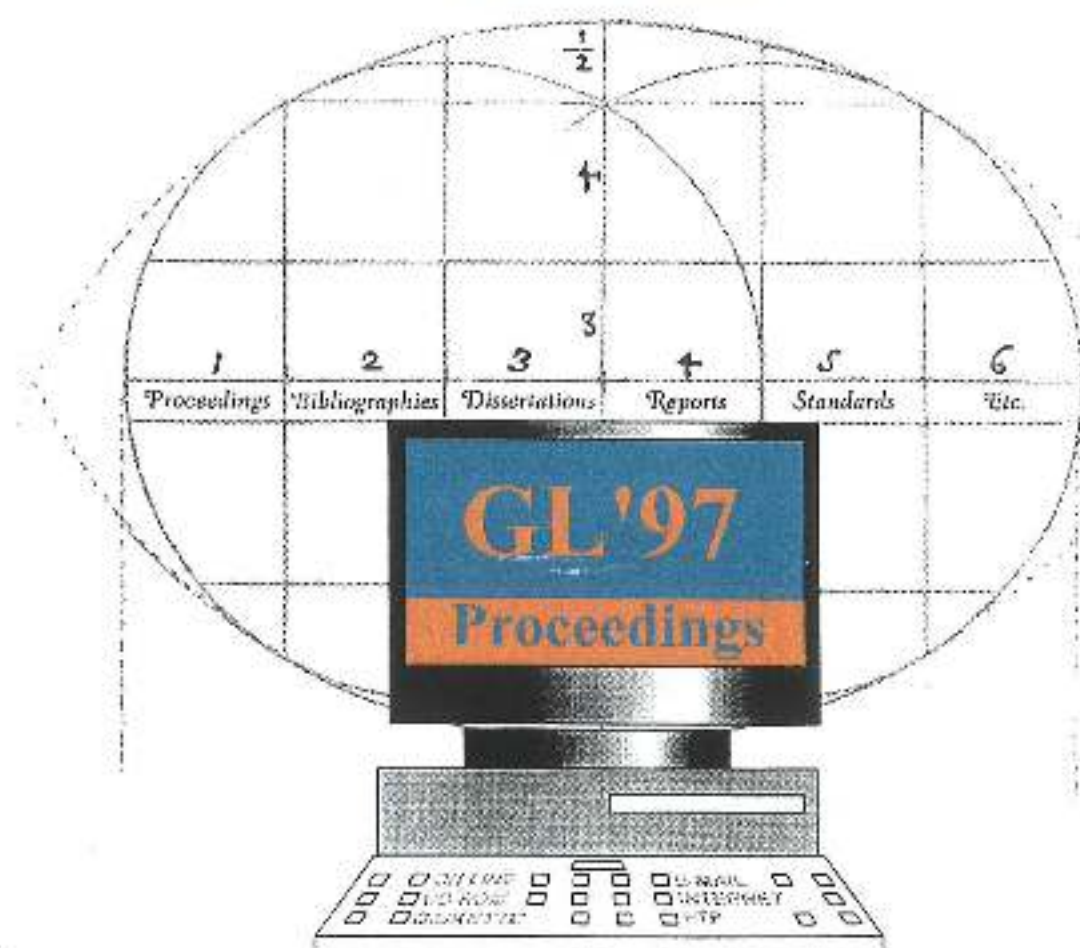


# THIRD INTERNATIONAL CONFERENCE ON GREY LITERATURE

JEAN MONNET BUILDING, LUXEMBOURG  
13-14 NOVEMBER 1997



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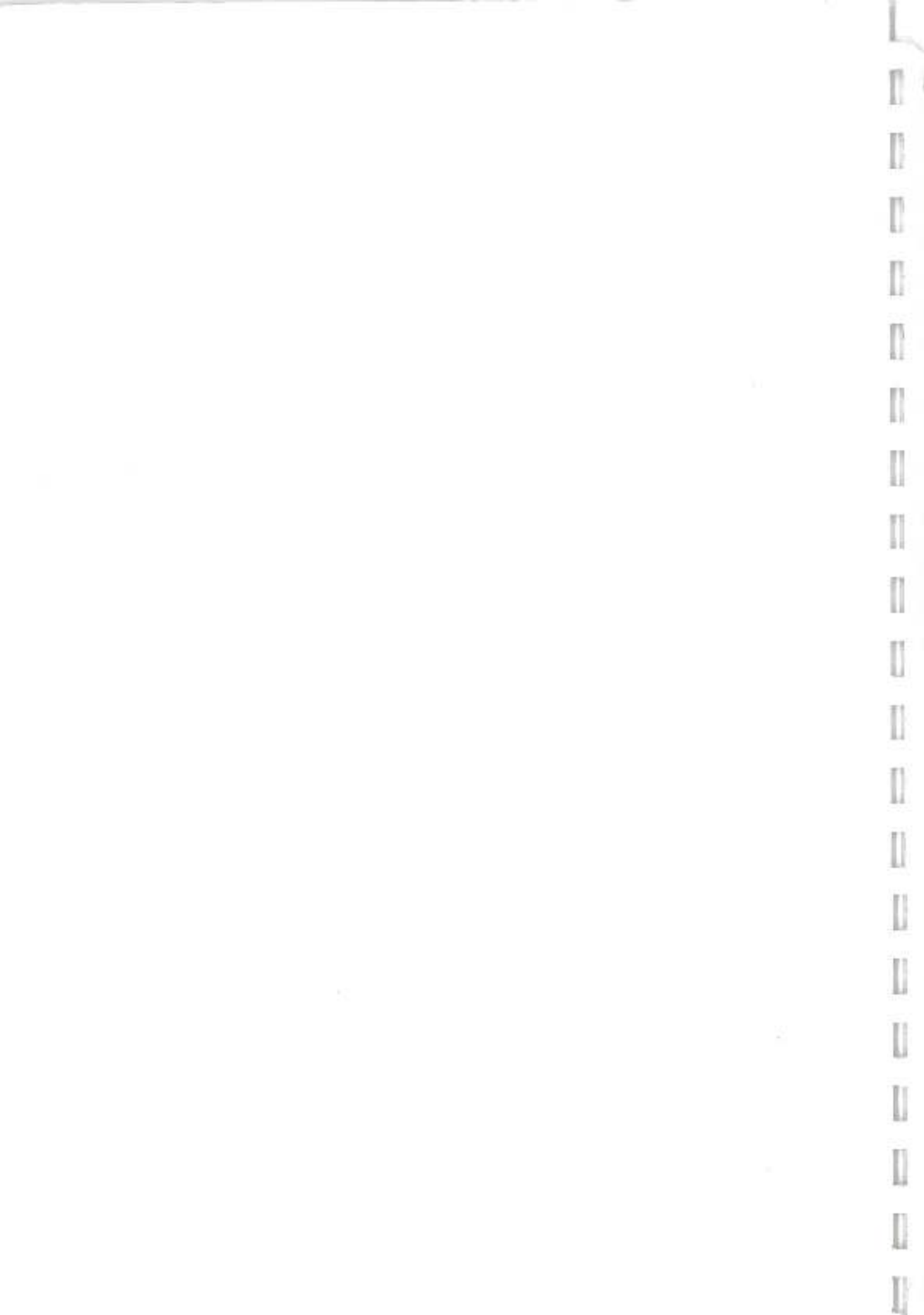
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**GL'97 Program and Conference Bureau**

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*Contains the full text of the papers presented during the Plenary and Cluster Sessions*



## 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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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 areas 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 company's 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.

[ SIG's ] 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

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*Def. 1.1.1*  
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
<b>Relative volume</b>	Increasing	Decreasing
<b>Speed of production and delivery</b>	High	Low
<b>Cost of information</b>	Low, decreasing	High, increasing
<b>Accessibility</b>	Global, unrestricted	Limited, restricted
<b>Quality control</b>	To be provided by innovative technologies	Organised through traditional peer review process
<b>Long-term archiving</b>	Problematic due to volume and technological ageing	Problematic due to legal restrictions and technological ageing
<b>Role of libraries</b>	Loss of traditional roles Opportunities for new services	Limited by legal restrictions
<b>Role of publishers</b>	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 eroertem. 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 events<sup>1</sup> 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:

<sup>1</sup> 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.

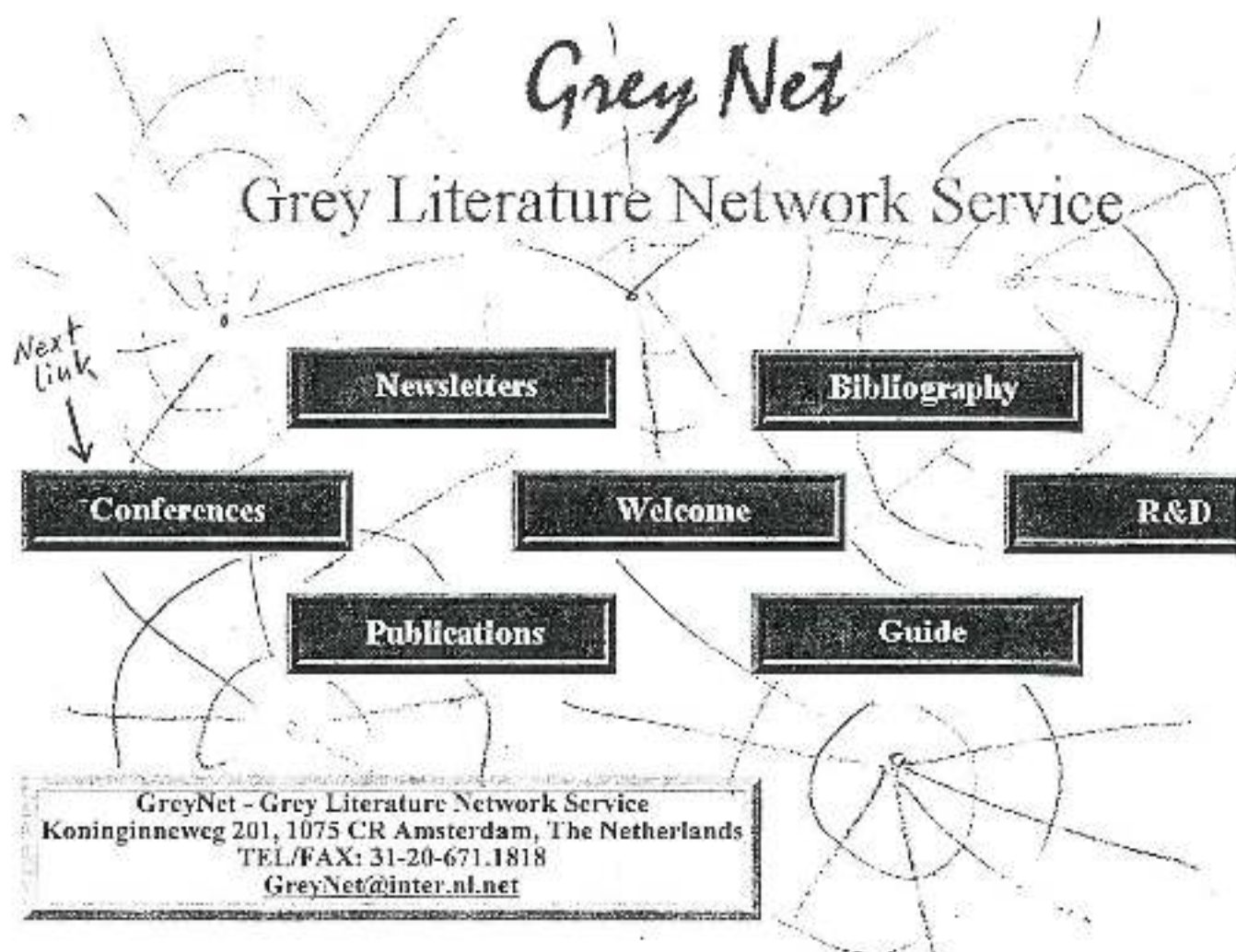
If, however, you use my calendar of events, you just have to click on Dominic's internet address (URL), and within a few seconds this brings you exactly to the computer with this address, wherever in the world it may be: in Australia or Japan, in Berlin or Amsterdam or just around the corner.

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](mailto: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

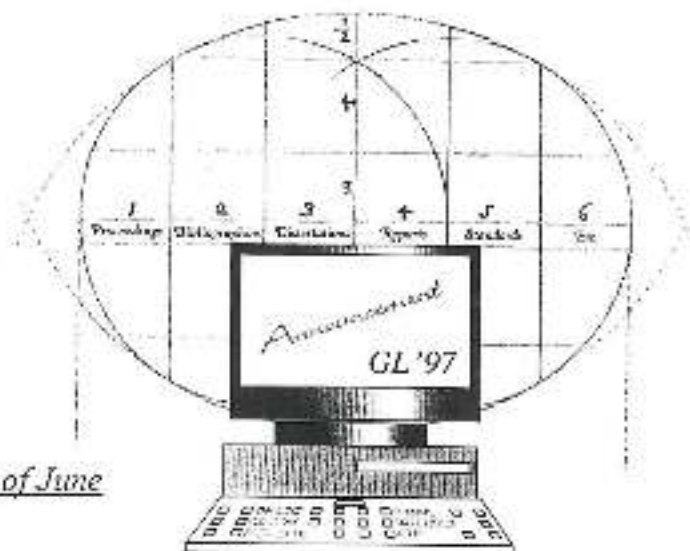
## GL'97 Pre-Program

### 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:

Postcode/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](mailto:GreyNet@inter.nl.net)

So you can read a text - in this case the calender 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 calender 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 calender 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 plena, 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 calender of events. So by just presenting the URL as a clickable hyperlink, the calender 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.



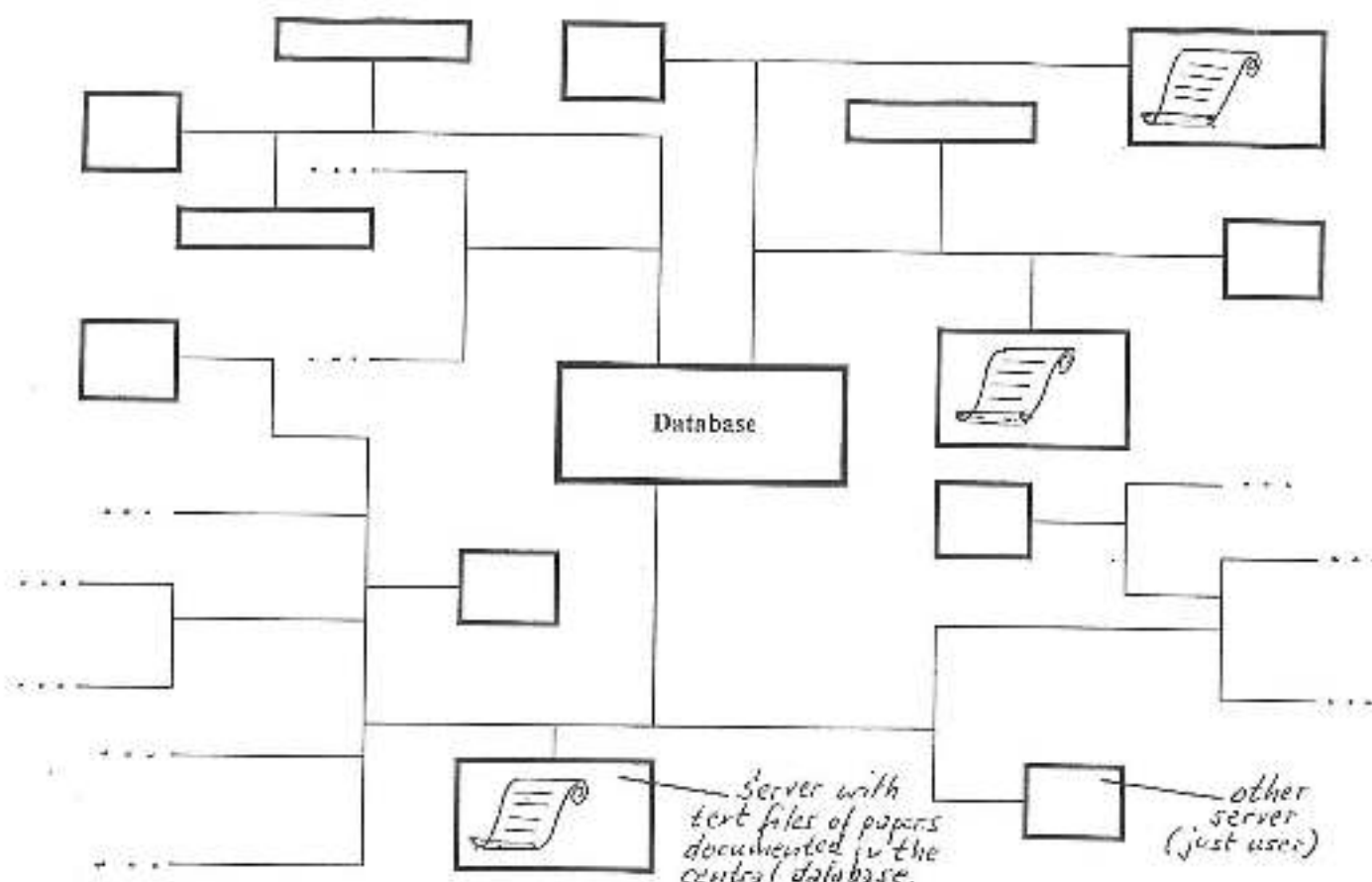
**Table 4: Bibliographic entry in database SOLIS with hyperlinks****SOLIS COPYRIGHT 1997 Informationszentrum Sozialwissenschaften**

<b>Logical part 1: Bibliographical data</b>	
<b>TITLE</b>	The Public Sector: challenge for coordination and learning.
<b>AUTHOR</b>	Herausgeber: Kaufmann, Franz-Xaver (Universitaet Bielefeld Institut fuer Bevoelkerungsforschung und Sozialpolitik -IBS- <Postfach 100131, D-33501 Bielefeld>)
<b>SOURCE</b>	Berlin: de Gruyter. 1991. XI, 553 S. (zahlr. Abb. u. Tab.)
<b>SERIES TITLE:</b>	De Gruyter studies in organization, Bd. 31
<b>ISBN:</b>	3-11-012380-0
<b>Logical part 2: Descriptive elements</b>	
<b>DOCUMENT TYPE</b>	monograph; (Sammelwerk)
<b>COUNTRY</b>	Deutschland, Bundesrepublik
<b>LANGUAGE</b>	English
<b>ABSTRACT</b>	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 Lemens diskutiert. In einem abschliessenden Teil werden institutionalisierte Formen von Koordination verglichen (Markt, Hierarchie, Solidaritaet) sowie Netzwerke und Beziehungen zwischen Organisationen analysiert. (ICE)
<b>Logical part 3: Descriptors</b>	
<b>CONTROLLED TERMS:</b>	public sector; public administration; politics; political action; administrative action; evaluation; implementation; political administrative system
<b>CLASSIFICATION CODE</b>	10207* (Sociology of Organisation)
<b>METHODS</b>	descriptive; theory application
<b>Logical part 4: Hyperlinks</b>	
<b>e-mail address:</b>	<a href="mailto:ar@bevoelk.uni-bielefeld.de">ar@bevoelk.uni-bielefeld.de</a>
<b>Internet address:</b>	<a href="http://www.uni-bielefeld.de/IBS/">http://www.uni-bielefeld.de/IBS/</a> <sup>2</sup>

<sup>2</sup> 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 unethic 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!

J.

## 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 Cruickshank 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 repackage 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 Jarvenpaa, 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, Jarvenpaa, 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 (Boha, 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 IC<sup>2</sup> (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
- b. Foreword
- c. Preface
- d. Contents
- e. Summary
- f. Introduction
- g. Symbols List
- h. Glossary of Terms

- i. Description of Research Procedure
- j. Results and Discussion
- k. Conclusions
- l. Appendices
- m. References
- n. Tables
- o. Figures
- 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

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

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  $n_t$  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-Authored 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		Description of research procedure		Description of research procedure	
Preface	84.5	Preface	59.3	Preface	71.9
Figures	15.2	Figures	32.9	Figures	24.1
Symbols list	79.4	Symbols list	62.3	Symbols list	70.9
Glossary of terms	47.3	Glossary of terms	27.7	Glossary of terms	37.5
Tables	31.9	Tables	26.2	Tables	29.1
References	63.3	References	50.2	References	56.8
Appendixes	63.3	Appendixes	49.5	Appendixes	56.4
Summary	62.6	Summary	39.7	Summary	51.2
	79.4		85.0		82.2



Table 2. Weighted Average Ranking: Order in Which LARC-Authorited 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-Authoried 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-Authoried 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 (16.8% 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 <sup>12</sup> ) 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., Jones<sup>12</sup>) 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.

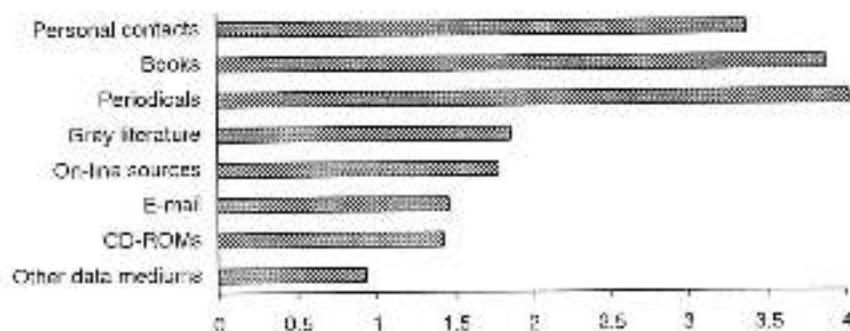


Figure 1. Significance of information sources

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].

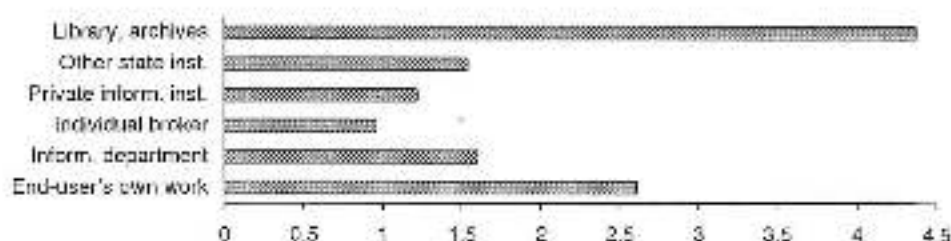


Figure 2. Significance of information brokers

### 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).

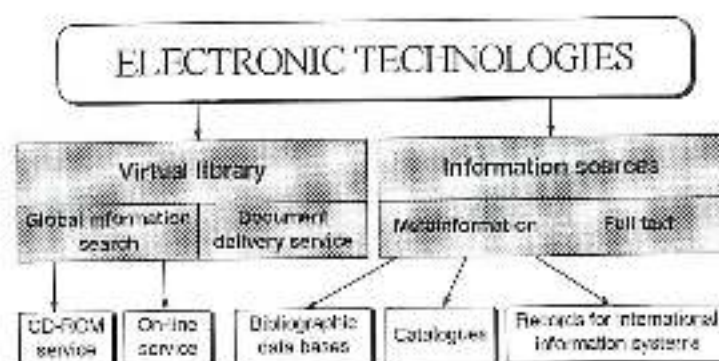


Figure 3. Applications of electronic technologies for grey information supply

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.

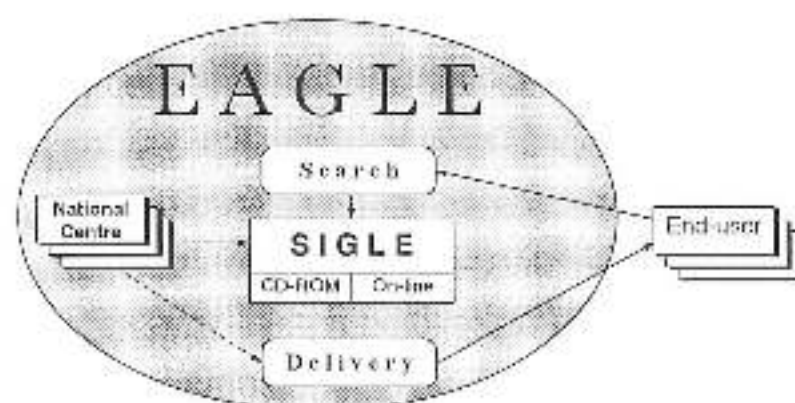


Figure 4. Integrated service provided by EAGLE.

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 Parace, 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-ninch.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/azp/azphome.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. <http://web-dubois.fas.harvard.edu/DuBois/Research/SlaveTrade.HTM#anchor1964630>

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. <http://web-dubois.fas.harvard.edu/DuBois/Research/SlaveTrade.HTM#anchor1964630>

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. <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.ieop.ucla.edu/ngpp/>>

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/lnc/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 (HSIs); 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](http://www2.cr.nps.gov/abpp/bu_past/sm96seve.htm)>

## Conclusions

Although the WWW boasts numerous guides, directories, and bibliographies, 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.sasnet.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](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, &amp; 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.cu.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 APIAHP 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.

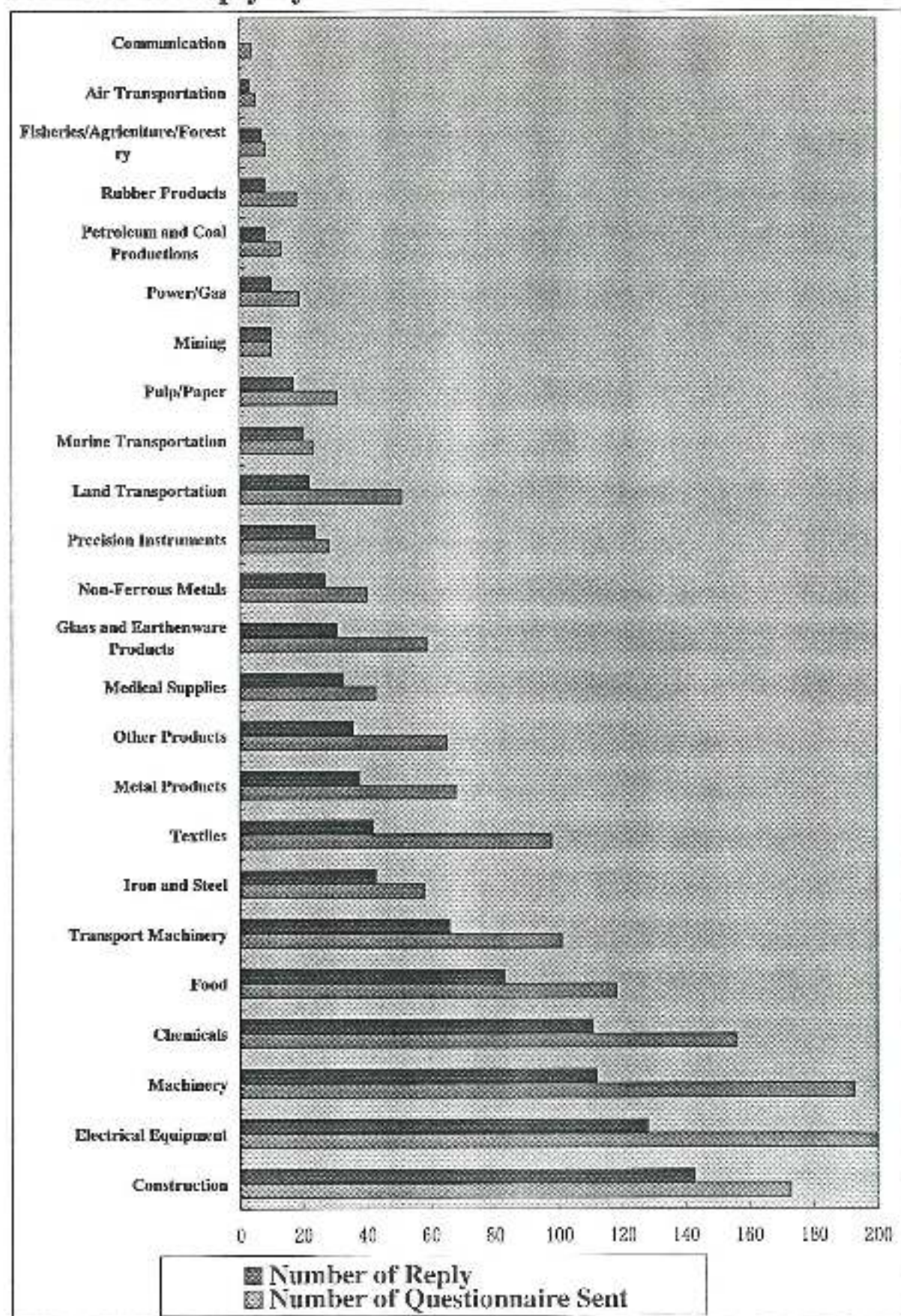
JST will, as a central organ of Japanese scientific and technological information, continue to make efforts to collect, process and distribute Japanese information by satisfying comprehensive coverage and timeliness in the future as well.



**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%
<b>Total</b>	<b>1582</b>	<b>1022</b>	<b>64.6%</b>

**Fig.1**  
**Number of Reply by Industries**

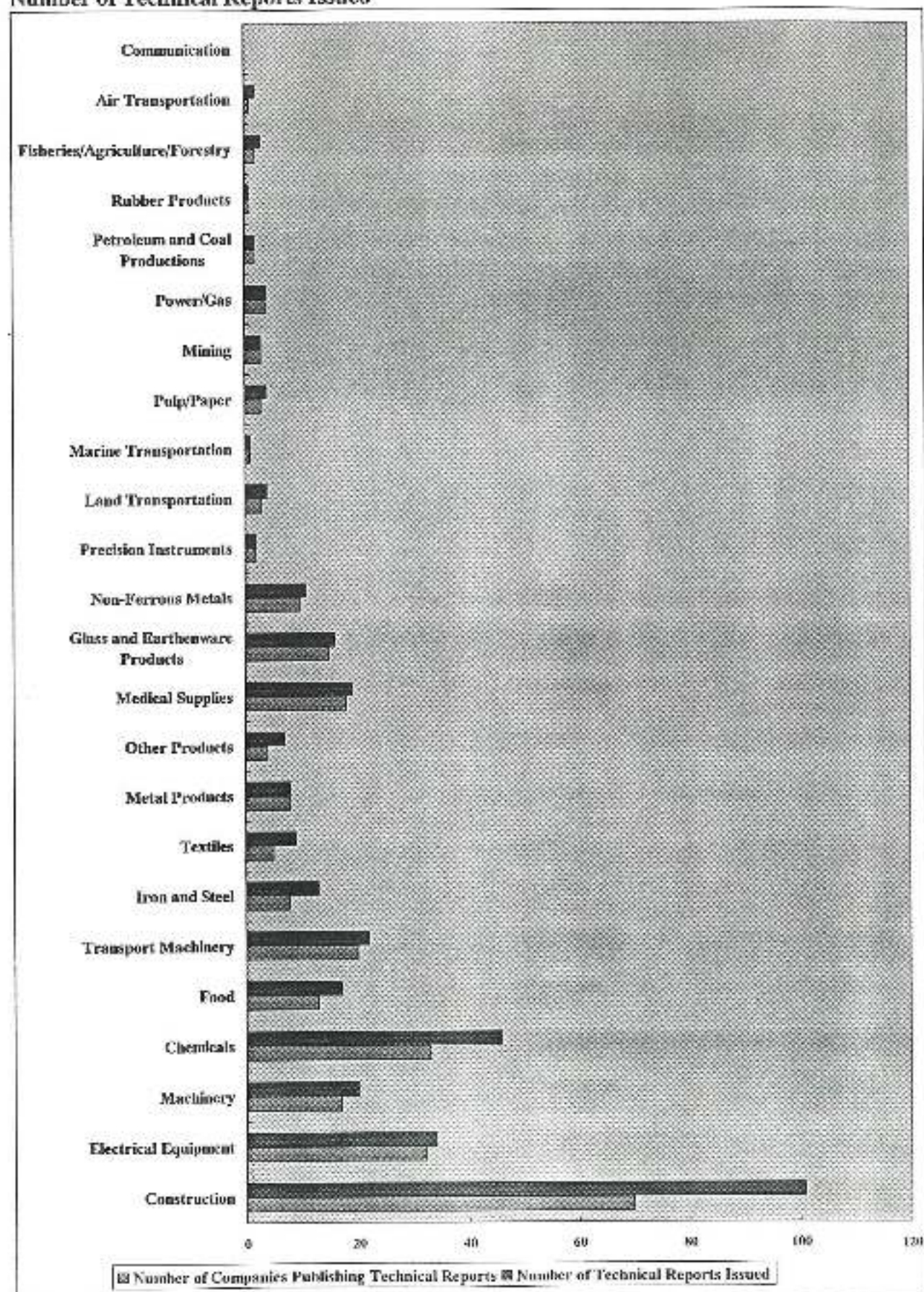




**Table 3**  
**Number of Technical Reports Issued**

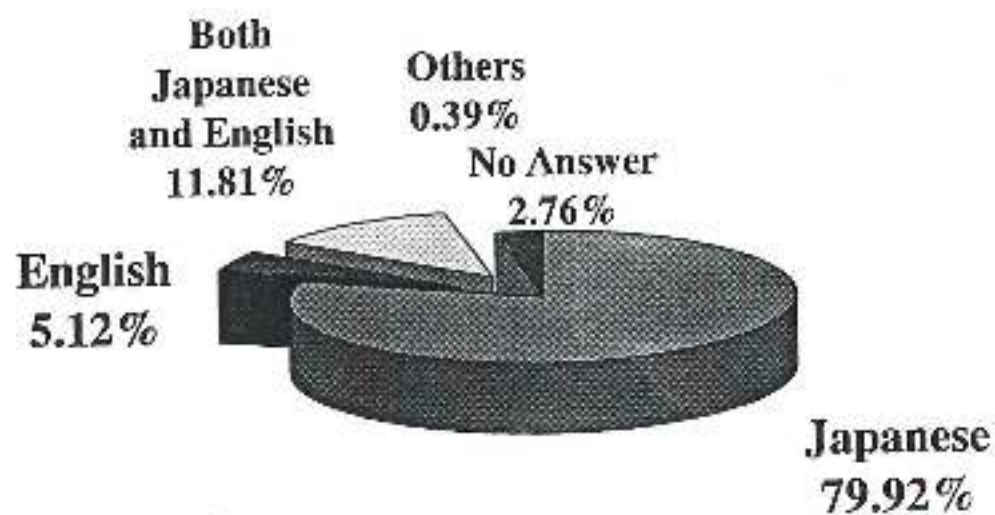
<b>Industries</b>	<b>Number of Companies Publishing Technical Reports</b>	<b>Number of Technical Reports Issued</b>
Construction	70	101
Electrical Equipment	32	34
Machinery	17	20
Chemicals	33	46
Food	13	17
Transport Machinery	20	22
Iron and Steel	8	13
Textiles	5	9
Metal Products	8	8
Other Products	4	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
<b>Total</b>	<b>275</b>	<b>349</b>

Fig. 3  
Number of Technical Reports Issued

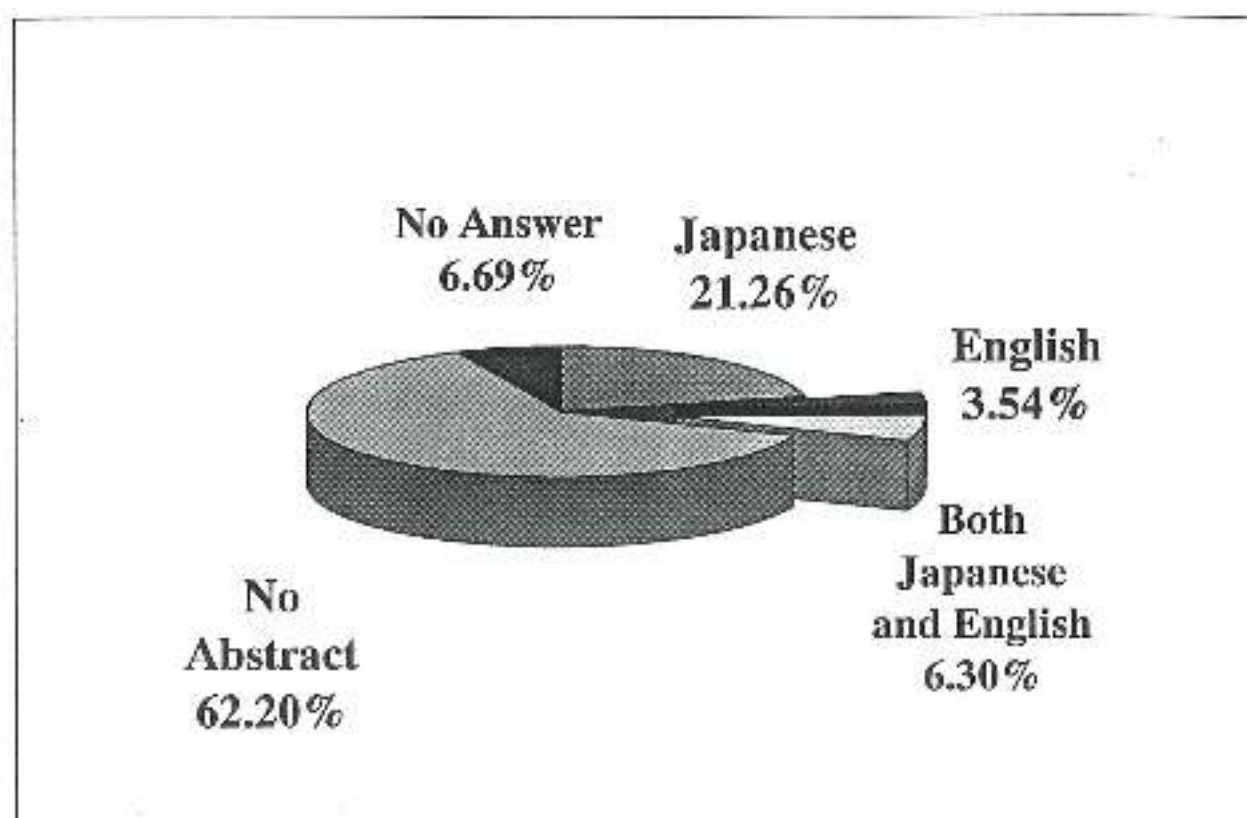




**Fig.4**  
**Languages**



**Fig.5**  
**Abstract and It's Language**





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

ELVIRA MUÑOZ-MOYA

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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 : [solc@iisl.softec.es](mailto:solc@iisl.softec.es)  
Centre of Documentation : [elvira@iisl.softec.es](mailto: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

President CRL, The Center for Research Libraries

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 used 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**

Ichiko T. Morita, Head, JDC  
U.S. Library of Congress

### **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 definition<sup>1</sup> which is based mainly on Hayashi<sup>2</sup> and Hanada<sup>3</sup> and also based on practice, as it applies to the Japan Documentation Center's functions.

*Definition*  
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.<sup>4</sup> 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."<sup>5</sup>

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,"<sup>6</sup> 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"<sup>7</sup> 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.<sup>8</sup> 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.<sup>9</sup> One result was passage of the "Japanese Technical Literature Act of 1986."<sup>10</sup> 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.<sup>11</sup> 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.<sup>12</sup> 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.<sup>13</sup> 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.<sup>14</sup>

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."<sup>15</sup> 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*.<sup>16</sup> 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.<sup>17</sup> 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.

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16. Japan Foundation, 3.

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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?

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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.

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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)

Author's  
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	465	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	
	non-conventional >20%	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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