



Online and CD-Rom Review

GERMAN DATABASES FOR NATIONAL AND INTERNATIONAL USERS, USING ENVIRONMENTAL DATABASES AS AN EXAMPLE

Kristina Voigt, Eleonore Poetzsch, Martina Reich, Thomas Schultz-Kruitisch, Engelbert Zass,

Article information:

To cite this document:

Kristina Voigt, Eleonore Poetzsch, Martina Reich, Thomas Schultz-Kruitisch, Engelbert Zass, (1995) "GERMAN DATABASES FOR NATIONAL AND INTERNATIONAL USERS, USING ENVIRONMENTAL DATABASES AS AN EXAMPLE", Online and CD-Rom Review, Vol. 19 Issue: 2, pp.71-77, doi: 10.1108/eb024525

Permanent link to this document:

<http://dx.doi.org/10.1108/eb024525>

Downloaded on: 22 May 2017, At: 07:25 (PT)

References: this document contains references to 0 other documents.

To copy this document: permissions@emeraldinsight.com

The fulltext of this document has been downloaded 26 times since 2006*

Access to this document was granted through an Emerald subscription provided by emerald-srm:514443 []

For Authors

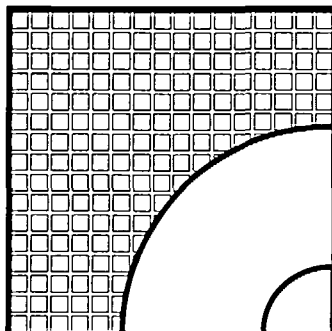
If you would like to write for this, or any other Emerald publication, then please use our Emerald for Authors service information about how to choose which publication to write for and submission guidelines are available for all. Please visit www.emeraldinsight.com/authors for more information.

About Emerald www.emeraldinsight.com

Emerald is a global publisher linking research and practice to the benefit of society. The company manages a portfolio of more than 290 journals and over 2,350 books and book series volumes, as well as providing an extensive range of online products and additional customer resources and services.

Emerald is both COUNTER 4 and TRANSFER compliant. The organization is a partner of the Committee on Publication Ethics (COPE) and also works with Portico and the LOCKSS initiative for digital archive preservation.

*Related content and download information correct at time of download.



GERMAN DATABASES FOR NATIONAL AND INTERNATIONAL USERS, USING ENVIRONMENTAL DATABASES AS AN EXAMPLE

Kristina Voigt, Eleonore Poetzsch, Martina Reich, Thomas Schultz-Kruitisch and Engelbert Zass

1. Introduction to the German Language Session

Kristina Voigt, GSF Forschungszentrum für Umwelt und Gesundheit, PUC, Neuherberg

The German session (rather, the German language session) at the 18th International Online Conference in London, 6–8 December 1994, was on the subject of German or German language databases for national and international users. This subject is best shown using environmental sciences as an example.

The session was chaired by Kristina Voigt of the GSF-Research Centre for Environment and Health in Neuherberg near Munich, Germany. As both the panel members and the Chairman felt that their presentations should be made available to a wider audience, they all agreed to give extended abstracts of their contributions for publication in this international journal. This should not only give the German-speaking community, but also other international interested parties, the opportunity to be informed on the topics discussed.

The four invited panel members came from a variety of institutions (university, agency, host/database producer, management consultancy). Their names and institutions are given with their contributions, and we provide the complete list of addresses at the end of this paper.

A combination of policies in education, research and technology is the only possible strategy to improve the quality of life and standard of living in our society. Providing information is necessarily a central issue of all three areas of politics. Hence it follows that the information factor is of extremely high value. The following contributions, which are given by experts who have been working in the information sector for many years, do not just describe the state of the information product and information industry, but give valuable hints or conclusions for the future development and improvements of German information products. In close connection with this, it is recognised that not only should there be an internationalisation of German databases (English translations), but also that cooperation with international partners in this field has to be strengthened. An important topic is also better harmonisation among the disciplines concerned; for example information science, informatics, environmental sciences, chemistry, physics, mathematics, economics and so on. Furthermore, acceptance of the use of information has to be intensified by

teaching these topics at universities and specialised institutions of higher education.

Much work has still to be done towards the goal of being capable and recognised partners in the international information/database forum. Let us consider this paper as one small step into this direction.

2. German databases in biotechnology: problems of biotechnology information in Germany

Prof. Dr Eleonore Poetzsch, Fachhochschule Potsdam

2.1. Introduction

The availability of high quality, up to date and comprehensive information is an important requirement in biotechnology and its applications in the ever-widening fields of medicine, pharmacy, agriculture, food industry and the environmental sciences. Advances in biotechnology depend to an increasing extent on which required information is made available, and how it is used. The growing amount of data, especially from the genome projects, deliver an enormous number of sequence data, meaning that collecting, processing and disseminating these data is only possible with the help of modern information technology and international cooperation.

2.2. Problems of biotechnology information in Germany

- *Underestimation of the value of information*, which find its expression in an underdeveloped information awareness and a dangerous ignorance concerning the use of information, in an insufficient support for the production and maintenance of databases, and in a lack of reputation of biotechnology information as a science or as a part of a science.
- *Financing*. In the USA, there is substantial public funding in long-term programmes with the result that the USA plays the leading role in the production of databases, and there is a European dependency on American database producers. This can be seen from the high value of information in the frame of genome projects, which include large-scale projects combining mapping and sequencing with data collection and

distribution. In Germany, in contrast to the development in the USA, the necessary pre-conditions for the setting-up of biotechnology databases are insufficient. The biotechnology information projects supported by the 'Fachinformationsprogramm der Bundesregierung' (Specialised Information Programme of the German Government), *AuBit* and by the programme 'Biotechnologie 2000' (Biotechnology 2000), *BIKE*, *GENTEC* and *Microbial Activities* are disbanded. The Governmental Support Programme 'Molekulare Bioinformatik' (Molecular Bioinformatics) does not consider the creation and updating of databases.

- As a result, we have to say that *biotechnology has disappeared from the information landscape in Germany*. While the USA invests huge sums in the establishment of centres for biotechnology information, in the creation of large databases and software packages, and so forth, there are only a few, inadequate activities in Germany. We must ask ourselves: 'Who is responsible for the failures in regard to biotechnology information in Germany?'
 - *The information centres*, because they have not developed new products and new services;
 - *the information users*, because they were not able to use the wide variety of databases offered and to transfer the information offered into new knowledge;
 - *the information politicians*, because they were not able to create a lobby for the information, to use the opportunities presented by the reunification of both German states for the information sector, to promote the interfaces between research and information, and to ensure the existence of highly qualified databases;
 - *information science*, because it could not come to a synergy with informatics, could not find new contents according to the new requirements, and so on.
- The relation (disproportion) between *the quantitative aspect* (volume of data, e.g. the tremendous increase in genetic data) and *the qualitative aspect* (reliability of data with respect to their current relevance and accuracy; and interpretability of data with respect to their complexity, structure-function relationships, cause-effect relationships). The fact that the creation and updating of databases is a time-consuming and expensive process on the one hand, and the need to ensure the currency and coverage of the databases on the other, means that in many cases the quality of databases is decreased (the 'quick and dirty' principle).

2. 3. Conclusions for biotechnology information — not only for Germany

A. Creation of a new information consciousness and information behaviour. Supporting the development of a new attitude and relationship to information, and recognising that information is an absolutely necessary component of all activities in research and development, in industry, and in the public eye; but also to accept that information has its price.

B. Interdisciplinary cooperation. Recognising the interdisciplinary character of biotechnology, increased attention is being devoted to establishing a close interdisciplinary cooperation among all participants in research, industry, government and in public; and a broad linkage of biosciences and biotechnology with efficient informatics methods.

C. International cooperation. Proceeding from the fact that significant databases in the field of biotechnology can only be created through international cooperation, it is imperative that all countries work together. The enhancement of international cooperation with the purpose of increasing and coordinating information exchange; establishing international information centres for the collection, processing and exchange of data; and exploiting the opportunities of international networks being developed demands a number of activities.

D. Establishment of a European infrastructure of biotechnology information. Expansion of the European Bioinformatics Institute (EBI), or creation of a European Centre for Biotechnology Information that meets information needs which are not sequence linked; and European participation in the construction of international databases and improvement in the cooperation between western and eastern Europe.

E. Necessity of support and investment at German, European and international levels and from the government, industry and international organisations, with the aim of achieving a greater integration of national, European and international activities in the field of biotechnology information.

F. Further development of biological databases. The further development of biological databases via the application of informatics will be connected with the increased integration of biotechnology and information technologies; the development of advanced strategies for the handling of large volumes of data, integrated data and knowledge bases for various types of information; and a focus on the quality of databases.

G. Creation of educational opportunities. To promote bioinformatics and biotechnology information, special emphasis must be placed on the creation, extension and improvement of educational opportunities.

H. Improvements in information management and marketing for biotechnology information products. To define the characteristics of new products to improve the synergy between the public and private sector in the information market, and the scientific areas involved in biotechnology information.

I. Use of databases in biotechnology. With large databases we have a huge information potential at our disposal, but until now we have not been able to utilise it to a high degree. It is necessary to improve the use of databases for basic research (e.g. in genome research), applied research (e.g. for molecular modelling), technology transfer and improvement of innovations (e.g. to transfer research results in practical commercial

applications and to help to introduce innovative technologies to the market-place), coordination of national and international research programmes (e.g. for the avoidance of duplicate work), competition analysis (e.g. for information concerning the marketability of products), and improving the public perception of biotechnology (e.g. for the objective assessment of experiments in genetic engineering). The lack of public acceptance of biotechnology in Germany is also a result of the lack of information, since there is a direct link between information and attitude. Specific measures should be taken to enhance public perception, mostly through the availability of objective information.

The information highway exists *per se* in the form of a highly developed information infrastructure, and political changes have brought the advantage that we have no unbridgeable frontiers. The task of biotechnology is to draw a map, not only in genome research but also in the field of biotechnology information and bioinformatics with the aim of targeting the information highway. The combination of biotechnology and information technology is a challenge for both fields and should be a strategy for the future.

3. Environmental information in German business databases

Martina Reich, Roland Berger & Partner GmbH, International Management Consultants, Information Centre, München

3.1. Introduction

In 1993, the market for environmental technology in Germany achieved a total market volume of 62.5 billion marks, which exceeded turnover in plastics (59 billion) and steel (37 billion). With a 19% share of the total sales, amounting to a total market volume of 578 billion marks, Germany is the world leader in environmental technology.

In order to maintain the competitive edge in this industry of the future, it is necessary not just to guarantee Germany's transfer of technology and knowledge in this field, but to expand and improve it.

What contribution can German business databases make in this area? The following comments set out the various research possibilities available for company, market and industry data in the field of environmental technology and consulting.

3.2. Specialist areas of environmental technology

Environmental technology can be divided into the following groups:

- Noise prevention, noise reduction;
- Energy, energy saving;
- Air pollution;

- Soil conservation and treatment, waste treatment;
- Water, sewage and sludge treatment;
- Analysis, filter and purification techniques.

The problem with research in this area is that there are no standard definitions, so that expensive research with synonyms has to be carried out. Furthermore, this is a relatively young industry which in many areas cannot be assigned clear classifications.

Besides environmental technology, environmental services have to be taken into consideration:

- Waste management;
- Recycling;
- Environmental consulting.

Additional research problems arise in this area. Environmental services are not a clearly defined industry, since the companies producing environmental technology often offer consulting services too. A further problem is that, in general, modern services are difficult to classify in the existing classification systems.

What is more, environmental consulting is mainly in the area of small and medium-sized companies and consequently not documented in databases as well as large companies.

3.3. Analysis of environmental and business databases

An analysis of the international database offers a wide range of environmental themes:

<i>Specialist area</i>	<i>Number of databases</i>
Noise prevention, noise reduction	5
Energy, energy saving	70
Air pollution	20
Soil conservation and treatment, waste treatment	45
Water, sewage and sludge handling	50
Analysis, filter and purification techniques	> 100
Environmental services	not available

Company profiles and information about the competition for German companies in the environmental industry are stored in the following databases:

<i>General company databases</i>	<i>Sector-related company databases</i>
Creditreform	UTECH (Seibt)
Dun & Bradstreet	RECY
Hoppenstedt	VDMA
ABC-Deutschland	DETEQ
D&B European Financial Records	DBUM (Deutsche Bank)

As retrieval aids for these databases, SIC codes or other database-specific industry codes are available. The problems arising in the use of these classifications were mentioned above.

<i>General business newspapers</i>	<i>Full-text databases</i>	<i>Reference databases</i>
Handelsblatt	VDI-Nachrichten	ULIT
Wirtschaftswoche	KOBRA	FAKT
Süddeutsche Zeitung	Textline	BLISS
FAZ	PTSPrompt	FITT
taz, Berlin		IWUM

Market and industry information regarding environmental technology and consulting can be researched in the German press and other full-text databases shown above.

Retrieval aids are available in the index fields for companies, individuals and geographic areas, and so forth. Various kinds of indexing have to be taken into account during online research in the German language newspapers.

These are unfortunately not as simple, clearly arranged or uniform as the following table suggests:

<i>Title</i>	<i>Since</i>	<i>Coding</i>
FAZ	1993	CO, NN, SIC, CN, Facets
SZ	1993	CO, NN, SIC, CN, Event
FR	07/1994	None
taz	1988	CO, NN, Classification, Thesaurus
HB	1984	CO, NN
NZZ	1993	None
SHZ	1993	None
Kurier	1992	Descriptors
Presse	1991	Descriptors
Der Standard	1990	Descriptors
OOEN	1988	CO, Controlled Terms

(CO = Company, NN = Person, CN = Country, SIC = SIC-Code)

There are also complete market and industry studies about the German market for environmental technology in the international databases:

<i>Full text databases</i>	<i>Reference databases</i>
INVESTEXT	FINDEX
Frost & Sullivan Market Research	IMRI
FT Business Reports — Energy and Environment	Industry Trends & Analysis (ADL)
Freedonia Market Research	

These databases offer various controlled terms in the way of retrieval aids, albeit only in English.

In addition to the general press databases, political and legal policies — which play an important role in the development of the environmental sector — can be found in the following databases:

- DIW Wochenberichte;
- Ifo-LiteraturDatenbank;
- German Brief;
- URDB.

3. 4. Conclusions

Looking at this above information as a whole, it can be concluded that business information concerning German envi-

ronmental technology, far from being made accessible, has been hidden in German databases.

The lack of search terms in classification schemes, expensive synonym research which has to be repeated in at least two languages, coding which is not universal in the full text databases, and a wide dispersal of information in different databases make the research for environmental information both time-consuming and consequently cost intensive.

3. 5. Suggested reading

- Goebel, R. (1994) German language newspapers as online sources for business information, *Proceedings Online Information 94*, Learned Information, Oxford, pp. 637–648.
- Koch, H. (1995) *Umweltdatenbanken bei STN International und ihre Nutzung in der Praxis* (publ. pending).
- Schulte-Hillen Scientific Consulting (Ed.) (1994) *Handbuch der Wirtschaftsdatenbanken*, Hoppenstedt, Darmstadt.
- Wettbewerb (1994) Versaute Chancen, in *Wirtschaftswoche*, 38, pp.108 ff.

4. Internationalisation of the databases of the German Federal Environmental Protection Agency (Umweltbundesamt Berlin)

Dr Thomas Schultz-Kruisch, Umweltbundesamt Berlin

The German Federal Environmental Agency (Umweltbundesamt Berlin) is a scientific authority under the legal control of the Federal Ministry for Environment, Nature Conservation and Nuclear Safety. The basis for the work of the agency is a law of 1974, in which the establishment of a central documentation information system for environmental topics and the coordination of environmental research were defined as main tasks.

The Federal Environmental Agency fulfils these tasks in setting up and updating several databases. Three databases will be described here as examples. These databases are also offered on several online hosts.

4. 1. ULIDAT (Umweltliteraturdatenbank)

This bibliographic environmental literature database ULIDAT, (Umweltliteraturdatenbank) or ULIT, currently contains approximately 230 000 documents covering the following subjects: water, air, soil, nature and landscape, chemicals and dangerous substances, waste, law and regulation, energy and raw materials, agriculture and forestry, environmental economics, politics, noise, radiation, genetic engineering, ecology, social science in connection with environmental questions, and environmental informatics. Eighty per cent of the literature is in the original German language, 20% is in English. The evaluation of the documents is done using an environmental classification system, the German en-

vironmental thesaurus, and German (in special cases English) abstracts. Both the environmental classification system and the environmental thesaurus are developed and updated by the Federal Environment Agency. The titles of the documents are translated into English. Regarding sources and evaluation, the ULIDAT database is a German-language database.

4. 2. UFORDAT (*Umweltforschungsdatenbank*)

The UFORDAT (*Umweltforschungsdatenbank*) or UFOR environmental research projects database currently contains approximately 34 000 documents; that is to say, completed and running research projects of those environmental subjects named above. On top of that UFOR contains entries on approximately 9000 environmental institutions in Germany, Austria and Switzerland. The information on the research projects as well as on the institutions is given by the authorities which are promoting the research projects, or is taken from questionnaires. For the description of the contents of the documents, the environmental classification system and the environmental thesaurus are also used (see ULIDAT). Abstracts about the results and aims of the research projects are given in German. The titles of the projects are also translated into English. The UFORDAT database covers the German-speaking countries and can only be searched in German.

4. 3. URDB (*Umweltrechtsdatenbanken*)

The environmental laws and regulations database URDB (*Umweltrechtsdatenbanken*) currently contains approximately 16 000 documents on international, EEC and German environmental laws and regulations, and on legal decisions of German courts and of the European Court. Sources for this law and regulation database are official gazettes, ministerial publications and so forth of Germany and its federal states, as well as scientific journals. As this database only covers laws, regulations and judgements which are relevant for Germany, the evaluation of the content is done using the German environmental classification system and the environmental thesaurus mentioned above.

4. 4. *Availability of these databases and future developments*

Users of these environmental databases produced by the Federal Environment Agency are above all companies, research institutes, libraries and authorities in German-speaking countries. Nevertheless we are of the opinion that the know-how stored in these databases should be of great interest to the international economic and scientific community as well. In order to make the knowledge contained in these databases available to international users, a great effort has to be made by the producer of these databases to fulfil this task. The biggest barrier in this respect is the restriction to the German language regarding the evaluation of the documents. The translation of the thesaurus terms, classification system and abstracts alone does not overcome the language barriers of the

original publications. However, the producer thinks that the expenditure of translating relevant documents is justified for the user, if a citation or document of a research project is of high enough importance.

The environmental thesaurus and classification system has already been transferred into English. The English terms will be implemented after a conscientious validation of the translation.

The databases ULIDAT, UFORDAT and URDB are made publicly available via the online hosts DataStar, STN International, FIZ-Technik, GENIOS, GBF and Juris. An extension of the usage via more international hosts seems to be reasonable. Making the databases available via Internet and the production of a CDROM are currently being considered by the producer. A CDROM version of the databases will most probably be published in the first half of 1995. Parts of UFORDAT could be made available on the Internet at the beginning of 1996.

The aim of the German policy for information and documentation has so far been to support the utilisation of international databases for German-speaking countries, and to support several national database projects. One of the aims of the second half of the nineties should be to make the knowledge and contents of German databases available to international users as well.

5. German databases in the chemistry curriculum at the ETH Zürich

Dr Engelbert Zass, ETH Zürich

5. 1. *History of education in chemical information*

At the ETH Zürich Chemistry Department, we started online searching in 1979 on the host DIALOG, and later got access to ORBIT, CIS (1980), CAS Online (now STN, 1981), and DataStar (1982). In 1985, we installed the in-house reaction database systems REACCS, SYNLIB and ORAC. Those systems were (and still are) not only more user-friendly than public online databases, but also do not incur usage-dependent cost. With increased usage and variety of databases, the need for training also increased. This was first fulfilled through courses given by the hosts. Such courses, while indispensable in the beginning to train a core staff of searchers, were soon found to be too expensive for training a large number of users, and not ideally suited for our specific needs. Consequently, we had already begun teaching our own courses in 1981. Although difficulties with the actual search process (logging in, search commands etc.) loomed large in the beginning, these rapidly appeared as minor problems compared to the difficulties in constructing good search profiles for the databases at hand. For that, formal education in chemical information retrieval rather than training is necessary. This began at our department in 1984 with a one-hour per week, two-term (one year) course in chemical information for graduate students, focusing on electronic sources. Since 1990, this has been supplemented by practice sessions where students bring their own questions to be solved, and by special courses for the in-house

systems mentioned above. Presently, we are about to take care of the information needs of undergraduate students by instructing them regularly in the use of printed sources and CDROMs (for cost reasons, our undergraduates do not have access to public databases on a routine basis). The number of chemistry departments offering formal instruction in chemical information retrieval is rather small in Germany. This personal observation is corroborated by the fact that in 1994, the German Ministry for Research and Technology (BMFT) considered it necessary to start a large project called 'End-user support in chemistry' (Endnutzerfoerderung in der Chemie), with the goal of promoting use of German chemistry databases and instruction in information retrieval at all German chemistry departments.

Lack of information consciousness (and cost awareness in this context) due to lack of appropriate education is certainly an important factor in the observed lower usage of databases in Europe. There are also other causes: insufficient user friendliness and database quality, as well as training and marketing that is too much database-oriented and not sufficiently oriented to problem-solving.

5. 2. Problem-oriented information in Beilstein and CA

Let us take the German database Beilstein as an example. This is an important source for information on organic compounds, but it seems to be significantly under-used with respect to the databases produced by the Chemical Abstracts Service. The coverage of these databases starts in 1957 for chemical compounds (structures), and in 1967 for literature (the CAOLD file covering 1957-66 is not considered a real literature database for lack of content and search facilities), with weekly and biweekly updates, respectively. Chemical Abstracts (CA) is undoubtedly an indispensable source for the most recent information (Beilstein's coverage currently extends only to 1993), for compound classes (polymers, organometallic compounds) and primary publications not covered by Beilstein. Conversely, Beilstein is indispensable for anything prior to 1957, as its coverage starts as early as 1789. All this can easily be inferred from the respective database producer's documentation.

What users cannot learn, however, from the documentation is more problem-oriented information about the suitability of CA versus Beilstein. Obviously, both producers cannot be expected to compare their own database to that of their competitor, but hosts like STN that offer both databases could and should do this in a fair way to assist users. We had to do analyses of searches and database content ourselves, for lack of really useful guidance in selecting either CA or Beilstein, or both, depending on the type of question asked. This showed us that for comprehensive information on organic compounds, even after 1967 (where on paper CA alone might seem sufficient), you have to search both CA and Beilstein: for the terpene gammaceran-3,21-dione, for example, we found one record in the STN Registry File, and one literature reference each in the CA (1980) and CAOLD (1958) files. In Beilstein, we retrieved two compound records with two references. One

of those was identical to the 1958 one in CAOLD, the other from 1966 was unique to Beilstein. That is, both CA and Beilstein missed one reference each that they should have covered! We found a number of similar examples, and analysis of the respective primary literature showed that those omissions are not always simple errors, but quite often reflect different coverage and selection policies.

Such differences are very important in a CA/Beilstein comparison concerning retrieval of data about organic compounds. Here Beilstein has a clear-cut advantage over CA. Many users seem not to know that CA does not contain indexing of 'routine' data (as opposed to physical data that are particularly emphasised in the primary literature), and almost no numeric values. Beilstein, however, includes both as its mainstay of information. We found no quantitative examples for this, so again we had to do our own database examination: for 343 hexopyranoses indexed by both CA and Beilstein with references since 1967, we found the following data reported by CA/Beilstein: preparation, 46%/47%; melting points, 0%/26.5%; optical rotation, 3%/30%; nmr data, 32%/59.5%. Knowledge about coverage of data is one important aspect; searchability is another. Let us take a search for nmr data as an example: in CA, one is obliged to use the profile 'nmr or resonance' to include records that were indexed with the acronym as well as those with the full phrase 'nuclear magnetic resonance', both being used in a non-systematic way for indexing. Users do not understand — and really should not accept — why indexing is not more consistent, and if it cannot be in the first place, why such synonymous descriptions are not either automatically cross-referenced or replaced by a standard form in the database. There is a related problem also in Beilstein: here, nmr data can appear in the fields 'NMRS' (nmr spectrum), 'NMRA' (nmr adsorption), 'CTNMR' (controlled terms nmr) or in 'CTUNCH' (controlled terms unchecked, for the time period 1960-79 only). This differentiation may be useful in special cases but it also implies that in the far more common case when all information about nmr is wanted, each of these fields must be searched. The Beilstein CDROM *Current Facts* solves this problem in the only acceptable way by offering, in addition to the individual fields, a superfield 'nmr' which includes all of them. Unfortunately, this feature is at present still lacking in the public online database, and, to make matters worse, the Beilstein manuals do not sufficiently attract the user's attention to this problem. This means that it is all too easy in both Beilstein and CA to miss relevant information which they contain.

5. 3. Conclusions

Practical information of that type is essential for selecting databases and search strategies, but not sufficiently available at present in marketing brochures, manuals or courses. This is not just a major problem for German databases. We cannot expect widespread routine use of databases by chemists when they are not properly informed about the strengths and weaknesses of particular sources for particular questions, especially if searching might imply use of several databases with concomitant increase in effort and costs. With insufficient

knowledge, users can only be expected to behave as a lot of them still do, i.e. favouring the US databases they are more used to (because they normally appeared on the market much earlier) over German or European databases of more recent vintage.

6. Authors' addresses

Kristina Voigt
GSF-Research Centre for Environment and Health
Ingolstaedter Landstrasse 1
85758 Neuherberg
Germany
Tel: +49 (089) 3187 4029
Fax: +49 (089) 3187 3369
E-mail: voigt@wiz.uni-kassel.de

Prof. Dr Eleonore Poetzsch
Fachhochschule Potsdam (formerly FIZ Chemie, Berlin)
Fachbereich Archiv-Bibliothek-Dokumentation
Friedrich-Ebert-Strasse 4
14467 Potsdam
Germany
Tel: +49 (0331) 2884 205
Fax: +49 (0331) 2884 222

Martina Reich
Information Centre
Roland Berger & Partner GmbH
International Management Consultants
Arabellastrasse 33
81925 München
Germany
Tel: +49 (089) 9223 507
Fax: +49 (089) 9223 385

Dr Thomas Schultz-Krutisch
Umweltbundesamt
Z 3.5
Bismarckplatz 1
14193 Berlin
Tel: +49 (030) 8903 2631
Fax: +49 (030) 8903 2285

Dr Engelbert Zass
ETH Zürich
Chemie-Bibliothek
Universitaetstrasse 16
8092 Zürich
Switzerland
Tel: +41 (1) 632 2964
Fax: +41 (1) 632 1072
E-mail: kraeutler@ezrzi.vmsmail.ethz.ch

This article has been cited by:

1. Bernd Page Bernd Page is a Professor in the Department of Computer Science, University of Hamburg, Germany. Kristina Voigt Kristina Voigt is Senior Scientist at the GSF National Research Centre for Environment and Health, Institute of Biomathematics and Biometry, Neuherberg, Germany.. 2003. Recent history and development of environmental information systems and databases in Germany. *Online Information Review* **27**:1, 37-50. [[Abstract](#)] [[Full Text](#)] [[PDF](#)]
2. Kristina Voigt Johann Gasteiger Wolf-D. Ihlenfeldt Bernd Page Kurt Specht Walther Umstätter. 1996. GERMAN EXPERTS' VIEWS AND IDEAS ABOUT INFORMATION ON THE INTERNET. *Online and CD-Rom Review* **20**:3, 125-132. [[Abstract](#)] [[PDF](#)]