominic J. Farace

With the assistance of
Jerry Frantzen

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IVIR	Instituut voor Informatierecht, University of Amsterdam	Holland
IZ	InformationsZentrum Sozialwissenschaften	Germany
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