Gesellschaft für Anlagen-
und Reaktorsicherheit
(GRS) mbH

WINRE `93

4th Workshop on Information Management in Nuclear Safety, Radiation Protection, and Environmental Protection

GRS - 105

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4th Workshop on Information Management in Nuclear Safety, Radiation Protection, and Environmental Protection

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CONTENTS

SESSION 3 Information Management Products

WELCOMING

H.-P. Butz
Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) mbH, Köln

Ladies and gentlemen, good afternoon!

Welcome on behalf of Gesellschaft für Anlagen- and Reaktorsicherheit to our fourth "Workshop on Information Management in Nuclear Safety, Radiation Protection and Environmental Protection". Thank you all for coming to Cologne to take part in this event. This year we are delighted to have guests from 14 countries, namely from Belorussia and Bulgaria, from the Czech Republic, Estonia and Germany, from Hungary, Latvia, Lithuania and Rumania, from Russia, the Slowak Republic, Switzerland and the Ukraine, and, for the first time, also from the United States of America.

The fact that we are holding this event for the fourth time shows that the exchange of information in this field has become an indispensable part of our work. We should all remember that the exchange of information between our countries used to be rather difficult. The continuity of this workshop is an encouraging sign of the increasing co-operation in the issues relating to the topics of this meeting.

As on the three previous occasions, Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) has once again prepared and organised this workshop on behalf of the Federal Minister for the Environment, Nature Conservation and Nuclear Safety, or short: the BMU. At this point I would like to take the opportunity to thank the BMU for his support.

It is the objective of the workshop to clarify the various fields of application of international co-operation in the field of information management. The fast provision of factual and organisational information available throughout the world is an important basis for international projects, for science, as well as for politics, economy and management issues.

This year, the workshop puts much emphasis on the exchange of experience with experts from the Central and Eastern European countries. The representatives from the various countries and organisations that are here with us today are going to introduce their respective activities. I hope that what we are going to hear and see will give us all a qualified and comprehensive insight into the state of the art of information-management technologies in the specialist fields of nuclear safety, radiation protection, and environmental protection. Our exchange of experience over the next few days should also contribute to the promotion of the transfer of know-how between experts throughout the whole of Europe.

Session I

Perspectives

Chairman: K.-A. Höpfner

Fachinformationspolitik in der Bundesrepublik
- Status und Perspektiven -

V. Schubert
Projektträger Fachinformation, GMD-PTF, Darmstadt

Fachinformationsförderung in der Bundesrepublik

1974 - 1977	IuD-Programm der Bundesregierung (FIZ-Konzept)
1982-1984	Leistungsplan Fachinformation (BMFT)
1983	Evaluierung des IuD-Programms (Gutachten des Präsidenten des Rechnungshofes)
1984	Neuorientierung der Fachinformationspolitik der Bundesregierung
1985	Fachinformationsprogramm der Bundesregierung 1985-1988
1986	Vorlage der Zwischenbilanz 1986 zum FI-Programm
1990	Evaluationsstudie zum FI-Programm 85-88 (»Kienbaum-Studie«) GEWIPLAN-Studie »Nutzung elektronischer Fachinformation in Hochschulen«
1990	Fachinformationsprogramm der Bundesregierung 1990-94
1993	Zwischenbilanz 1992 zum FI-Programm der Bundesregierung 1990-94
...	Evaluation
...	WTI-2000 Konzept

WTI-2000 (wissenschaftlich-techische Information)

- Endnutzerförderung
  "Der Endnutzer recherchiert selbst von seinem Arbeitsplatz aus. Er bewertet die Ergebnisse und verwertet sie für seine eigene wissenschaftliche Arbeit, deren Ergebnisse er
  - elektronisch - publiziert"

- Elektronisches Publizieren
  Autorenkonzepte bevorzugt vor Distributionskonzepten

- Intelligente Werkzeuge zur Nutzung von Faktendatenbanken
  Datenprognose Simulation Modellierung

Elektronische Fachinformation in der Bundesrepublik (1)

Finanzierungsrahmen (in MioDM)

Ausgaben für TV-Werbung 1992

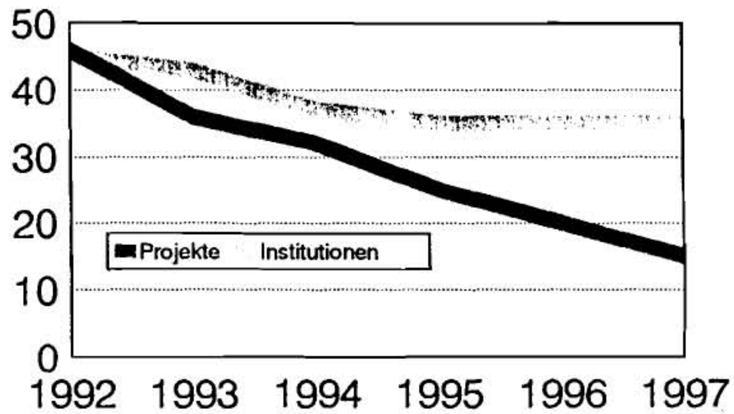
1. McDonald's, Restaurants	52,6
2. Fairy Ultra, Spülmittel	42,9
3. Ariel Color, Waschpulver	41,6
4. Jacobs Café Krönung	40,1
5. Nintendo, Video-Spiele	30,7
C&A Brenninkmeyer, Textil	30,7

Bundeshaushaltsplan 1992 (EP30)

Projektförderung FI	46,2
Institutionelle Förderung FI	38,9

(beides einschließl. Investitionen)

Mittelfristige Finanzplanung für FI



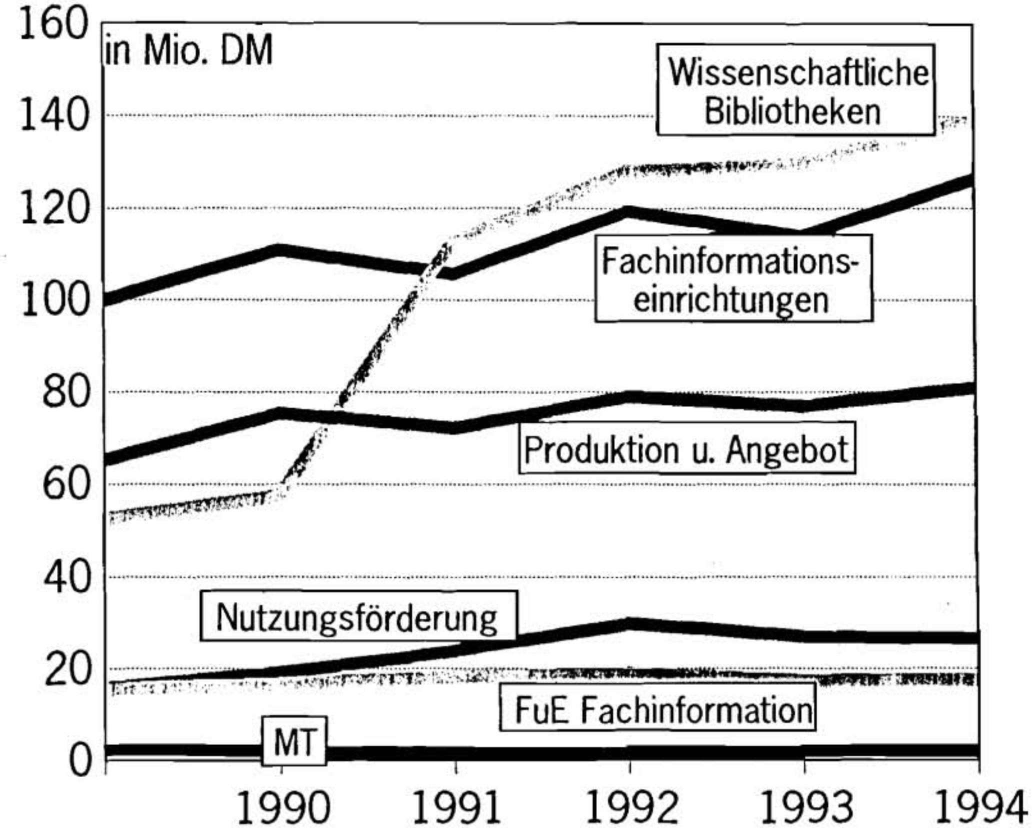
Quelle: FOCUS 30(1993); Bundeshaushaltsplan 1992

Elektronische Fachinformation in der Bundesrepublik (2)

- Für Fernsehwerbung geben 1800 Marken in 1992 ca 6,1 MrdDM aus.
- Die Werbeeinnahmen des privaten Fernsehsenders RTL betragen 1992 ca. 2 MrdDM
- Der gesamte FI-Markt (einschließlich der Kapital-Informationsdienste) in der Bundesrepublik beträgt rd. 1 MrdDM

Quelle: FOCUS 30 (1993); Password

Aufwendungen der Bundesregierung für die Schwerpunkte der Fachinformationspolitik 1989-94

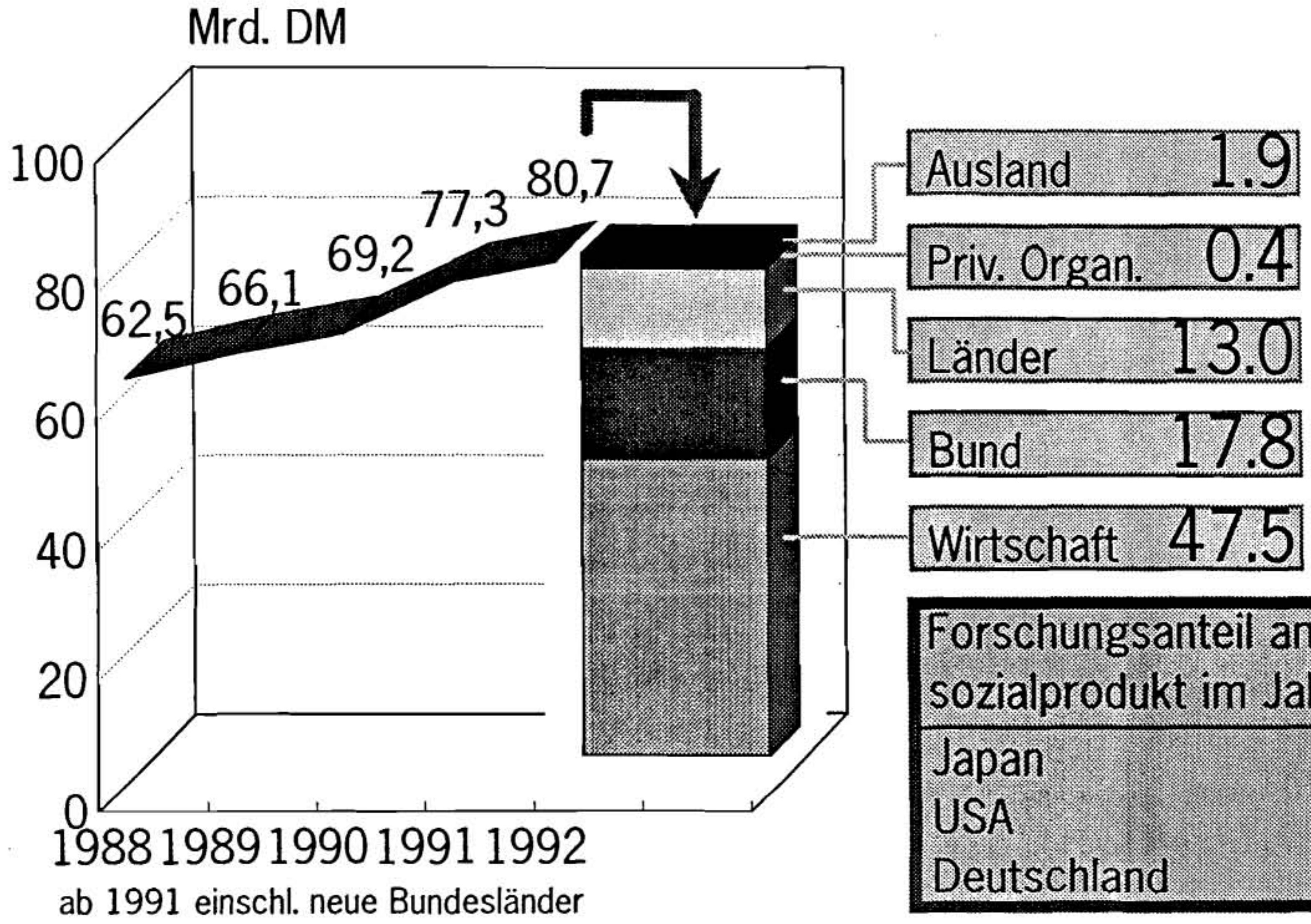


Quelle: Zwischenbilanz Fachinformation 1992

Forschungshaushalt 1994/1995

- 1994/95 keine Steigerung im Haushalt. Der Haushalt wird überrollt (Haushalts-Ausschuß)
- Verstärkte Klammerung von Projektförderung und institutioneller Förderung
- Anteil der institutionellen Förderung steigt (NBL-Institute)
- Grundlagenforschung wird erhalten, aber nicht gesteigert
- trotz Überrollung schwimmt die Forschungsförderung auf einer wohlwollenden Welle (BDI, Gewerkschaften etc.)

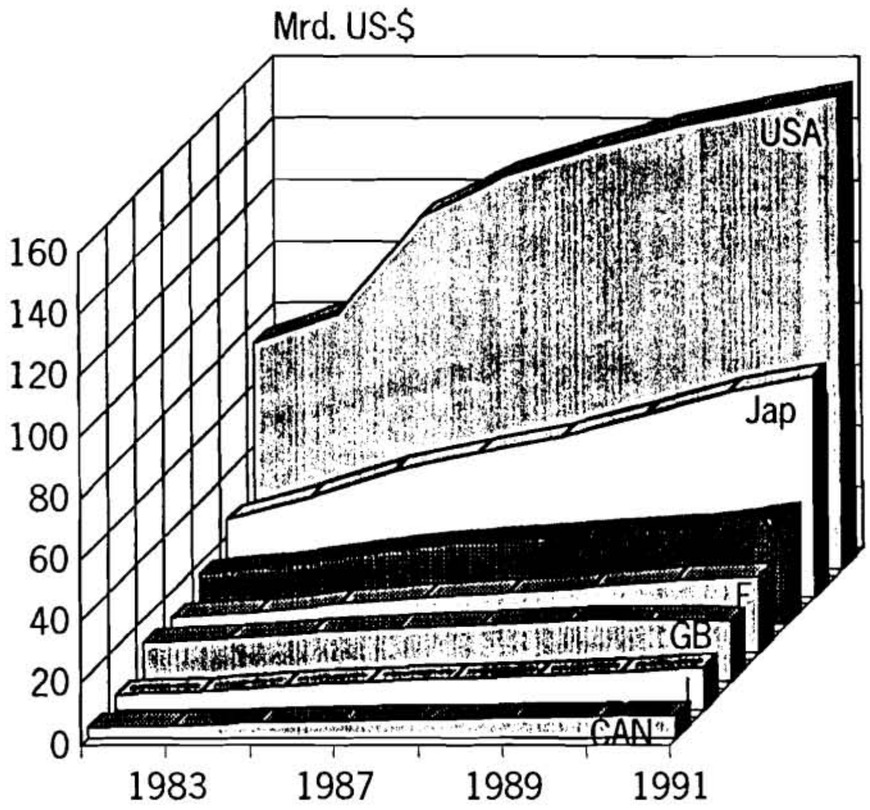
Forschungs- und Entwicklungsausgaben in der Bundesrepublik



Forschungsanteil am Bruttosozialprodukt im Jahr 1991	
Japan	3.0 %
USA	2.8 %
Deutschland	2.7 %

Quelle: BMFT

Bruttoinlandsausgaben für FuE in ausgewählten Staaten



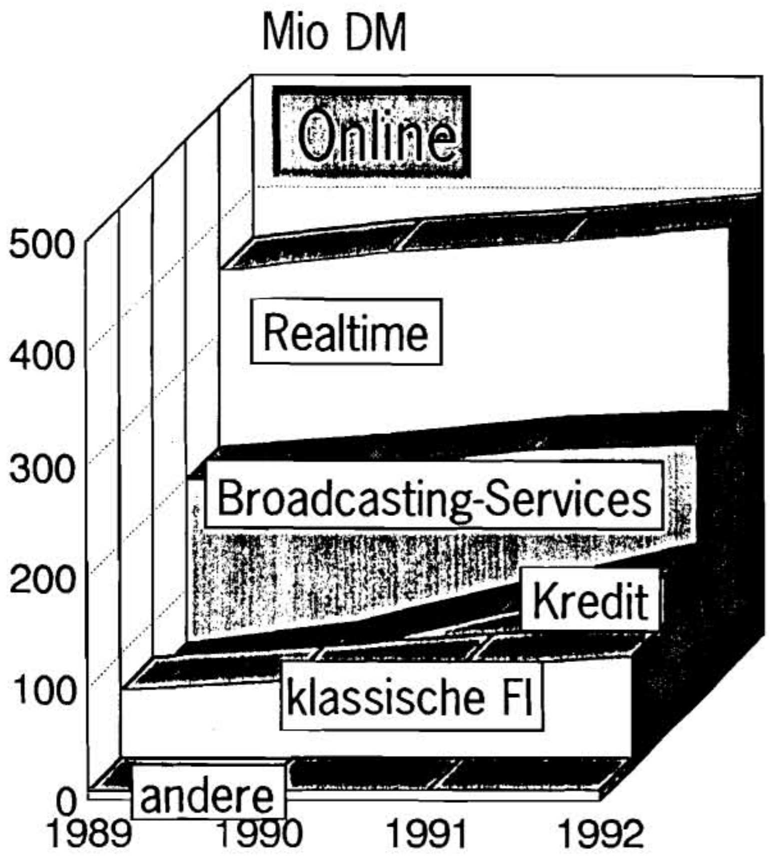
Quelle: BuFo '93 und OECD

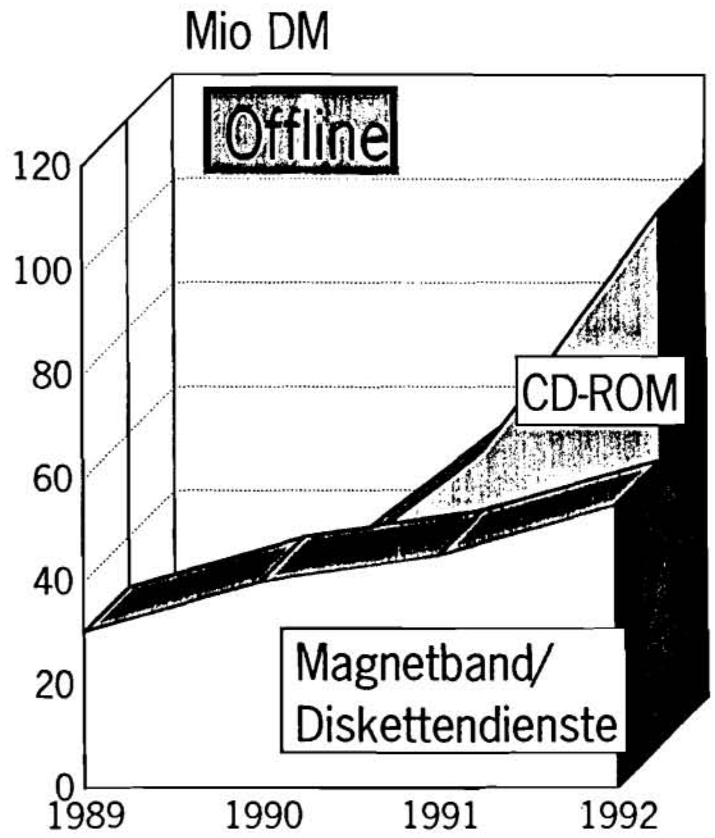
Die Entwicklung neuer Medien im Konsumerbereich

wird geprägt durch:

- die Einführung des Digitalen Fernsehens
- die multimediale technische Integration (Digitale, audiovisuelle, rechnergesteuerte Medienmaschinen)
- ISDN bzw. in der Folge Hochgeschwindigkeitsnetze (Glasfaser)
- zunehmende Individualisierung von Dienstleistungen auf Netzen und Sateliten
  - Digitales Telefon
  - Pay-TV
  - BTX-Dienstleistung via TV

Deutscher Markt für elektronische Informationsdienste





Quelle: PASSWORD

Elektronisches Publizieren in Ansätzen in der Bundesrepublik

Konsortialprojekt Elektronisches Publizieren

(1983-1987; Volumen 2.6 MioDM)

BEILSTEIN EFG (AUTOGESTALT)

gibt wg. 1:1 Abbildbarkeit von Handbuch und Datenbank
nicht viel her

GMELIN EHE-Projekt (Autoren-Ansatz)

SGML-Konzept (mehrfach-Verwertbarkeit der Quellen)
Verbindung zwischen Kontext und Daten
Grafik-Einbindung (schwach)

Online Publishing von Kristallstrukturen (Autoren-Ansatz)

Projekt mit dem größten Innovationspotential in diesem Bereich.
Ansatz übertragbar auf andere Bereich, die mehr oder weniger strukturierbare Informationen liefern (Spektroskopie, Reaktionen etc)

Elektronisches Publizieren in den USA (1)

TULIP-Projekt
[The University LIcensing Program]

Beginn: 3/1991

Ziel: Bereitstellung von 42 Elsevier-Journalen im US-Hochgeschwindigkeitsnetz INTERNET als:

- TIFF-Files (bit-mapped images)
- editierte Titel und bibliographische Angaben einschließlich der Abstracts
- zur Textsuche OCR-Volltexte (unkorrigiert, nicht für Display

für später geplant: SGML-Erfassung und -Bereitstellung

Besondere finanzielle Konditionen für die Nutzung

Elektronisches Publizieren in den USA (2)

CORE-Projekt

[Chemistry Online Retrieval Experiment]

Ziel: Bereitstellung der letzten 10 Jahrgänge von 20 ACS-Journalen aus dem Bereich der Chemie.

- ► SGML-strukturierte Texte
- ► durchdachte Benutzeroberfläch
- ► Integration von Graphik
- ► Integration von tabellarischen Darstellungen

Gemeinschaftsprojekt zwischen ACS, Online Computer Library Center (OCLC), Bell, Cornell University (an eine Ausweitung auf meherer hundert Journaljahre ist gedacht)

Datenkrise (1)

- 500.000 neue chemische Strukturen/Jahr
- 600.000 Publikationen/Jahr im Bereich der Chemie

Die Verfügbarkeit von Daten ist überwiegend mangelhaft, weil:

- sie nicht vorhanden (unbekannt) oder nicht publiziert sind.
- sie nicht, oder noch nicht, in Datenbanken aufgenommen wurden.

Wir sind ohne Chance, jemals den Bedarf nach Daten durch »konservative« Fakten-Datenbanken zu befriedigen.

Datenkrise (2)

Antwort eines »konservativen« Informationssystems/Datenbank auf eine eng definierte Anfrage:

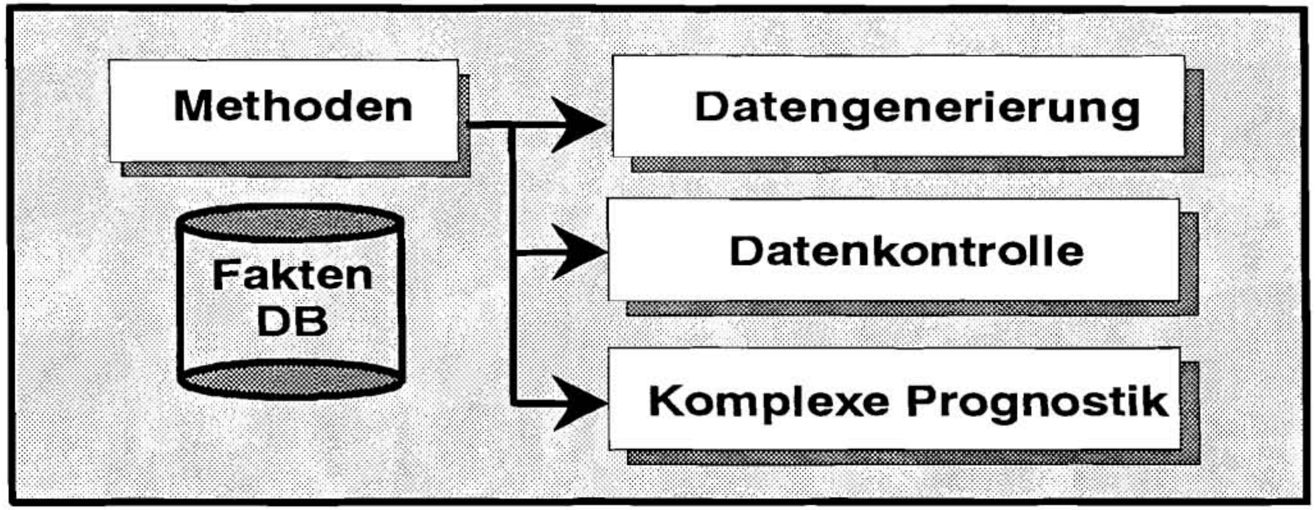
»Das weiß ich nicht«

besser:

»Das nachgefragte Datum ist mir nicht bekannt. Aufgrund meiner Kenntnisse über viele ähnliche Stoffe kann ich den Siedepunkt zu
[117+/-5] C
abschätzen.
Für diese Prognose habe ich folgende Hilfsmittel benutzt:
- Zustandsgleichung nach Benedic-Webb-Ruby
- verifiziert mit 123 Stoffen ähnlicher Struktur
Der Schätzfehler beträgt max. 5%«.

Datenkrise (3)

These: unsere »konservativen« Informationssysteme/Datenbanken sind vergleichbar einem zerschnittenen, alphabetisch sortierten Periodensystem.



wir erfahren z.B: ob und in welcher Weise eine reale/hypothetische Substanz:
o umweltproblematisch
o biologisch aktiv
o pharmakologisch wirksam (drug-design, molecular modelling)
o physikalisch-chemische Eigenschaftsspektrum
o ...

SVJPS, Red Sage and RightPages

A. de Kemp
Springer-Verlag, Heidelberg

SVPJS is the **Springer Journals Preview Service**, launched in February 1993 as the first service of its kind on the Internet. Following the request of many scientists, information specialities and libraries for earlier information on new journal articles, Springer chose 30 medical journals for a test. SVJPS offers the electronic tables of contents (TOCs) and BiblioAbstracts, including keywords, before publication at the same time announcing the despatch date. By the end of 1993 the number of journals will be increased to approximately 85 titles.

The **Red Sage Project** is considered to be the cutting edge of electonic journal delivery. It was started in February 1993 as a joint project of the University of California in San Francisco (UCSF), AT&T Bell Laboratories in Murray Hill, NJ and Springer-Verlag New York, Inc. to study the legal, technical and buisness issues surrounding electronic document delivery.The project started with 30 biomedical journals from Springer-Verlag, chosen for the representation of x-ray images over the network. Other publishers are now joining: the New England Journal of Medicine, Wiley, the American Medical Association and the British Medical Journal were mentioned at a press conference during the 1993 Frankfurt Book Fair.

The Red Sage Project is using **RightPages** information delivery system developed by AT&T Bell Laboratories. The RIGHT pages are the ones of interest to individual scientists, while the RIGHT form ist the page representation as originally created by the publisher, complete with graphics, thus guaranteeing authentication, integrity and security. RightPages automatically alerts users by electronic mail when articles are published that match their individual interest profiles. User can access the relevant articles via their desk top computers, view and browse them in the original perform, perform full text searching and make paper copies on their laser printers. RightPages also support retrospective searches and the next version conforms to ANSI Standard Z39.50.

At the 1993 Frankfurt Book Fair it was announced in a well attended press conference that RightPages software will be commercially tested in Europe as well. Springer-Verlag Heidelberg will coordinate requests for test sites and provide market support.

For further information please contact me at fax number +49-6221-487288.

Information Management Trends in the United States: 1993

B. Sandore
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1. Introduction

Libraries and information providers in the United States have quickly assilimilated technology into information services. Current trends in the U.S. information management can be organized into four categories, in order of importance:

1. Networking
2. Document Handling and Delivery
3. Graphical User Interface Development
4. Standards Implementation

A brief overview of current technology development in these four areas was provided in this presentation, with descriptions of groups involved in development, the type of information, the methods of acess, and the tools used.

2. Networking

The initial partners in the development of the Internet in the 1970's were government agencies and advanced researchers. Use of the Internet not only as research tool, but also as a common vehicle for communication and finding information, is now widespread in the U.S. academic, research, and government communities. Work is under way to establish the NREN (National Research and Education Network), with the hope that NREN will support the interests and needs of many groups. Buisnesses have established links to the Internet using commercial communication providers such as MCI. Public non-academic groups, such as public libraries, and community school systems are also organizing access to Internet resources either by cooperation with academic institutions, or by organizing their own access through community or regionally operated networks (e.g., Freenet-Cleveland, Ohio).

Literally hundreds of types of information can be found by navigating the Internet, including city, state and national governmental laws and decisions, organizational directories, news and wire services, over 2,000 interest groups on every imaginable subject, weather maps and forecasts, research directories, library collections, full-text, numeric, and image databases. [1] Serveral software tools now exist that can help one find some, if not all, of this information, including:

- **Gopher** (public domain software, developed at the University of Minnesota)
- **WAIS** (Wide Area Information Servers)
- **WWW** (World Wide Web, developed by CERN).

CIWIS - Campus-Wide Information Services (also community information service)

Essentially these software programs are operating on the concept of the client/server model, which consist of menus offering various categories of information (e.g. »Current Events«, »Employment Opportunities«), with pointers to the Internet addresses of each database, both local and remotely-accessible resources. The Web provides information in a Hypertext environment. These categories can be customized by each institution using the software. [2] Further development of these information utilities is enhanced by the organizations that use this software. Enhancements made by one institution can be shared in new releases if they are deemed to be of benefit to a majority of the users. Various client software programs have been developed by so that a variety of computers can communicate with these server software programs.

Libraries and information centers are developing an active interest in this information, some of which was once considered ephemeral, or was given low priority, especially in the research environment. However, our awareness has once again been raised by end-users who, preferring quick and convenient access to information, can search the world of information from their homes and offices. The Internet has had the effect of leveling access across economic and social sectors, making it equally valid for a scholar to make airline reservations one minute, and to execute a complex research program the next, all from the same workstation.

Numerous organisations have sprung up that support and shape the development of the Internet, including EDUCOM, CAUSE, and the Coalition for Network Information. Their membership normally comprises academic, library, vendor, and not-for-profit interests.

3. Document Handling and Delivery

The second important trend in U.S. information managemnt is the electronic provision of information that is normally used in printed format. Four areas of development can be identified:

- Document delivery
- Journal citation and abstract databases
- Full-text databases (ASCII)
- Image processing and text transmission

Emphasis is placed on speed and the provision of electronic screen images that are as near as possible to the real print resource. Tools used to accomplish the delivery of this information include fax, scanning, and the Internet.

Two examples of electronic document delivery projects now in full production in the United States include the ARIEL project, conceived and developed by the Research Libraries Group, and CARL UnCover 2, developed by the Colorado Alliance of Research Libraries. The ARIEL project involves the use of scanning journal publications and transmitting computer files of the scanned images of these pages across the Internet to the fax machines of participating libraries. Use of ARIEL is growing among research libraries in both the United States and Canada. CARL UnCover 2 is an offshoot of the CARL UnCover journal citation and table of contents database. Users of the CARL UnCover database can order a document online, using a credit card for paymant. CARL personnel scan the documents in the holding libraries in Colorado and elsewhere, and the files are sent to the fax machine of the requestor or the library. Both ARIEL and the CARL UnCover 2 projects use the Internet for the file transfer.

Another development that has changed the way users find journal citations is the electronic journal citation, abstract, and table of contents database. Numerous commercial vendors now offer online or CD-ROM acess to these databases, including CARL, BRS (Bibliographic Retrieval Service), DIALOG, and OCLC. From the point of view of users, perhaps the most innovative of these services is OCLC's First Search service, which enables a user to search numerous commercial citation databases, as well as the OCLC Union Catalog, all with a user-friendly interface and simple menus. OCLC is marketing this service directly to end-users, which in many cases could is a signal of the decreasing reliance of users on libraries for mediation with electronic bibliographic resources.

These services are accessible in a number of ways: through CD-ROM subscriptions, through lease, as locally-mounted databases at the leasing institution, or through the Internet or a few through services like CompuServ.

The net area of development involves the reprensentation of full-text, and full-text files with graphics. While these developments initially moved in two directions, they are likely to converge due to technological breakthroughs in handling both ASCII text and bit-mapped images and text.

There are numerous examples of full-text file projects in the United States. [3] Project Gutenberg in Illinois is an example of the simplest use of technology, where plain ASCII text files of public domain books, such as *Alice in Wonderland*, *Moby Dick*, *The Bible*, and *Roget's Thesaurus*, are stored in files and can be transferred across the Internet by means of a common file transfer protocol. [4] The ARTFL textual database (American and French Research on the Treasury of the French Language), was a joint development established in 1981 by the Centre National de la Recherche Scientifique and the Univesity of Chicago. ARTFL contains almost the complete texts of works by French authors such as Moliere, Diderot, Voltaire Balzac, and Zola. [5] A number of U.S. research libraries are currently developing electronic text research centers for humanities and other scholars. [6]

In the area of combined text and image reprensentation, serveral projects are currently under development, including a the Red Sage project, involving collaboration between AT & T Bell Laboratories, Springer Verlag, and the University of California. This project employs the prototype RightPages image-based electronic library system. [7] Other projects either completed or under development in the U.S. include CORE (Chemistry On-line Retrieval Experiment), a collaborative effort between Cornell University, the American Chemical Society, Bellcore, and OCLC. In this project, both text and graphics from ACS journals are stored and searchable for users. Rensselaer Polytechnic Institute and IBM have recently collaborated to develop a prototype document image system for technical journals using IEE and IEEE sample publications. [8]

4. Graphical User Interface Development: One-Stop Shopping

There is a convergence between the developments in text handling and interface development, so many of the projects noted above should be considered not only for their text and image handling, but also for their interface development. Many ot the text and image retrieval systems being developed also include graphical, user-friendly interfaces, in order to enable users to easily manipulate information. Further, current user interface development in the U.S. focuses on the development of a software that creates the effect of a comprehensive »scholar's workstation«, enabling the user to obtain acess to numerous different resources using one terminal and one interface.

In addition to the work decribed above, numerous additional projects are under way, under the aegis of the federal government, such as the Library of Congress, academic institutions, computer companies auch as Apple'ALOT program (Apple Library of Tomorrow) to support development of library software applications, or library systems vendors such as OCLC, NOTIS, and VTLS. Project Mercury at Carnegie Mellon University involves the building of a scholar's workstation to make information availbale to each student and faculty member. Cornell University, Rensselaer polytechnic University, and other major public research institutions such as the University of Michigan, the University of California, and the University of Illinois currently are pursuing active projects using this model.

5. Standards

Standards implementation plays an increasingly important role in the development of U.S. information technology. Many current technologies which use the Internet for communication and data transfer use the TCP/IP communication protocol. A number of institutions have implemented the ANSI Z39.50 search and retrieve protocol, thereby sharing a common command language for information retrieval between their seperate library online catalogs. Most notable among these implementations is the collaboration between the University of California (Berkely), Pennsylvania State University, and the Research Libraries Group.

A number of vendors, including NOTIS and DRA (Data Research Associates) now offer OPAC software with the capability of implementing Z39.50 to support searching by common command language between institution with the same OPAC's.

Our neighbors to the north, at the National Library of Canada (Ottawa) have recently tested their implementation of the OSI Interlibrary Loan protocol with considerable success. They plan to develop a national interlibrary loan network based on the prototype system. This significant accomplishment marks the first implementation of the OSI-ILL protocol.

Serveral industry standards for text markup, encoding, tagging, and image compression are either currently in widespread use or being tested. These include the use of SGML (Standard Generalized Markup Language), which enables tagging of online data in a standard format to indicate like structural divisions and typographical elements, in accordance with Sperberg-McQueen and Burnard's publication, *Guidelines of the Text Encoding Initiative.* [9]

6. Conclusion

The trends decribed here suggest that technological advancements are driving a quickly changing environment for both information management and the information industry in the United States. As can be seen from the example projects that have been discussed, many of these developments represent collaboration among professionals in the field of librarianship, computer science, state, and federal government funding agencies, and the computer industry. The Internet continues to be the »Atlas« on whose shoulders much of these advancements rest. Widespread and growing access to the Internet as a communication and information-finding and storing tool will likely continue, despite the current national debates about whether the planned NREN national information highway will continue to support public computing and information needs, or whether these services will be provided by commerical telecommunication companies in the future. The 1980's concept of the scholar's workstation is being refined to include friendly interface access to both and remote, bibliographic and non-bibliographic information, and automatic SDI services. Thanks to advancements in image processing and retrieval, this information can now appear in a form representing its printed counterparts, almost like paging through a book, placing a bookmark, making a note in the margin of a book, or browsing through the bookstacks.

Computer hardware and software costs are steadily decreasing, making it increasingly possible for many people to buy home computers, although the computer is nowhere near as ubiquitous as the television in the American household. Perhaps this is the signal that we are moving into another phase in reaching Lancaster's predicted paperless society, toward what will soon be the "paper-like" society.

References

[1] Krol, Ed. The Whole Internet: User's Guide and Catalog. Sebastopol, CA: O'Reilly & Associates, Inc. 1992

[2] For more Information, see: Obraczka, Katia, Peter B. Danzig and Shih-Hao Li. »Internet Resource Discovery Services«, Computer 26:9 (September, 1993) 8-22; and Schwartz, Michael F. »Internet Resource Discovery at the University of Colorado«, Computer 26:9 (September, 1993) 25-35.

[3] Price-Wilkin, John.»Text Files in Libraries: Present Foundations and Future Directions«, Library Hi Tech 9:3, Issue 35 (1991), 7-44.

[4] Landoni, Monica, Nadia Catenazzi and Forbes Gibb. »Hyper-books and Visual-books in an Electronic Library«, The Electronic Library 11:3 (June,1993) p.178.

[5] Jewett, Margaret. »Sidebar 1: ARTFL: A Textual Database«, Library Hi Tech 9:3, Issue 35 (1991) p.12.

[6] See Price-Wilkin, and Seaman, David. »The Electronic Text Center: a Humanities Computing Initative at the University of Virginia«, The Electronic Library 11:3 (June, 1993)] 195-199.

[7] Story, Guy A., Lawrence O'Gorman, David Fox, Louise Levy Schaper, and H.V. Jagadish. » The RightPages Image-Based Electronic Library for Alerting and Browsing«, Computer 25:9 (September, 1992) 17-26.

[8] Nagy, George, Sharad Seth, and Mahesh Viswanathen. »A Prototype Document Image Analysis for technical Journals«, Computer 25:7 (July, 1992) 10-22.

[9] Seaman, David, pp. 197-98.

Acknowledgments

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Czech Information - Underfed Users or Dropped Sources?

Z. Vanek,
DATA GmbH, Prag

1. Changes of Environment for valuable Information Market

Aroma of political changes recall substantial changes inside information sphere. State lost his former monopoly and economic information became most important domestic political information because privatisation or restitution scandals must be developed from commonly accepted economic sense. The elections in many postcommunist countries validated the majority of economic judgment for rejected parties. Due this existing written and non-written law and rules separated information services into 4 splitted spaces:

- media persuading electors (TV, Newspapers)
- official state information (Statistical & demographic data, services for government and inhabitants)
- services for specialist (directories, political & business sheets, databases, stock information)
- services for "people from the street" (directories, consumer consultancy).

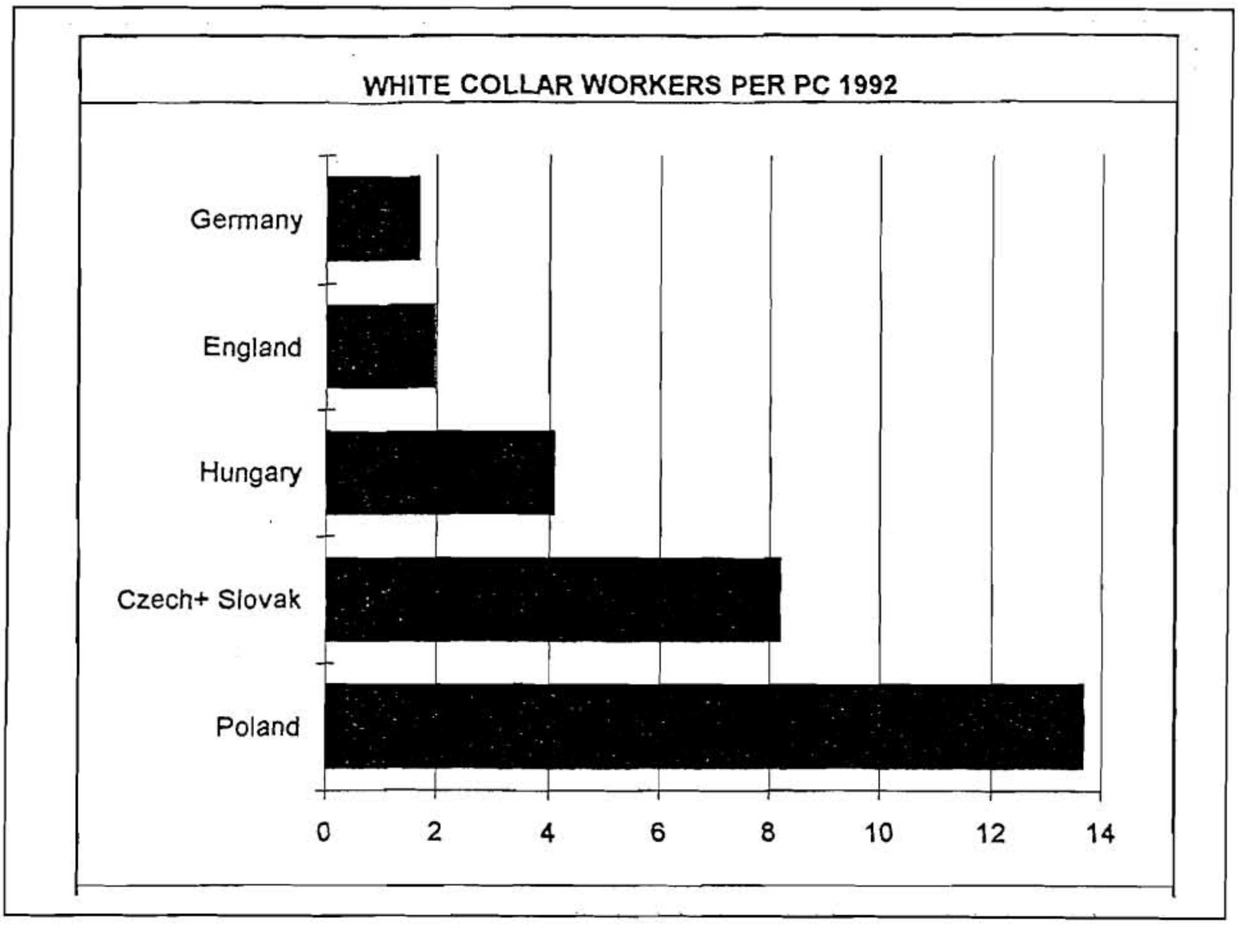
Each group has specific condition, mainly financial and law.

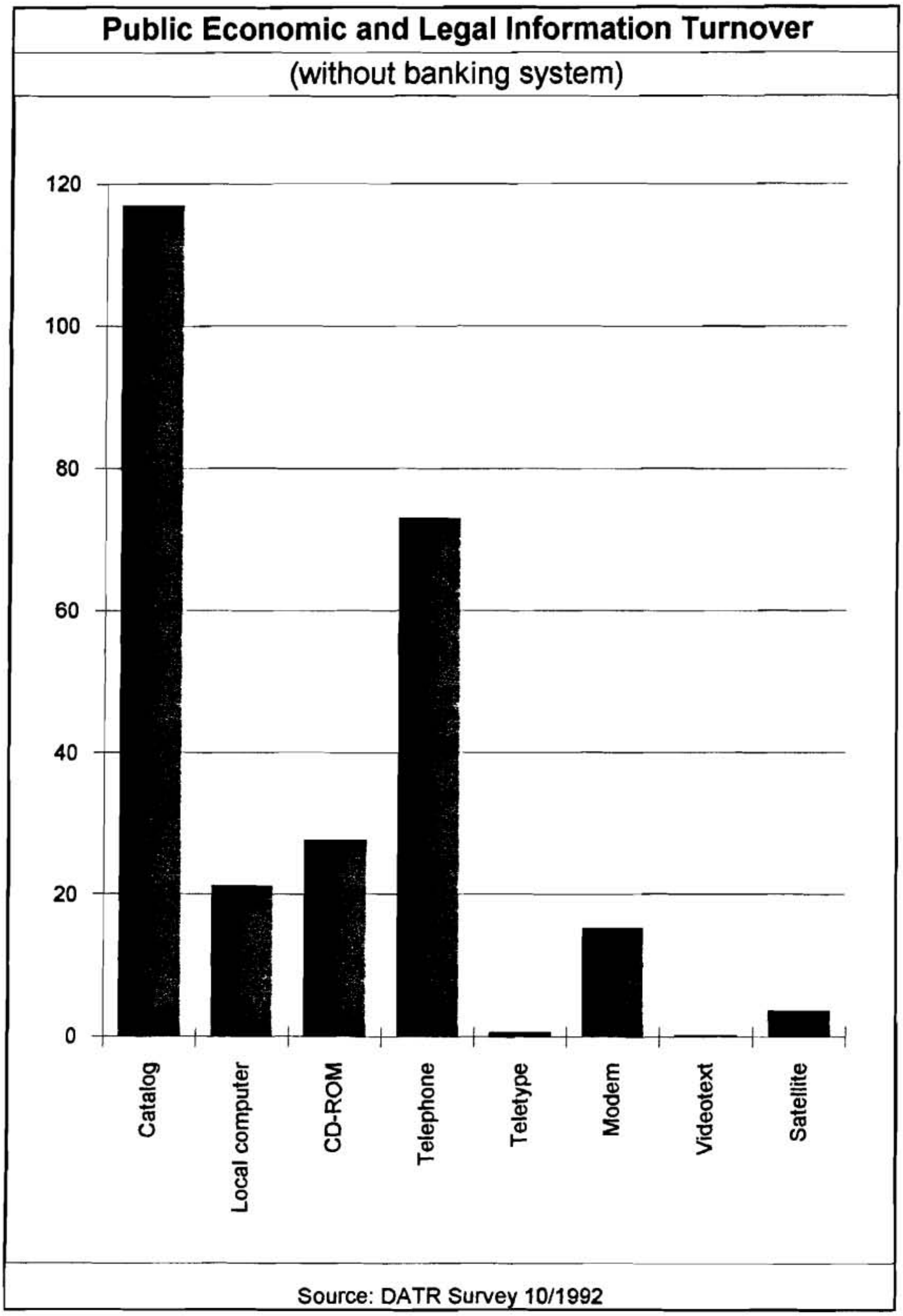
The privatization in information area had been a few decelerated. The malignant observer could say:
- sources for investment into media are hidden
- the domestic users are poor and solvent foreign companies feel troubles with the gap between West standard and East conditions
- many companies (especially share company where a state has a majority) settled the bills after 4-9 months
- producer without backing support from strong partner or state has very little chance to be competitive with receptors of support
- state support policy is not transparent, tax policy, law and convention is adequate transient situation
- new private sector reached only a few market success
- Ministry of the Interior sold the personal data of all Czech citizen to about 10 private companies (Procter & Gamble etc) with price about 3 Pfennig per record.

Czech information services have 5 real limitation:

- insolvency of domestic users
- failures and pricing of telecommunication network - due this percentage of satellite connection or voice-based services are higher then in West Europe
- undereuropean absorption ability for information products because existing successful managing rules rejects long-terms planning and western marketing rules
- education and skills of state and industrial managers whose had been prepared to prefer avoiding a failures and not to effect a workload
- failure of second-classes foreigner "consulting firm" and way of allocation of "West support". It is significant no Czech private firm beeing successful in information area had used it.

Figure 1 shows the differences in offices habit (white collars worker per personal computer 1992) and Figure 2 partial segmentation of Czech information market.




Public Economic and Legal Information Turnover
(without banking system)
120
100
80
60
40
20
0
Catalog
Local computer
CD-ROM
Telephone
Teletype
Modem
Videotext
Satellite
Source: DATR Survey 10/1992

2. Selected Czech Information Services

State Information System (SIS) is coordinated by Governmental Committee forced by Ministry of Economy. SIS has a global aim to cover a governmental informational needs. Most of individual databases has a individual law acts specifying the rules for non-governmental usage of stored data.

2.1 Personal data on Czech inhabitants

The database is produced by Ministry of the Interior. The key is date of birth combined with birth item number (so-called birth number), which should be unique. Unfortunately the election or coupon privatisation discovered duplicity in reasonable quantity of birth numbers. Each record contents from 41 fields of which are some fields protected (religion, penalties, AIDS, sexual orientation). Search is without limitation on non-protected fields under condition that the searcher can't be anonymous person. Police has an access via phone, public only personally in local police station. Police makes about 2000 searches weekly, public about 5000 searches weekly (mainly search of address). The search costs DEM 1,- per retrieved record.

2.2 Trade court register

The database is produced by Ministry of the Justice. Its a text database containing the court decision concerning law base of each trade company (establishing, changing, closing etc). There is no law limitation but in fact before each usage the searcher should recognise the competent court and then "manage" the readiness of overloaded court officers. The state price is DEM 1,- per record + DEM 1,- each page. Due to more expensive "managing tips" some private firms scan each officially announcement and answer the search immediately but without court confirmation. The retrospective is very low and depends on region. Typical trend for this database is the implementation of so- called by-privatisation in near future - explaining in last chapter.

2.3 Register of law bodies and personals doing commercial activities

The register is produced by Czech Statistical Office. Each body has a unique 8-digit number called "Identification of Organisation"(ICO). By the law bodies is ICO preceded by 3-digit region identification equal to Tax Identification Number (DIC). By personals is DIC equal Birth Number and ICO is different. These register contains more then 1 mil. records, each record has 45 public fields and protected fields with Birth No and protected economic data (turnover, profit, how many employee etc). These number was former a proof that body could provide any commercial activity and has a duty to fulfil many statistical forms monthly, quarterly, yearly. Till today is input without any problem, but updating or deleting a record has delay of about 1 year. Search could be done in each local statistical office. Marketing people buys the register on CD-ROM (price about DEM 1200-producer ALBERTINA in cooperation with Statistical office - many dealers). The last issue of CD-ROM is better then before, only 10% of stored addresses are different from reality.

2.4 Register of entitlements to commercial activity

Each company or self-shopper need ICO, DIC and entitlements specifying each field of activities. Usage of this register allow a entitlements act only if searcher specify his "law interest". Law interest is not explained that mean the usage depends on local individual decision.

2.5 Register of tax duties

These register is fully closed.

2.6 Other state registry (law acts, economic figures)

This registry are produced by state agencies (for information area exist National Information Centre-NIS, National Agency for Foreigner Information) and by distributed statistical offices. This databases has very limited usage due to quality of recorded data and technology delay after private companies. For illustration 2 examples:

Register of farmers: In two regions the register had been checked. From stored 2270 record only 260 records registered active farmers. About 89% of records had been rubbish (Source:RP 26.10.93).

Register of law acts: The state centre offer a floppy discs for the textprocessor WordPerfect with retrospective since 1990 and in future retrieval system on mainframe. The private firms offer since 1991 discs with retrospective to 1945 (all valid acts) with special retrieval and updating system or on CD/ROM. Nobody offers the translated law acts with valid court authorization (Source: catalogues on INVEX fair October 1993).

2.7 Register of possessions of houses and land

These register is updated by local subsidiary of map office. In some region it run on PC local network. Due to releasing the estate business and restitution these subsidiaries had been overloaded and delay for each written confirmation of property or inputting the closed business has a time unit counted in months or years (if requested person didn't manage a tips). The gap between information needs and capacities of offices had been solved so-called by-privatisation project. In by-privatisation's case one private company sign the exclusive contract about usage of the register. Private company pays the overtime of clerks, gives a computers etc. and receive in fact a local monopoly for usage. Each requester of individual usage pays not price according state price list but agreed price to private company (according Czech law in information area state has no influence to pricing). Due to monopoly the private company has no problem with clients and very interesting profit.

Note: The term by-privatisation method is commonly used for cases which are not a criminal case according law but unfair according people sense. In Czech republic exist no act about conflict of interest.

3. Database produced by private companies

Private companies has another philosophy - the market is king. I selected for each Czech information the market segment (exclusive banking information) the leading firm.

3.1 Voice based services

Due to missing infrastructure became those services very popular. Before 3 years started firm EDB (European DataBase). The principle of service is very simple: each local shopper or service centre pay for recording in databases, phone question answer operator free of charge. If the Telecom change the telephone number (in central Prague Telecom made in since January 1992 yet twice), the record is updated. If the town change a name of street (its happened after revolution very oft) or the company rename itself, the record is updated. Because Telecom is in fact not answering the question on new telephone numbers, the EDB service became popular with estimated EDB turnover about 3 mil. DEM in 1993.
Most sophisticated system had been implemented for about 50.000 user of RECEPTAR (the hobby club) as an phone adviser where somebody want buy details for hobby. The retrieval system (all outputs via voice adaptor) is menu oriented and user select the requested menu by voice.

3.2 Catalog, directory of companies, products from advertisement

In this market segment were active in January 1992 about 60 companies (source: survey of INFORMKATALOG). 3 companies are Czech market leaders: INFORMKATALOG with turnover 1993 about 1 mil. DEM (catalogues, directory of companies), ALBERTINA (CD-ROM with ICO directory, database of products derived from advertisement, turnover 1993 about 1 mil. DEM) and German CREDITREFORM (directory & bonito of Czech companies, 40 employee).

3.3 Science and medical information

Market number one is MEDISTYL (partner of STN International) with turnover about 0.6 mil. DEM.

3.4 Daily news, economic databases

The biggest is Czech News Agency (CTK) with turnover about 5 mil. DEM in this area. CTK has up-to-date 27 users using communication via satellite because it is cheaper and more reliable then dedicated line or PTT packed data network.

3.5 Stock information

Stable is only ZIA Service concerning agriculture products. All other services are under strong developing phase like the stock exchange rules. All shares of Czech bodies are registered in state SCP centre. These SCP centre communicate only with selected users (State fund of property, stock brokers etc).

All services are limited by telecommunication network. Since October 1993 operate private data network APSNet, which use the file transfer during the night. Because the service fee are meaningful cheaper then service of state network, the users wait in queue for connection.

4. Information offered by West hosts

To obtain regularly the database covering East countries is not a simple task. Most successful is german GENIOS, which focused its East activities into managing valuable business information. GENIOS in 1992 offer for marketing the Czech & Slovak company directories INFORMKATALOG. The second database with relevant records is CREDITREFORM. GENIOS loads into computer "The Prague Post" and in near future "Prager Zeitung". For support of czech-german trade the Union of Industry started a project to prepare a database of free Czech industrial capacities and tends to load this data into GENIOS.

The GBI from Munich offer a INFORMKATALOG database.

The DATASTAR & DIALOG offer the DUN&BRADSTREET database covering part of Czech companies.

PREDICASTS Databases cover an important part of Czech business activities, mainly from energy and chemistry. PREDICASTS PROMPT is available on each above mentioned hosts.

AGENCY REUTER, DPA and APA cooperate with CTK. They receive a foreigner service of CTK.

5. Perspectives and trends

The information market in Czech republic (in Slovakia too) feel a new chances, because:

- The mentioned private firms invest not only in the technology, but mainly into the distribution network and training of users.

- The privatization process continue, the by-privatization method would be soon rejected (elections are expected in 1996, local in autumn 1994). The insolvent users will be cleaned due to allowed bankruptcy.

- Market conditions are monthly improving, the barriers are smaller.

- New chairman of Statistical Office started a project of drastic changes switching statistical method from red commands mode into west cooperation mode.

- State support seems to be changed into transparent way.

- Users need relevant information support for investment decisions (especially about 200 active investment funds and about 70 stock intermediated firms and 500.000 individual coupons-share holders). This market segment causes a boom establishing new producers.

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Electronic Information Services in Eastern Europe
- Database Production and Possible Uses -

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1 Introduction

The Gesellschaft für Mathematik und Datenverarbeitung (GMD) is a large-scale national research establishment for informatics and related fields in the Federal Republic of Germany. It is one of the 16 large-scale research centres making up the Arbeitsgemeinschaft der Grossforschungseinrichtungen (AGF).

Working in conjunction with the International Centre for Scientific and Technical Information (ICSTI) in Moscow, the GMD conducted the first ever survey of the electronic information market in the countries of Eastern Europe over the period 1991 - 1993. The project also embraced a study into the development of electronic information and included a situation analysis. The ICSTI is an international institute founded by the CIS (Commonwealth of Independent States) and, essentially, Eastern European states. It is actively involved in the production of databases and publications and in the fields of software development and informatics.

The project was partially sponsored by the German Federal Ministry of Economics.

The results of the project have been published in two volumes entitled "The electronic information market in Eastern Europe. Volume 1: Directory of databases" and "The electronic information market in Eastern Europe. Volume 2: structure and development". The directory is also available in electronic form as an online database at the Gesellschaft für Betriebswirtschaftliche Information (German Business Information), GBI, in Munich.

The goal behind the project was to obtain the most up-to-date and complete picture possible of the electronic information services available in the countries of Eastern Europe.

The analysis focussed primarily on a study of the information infrastructure, the development of database production and the use of electronic information services in the states of the former Eastern Bloc.

2 Structure and methodology of the study

The information previously available on the databases found in the countries of Eastern Europe was altogether very limited. The scanty stock of data available on the information market and the current dynamic political, economic and organisational changes which are occurring in most countries of Eastern Europe and which are transforming the prevailing conditions virtually from one day to the next has made it particularly important to obtain reliable data on the information economy of Eastern Europe. However, these dynamic changes by their very nature have greatly complicated the collection of reliable information.

Most countries of Eastern Europe possess no up-to-date registers of their own database products. Insufficient research into the service sector and service spectrum and the inadequacy of official statistics make any detailed analysis of the Eastern European information market very difficult.

To obtain additional quantitative information on the availability of databases in Eastern Europe, a written survey of the service sector was therefore conducted in a number of these countries. The support provided by information centres and numerous colleagues in Eastern Europe was an all-important factor in this survey, particularly in terms of its completeness and up-to-date nature.

The renaming and closure of institutions in the service sector was a further aggravating factor in the data acquisition process. It proved to be a laborious business researching into the existence of institutions and identifying specific establishments.

Case studies were drawn up by the relevant information centres in order to analyse the use of electronic information services and the information policy profile. Reference was also made in this regard to publications on the electronic information market. For the reasons stated above, these publications were frequently fragmentary and outdated. These data, too, had to be checked, augmented and updated.

The study was conducted in three stages over a project span of two years.

In order to remain within the confines of this paper, this account of the project will be restricted to the results of the database production analysis and to the possibilities which exist for using electronic information services in Eastern Europe.

3 Database production in Eastern Europe

This project identified around 3000 databases from 21 Eastern European countries and the CIS states. Some 1000 limited access, internal databases were not included. In the case of around 100 databases we were unsuccessful in obtaining the complete basic data required for the description.

In order to ensure that the picture we obtained of the Eastern European databases was as complete as possible, our survey was not restricted to the online databases which can be accessed via the telecommunication networks, but also extended to include offline databases. This approach was adopted due to the fact that most Eastern European databases can only be accessed locally or on data media (magnetic tapes, diskettes).

The very high proportion of offline databases is a consequence of the poor telecommunications infrastructure which exists in Eastern Europe. As a result, only around 14% of the databases are online.

Table 1 Access to Eastern European databases

Offline	1650
Online	241
Videotex	27
Total	**1918**

The study was based on 1918 surveyed databases from 21 Eastern European countries.

Table 2 Distribution of the surveyed databases according to country

Russia	1167	60.80%
Bulgaria	161	8.40%
Ukraine	123	6.40%
Hungary	105	5.50%
Poland	69	3.60%
Rumania	60	3.10%
Czech Republic and Slovakia	53	2.80%
Latvia	43	2.20%
Belarus	38	2.00%
Other	100	5.50%
Total	**1918**	**100.00%**

As this table shows, the greater majority of the databases are produced in Russia (61%) or the states of the former Soviet Union (77%). The other countries of Eastern Europe account for only 23%. Following well behind are Bulgaria, Ukraine and Hungary. Poland and Rumania account for less than 5% of database production, while the proportion of database products located in the Czech Republic, Slovakia, Latvia and Belarus lies below 3% in each case. The other former Soviet republics cannot be represented here individually due to the low production levels. The total for the remaining 11 republics was 5%.

Table 3 Distribution of Eastern European database production according to specialist fields

Natural sciences, technology, patents	65.00%
Economic information, humanities and social sciences	20.00%
Multidisciplinary	7.00%
Other	6.00%
News	2.00%

With a share of 70%, databases containing information on natural sciences and technology constitute the largest category of Eastern European database production. (The multidisciplinary databases also consist essentially of natural-science and technical information and are therefore included in this database category).

3.1 Natural sciences, technology, patents

The proportion of databases containing information for the engineering and technology sectors is very high. The primary fields covered by these databases are electronics, electrical engineering, mechanical engineering, plant construction and tools design.

Databases holding life-science, medical and pharmaceutical information follow with a share of 8%. The biological sciences are particularly well represented here.

Chemistry and geosciences each account for around 5%. Databases covering deposits of valuable minerals, rocks, ores, coal, natural oil and natural gas are widespread. CIS republics such as Russia, Kazakhstan and Turkmenistan own a considerable proportion of the world's deposits of natural oil and gas and these databases are therefore attached particular importance.

The data processing sector makes up 5% of total database production. Databases containing information on the various branches of physics, agricultural sciences and agricultural engineering account for 3% each.

3.1.1 Energy industry, nuclear and atomic energy, environmental research and environmental protection

There is relatively little information available on the energy industry and on nuclear and atomic energy. This is due to the fact that many databases from this sector are not publically accessible and thus could not be included in the survey. The field of environmental research and protection accounts for 3% of database production.

The following tables provide an overview of the surveyed databases in the fields of the energy industry, nuclear and atomic energy, reactor technology, and environmental research and protection.

Table 4 Eastern European databases on the energy industry

Country	**Number of databases**
Russia	24
Ukraine	2
Bulgaria	1
Czech Republic	1
Hungary	1
Total	**29**

The overwhelming majority of the databases on the energy industry have been produced in Russia. The largest database producers in this field are the All-Russian Institute for Scientific and Technical Information (VINITI) and the All-Russian Scientific Research Institute for Information and Technical Economical Research in Industry "Informelektro" in Moscow. A number of databases in this sector can also be accessed online.

A total of 38 databases were surveyed in the field of nuclear and atomic energy and reactor technology. The following table shows how the databases are distributed according to country:

Table 5 Eastern European databases on nuclear and atomic energy and reactor technology

Country	Number of databases
Russia	30
Latvia	2
Ukraine	2
Georgia	1
Moldova	1
Poland	1
Uzbekistan	1
Total	**38**

Leading database producers in this sector are the All-Russian Institute for Scientific and Technical Information (VINITI) and the All-Russian Scientific Research Institute for Interindustrial Information (VIMI) in Moscow.

60 offline and online databases on environmental research, technology and protection were surveyed in the following Eastern European countries:

Table 6 Eastern European databases on environmental research and environmental protection

Country	Number of databases
Russia	36
Poland	7
Hungary	4
Bulgaria	2
Kazakhstan	2
Rumania	2
Ukraine	2
Armenia	1
Azerbaijan	1
Latvia	1
Lithuania	1
Turkmenistan	1
Total	**60**

In this sector, too, VINITI in Moscow was responsible for producing a relatively high number of databases, some of which can also be accessed online.

3.2 Economic databases

Generally accessible economic databases were not produced in Eastern Europe until the 1980s. And even prior to 1989, the only datebases were bibliographical databases with literature references to the economic sciences. New information services from the economics sector have become increasingly available over recent years throughout all Eastern European countries.
This database sector accounts for 20% of the total database production in Eastern Europe.

Although the production of economic databases is increasing, the pronounced changes occurring in the various countries of Eastern Europe have made it very difficult to obtain reliable economic and business data. The number of new businesses is increasing constantly. The wave of bankruptcies resulting from this major privatisation thrust in the East is also growing. Many new businesses are wound up again shortly after they have been founded. Legislation is changing daily. Until such time as the economic situation in the East consolidates it will be virtually impossible to produce reliable and up-to-date economic information.

Despite these difficulties, substantial development opportunities exist in Eastern Europe for the production of economic databases. The reason for this lies in the fact that the fundamental restructuring of the economy requires the best possible, up-to-date supply of information relating to the economic and technical sciences.

3.3 Language classification of the databases

The greater part of the databases produced in Eastern Europe can be accessed in the national language of the producing country. This means that more than two thirds of the databases are in Russian and over 20% in the other languages of Eastern Europe. 73 of the databases were in English, i.e. 4% of the total.

Table 7 Distribution of the English-language databases classified according to producing country

Country	Number of databases
Hungary	33
Bulgaria	15
Poland	8
Czech Republic	7
Russia	5
Rumania	4
Total	**72**

As the table reveals, the English-language databases in Eastern Europe are produced essentially in Hungary. Hungary accounts for 45% of the total production of databases in English. A third of all Hungarian databases can be accessed in English.

The dynamic growth in the private sector in Bulgaria has seen an increase in the number of English-language database products oriented to Western investors and companies. Around 24% of the total databases produced in Bulgaria can be accessed in English.

In the other countries of Eastern Europe, only a very small percentage of the databases were found to be in English.

4 Online databases in Eastern Europe

The 241 online databases which can be accessed via telecommunications networks are made available by 145 Eastern European database providers (hosts). The overwhelming majority (71%) of hosts offer up to only two databases for online use. They themselves are database producers who operates their own products online. 24% of the hosts provide up to ten online databases. Only 7 hosts (5%) offer between 10 and 36 online databases. All Eastern European database hosts are also database producers. There are no "pure" database vendors in Eastern Europe.

Table 8 The largest database hosts in Eastern Europe

Hosts	Number of databases
All-Russian Institute for Scientific and Technical Information (VINITI), Moscow	44
FuE-Infrastruktur GmbH (KFI-Kft), Budapest	16
National Information Centre of the Czech Republic (NIS), Prague	14
International Centre for Scientific and Technical Information (ICSTI), Moscow	14
Institute for Information on Social Sciences of the Russian Academy of Sciences (INION RAN)	12

The hosts of the largest online databases are chiefly located in Moscow. They include VINITI, ICSTI and INION. After the large Russian hosts come the national specialised information centres of the other Eastern European countries which operate online databases.

The National Information Centre of the Czech Republic (NIS) essentially offers Czech and Slovak database products for use online. The core of its product spectrum consists of various databases some of which provide bibliographical scientific-technical information and others of which are economic databases.

Unlike the other Eastern European countries, database sales are not centralised in Hungary. The online databases are offered by 18 hosts. The primary host - based on the number of databases offered - is FuE-Infrastruktur GmbH which, throughout Eastern Europe, is second in terms of database sales only after the Russian host VINITI.

The national host in Bulgaria is the National Centre for Information and Documentation (NATSID). NATSID, previously called TSINTI, is one of the few information centres which has been offering online information services with remote access, i.e via networks, since the mid-1980s. The institute offers interdisciplinary scientific and technical information on all fields of science and technology.

When classifying the online databases according to specialised areas, scientific and technical information services are predominant. By far the greater majority (70%) of the online databases relate to the natural sciences and technology. The number of databases providing technical information (mining exploitation, mining technology, electronics, electrical engineering, mechanical engineering, plant construction, metallurgy and data processing) is especially high (43%). 27% of databases are in the field of natural sciences. Life sciences, physics, chemistry, agricultural sciences and medicine form the core of this group.

14% of the total online databases provide economic information. 8% offer interdisciplinary bibliographical information. Book and journal catalogues, dissertations and reference works form part of this group. Humanities and social sciences make up 6%. News accounts for 2% of the total online databases.

The following table shows the geographical distribution of the online Eastern European databases.

Table 9 Distribution of the online databases according to country

Country	**Number of databases**
Russia	136
Hungary	70
Czech Republic	16
Bulgaria	6
Ukraine	6
Georgia	3
Poland	2
Belarus	1
Kazakhstan	1
Slovakia	1
Total	**241**

Most of the online databases are produced in Russia. These are followed by Hungary with its 70 online databases. The Hungarian online databases were developed between 1986 and 1990 as part of a project for the development of the information infrastructure. These databases, which on average contain only around 2000 to 4000 documentation units, are in no way comparable with the large Russian databases which, in some cases, contain several million entries. The Czech Republic provides 7% of the total online databases. Bulgaria accounts for just short of 3% of the total figure.

While online databases were identified in a few other Eastern European countries and a number of former Soviet republics, the question of online accessibility was not clarified for the following reasons:

There are a number of databases in the former Soviet republics and a number of Russian information centres which can only be accessed online within the given country itself. There are also "Online databases" in Eastern Europe which are connected to local networks and which, on the basis of Eastern European definitions, are regarded as online. Examples include the Institute for Non-Ferrous Metals in Gliwice (Poland) and the Institute for Economics of the Chemical Industry in Warsaw which operate online databases with restricted accessing capabilities.

It is therefore difficult to arrive at a precise figure for the number of Eastern European databases which are actually online, i.e. can be accessed via telecommunication networks.

4.1 Accessing Eastern European online databases

The telecommunication networks of the Eastern European countries and the former Soviet Union are generally characterised by their low density and poor quality. Data transmission in Eastern European countries was generally performed on dialup lines of the public telephone network. The entire network is technically outmoded and unreliable due to the use of analogue switching technology.

The countries of Eastern Europe did not begin constructing digital data transmission networks until the start of the 1980s. Today, most countries are equipped with data transmission networks employing packet switching based on CCITT protocols X.25 and X.75. These networks do not yet offer nationwide coverage, such that many users still have to rely on telephone lines.

5 Updating the database products in Eastern Europe

The major changes occurring in Eastern Europe have seen many database products close down. However, the number of new databases is going from strength to strength. This contradiction can be explained as follows:

- Many database producers are dependent on inputs from other establishments. As a result of the fact that cooperation between establishments is no longer subject to centralised control and interest in cooperation is being channelled more and more to the West, it is becoming increasingly difficult to update bibliographical databases which, in the main, were products of cooperation.

- For considerations which were of a primarily political and economic nature, the task of covering the key industrial nations in Europe, Japan and the U.S.A. was one of the prime reasons behind setting up databases in the East. Examples of this include the bibliographical databases of VINITI in Moscow in which over 50% of references cite western literature sources. Following the dismantlement of subsidies in the public sectors, and particularly in the service sectors, many libraries no longer have the means to obtain Western publications, especially magazines and periodicals. The continued existence of a number of databases is therefore at very great risk. The quota of Western literature is particularly significant for Eastern European database users since many of the latter are unable to obtain access to Western databases. This is due first and foremost to the high database licence fees and communication costs which are out of all proportion to the cost of living and production costs prevailing in these countries.

- Most database producers have grown used to the past practice of having the entire costs of database production and database utilisation covered by the state budget. Since 1990, only a few areas have received full state support for database production, while a number of others have lost state support for database production due to the organisational structure of the database producers.

- The future of many information establishments and their services (such as the production of databases) is uncertain due to the dismantling of the high state subsidies.

- The criterion for reaching decisions on the state subsidisation of institutions is often based solely on the organisational structure and not on the results of the work conducted by the institute or organisation.

- The number of private enterprises such as consulting firms which are trying to gain a foothold in the information market and which are beginning to produce databases is on the increase. Many have no experience of producing databases and the new products often have little in common with demand. Databases often possess no financial safeguards to ensure their continued existence. Mismanagement and lack of demand are key reasons why new databases are often discontinued.

6 Conclusion

The momentous changes taking place in the services sector in Eastern Europe calls for constant monitoring of the further developments in this sector.

In cooperation with specialised information centres in Eastern Europe, GMD has devised an instrument for the continued monitoring of the information market. Since the appearance of the database register, we have acquired the following additional data:

Table 10 Stock of databases from the countries of Eastern Europe

Country	**Database Descriptions Obtained**	**Relevant Database Descriptions**
CIS	7000	1000
Hungary	150	80
Czech Republic and Slovakian Republic	150	60
Poland	100	60
Bulgaria	40	30
Total	**7440**	**1230**

We estimate that around 300 - 400 of the databases in the current register will have been discontinued by the middle of 1994. The increase, consisting of databases not included in the first edition and new databases, will total around 1200. We anticipate that the planned second edition of the register may cover around 3000 database descriptions. The new, updated edition will appear at the end of 1994 in English and German.

Session II

Information Management in Organisations

Chairman: U. Volland

Quality Management of Products and Services in Sci/Tech Special Libraries

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1 Quality of user services in libraries - a relevant subject?

In the 1990's the success or failure of a company is determined not only by internal processes; strategically correct decisions have acquired a special importance. Competition is taking place not only in the area of market price but also in the area of product and services quality.

Applied to libraries this means that the size of the library, the collection size, and the number of library employees are less relevant to management decisions concerning the increase of product and services quality.
Instead, library management should concentrate on strategic decisions[1].

For a number of reasons quality management in library services has become an important subject:

* Decreasing library budgets:
  Library budgets, never sufficient but in the past always increasing, suffer from budget cuts in times of economic recession. Decreasing budgets have already led to the closing down of libraries.
* Competition in the information market:
  Commercial information vendors (publishers, hosts) are offering their services directly to the users and are competing with libraries on libraries' turf.
* Increasing customer requirements concerning the quality of products and services:
  Customers who are ready to pay for information are setting new standards. Six weeks for carrying out an interlibrary loan request is simply not an acceptable period.
* Information has become part of increasingly complex systems:
  Quality requirements have grown because missing or incorrect information, especially in science and technology can do enormous damage.

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1 Ulrich Hofmann: Wirtschaftlichkeit in Bibliotheken: neue Konzepte notwendig. - In: Bibliotheksdienst, 26, 1992, Nr. 8, S. 1178-1184.

* Cost saving:
  Better quality management can save the institution costs.

To sum up: Planning and developing information products and services must be a systematic process; quality must be a goal of development.

2 Definitions

Quality - meeting agreed upon requirements with the goal of permanent user satisfaction.

Quality in libraries can be defined through:
Speed, precision, currentness of products and services, reliability of information, accessibility, completeness of information, presentation of information, time and cost needed in relation to the usefulness for the client.

Quality assurance is a system to obtain the quality goal.
Quality assurance in libraries is dealing with the following questions:
Does the library develop the required products? Does it provide the required services for its clients?
Quality assurance also deals with the strategies and procedures to insure quality. These instruments and strategies are part of quality management.

Quality management distinguishes between quality planning, control, checking.
Quality planning deals with the question which requirements to products and services should be met to what extent. It is important to include the context in the planning process. Which are the goals and the mission of the library? Which users with what needs are its clients? Quality planning for a product or a service must continually adapt to the changing conditions and take into account external aspects (related to the customers) and internal aspects (related to library concerns).

Quality control - testing and correction of the realization of high quality in a product or service.

Quality checking - checking whether a product or service fulfills the requirements agreed upon.

Quality assurance should manifest itself in a policy which clearly defines the extent and guidelines of quality on all levels of the library. **Quality policy** comprises the basic intentions and goals of an organization concerning quality. These include customer orientation, fast reaction to changed market conditions by introducing new products, or discontinuation of products no longer demanded, offering products and services of high quality, strong customer service.

The concept of **quality policy** includes taking into account three factors: time, cost and product requirements. It is the goal of any quality policy to meet the customers' interest without overstraining the material, personnel and financial resources of the library.

Like the personnel or price policy, quality policy is part of the library policy. Quality decisions are fundamental principles.

3 A quality management concept for sci/tech libraries

The library community in Germany has only recently started to discuss quality management, a concept which is from manufacturing. In particular, the concept of performance measurement is being intensively discussed. Library performance is measured in relation to user needs and library resources. The methods employed are measuring, questionnaires, interviews, observation, and simulation with test persons. Quality management goes beyond the application of statistical methods to collect data and their evaluation. The quality management process needs to take into account further aspects, such as strategic planning, continuing education, continuous improvement; changes that are relevant for the library should also be taken into account.
Quality management is a comprehensive approach that does not only plead for more user-friendliness but for a different way of thinking about customers, the market, and organizations.

Quality features of sci/tech libraries:

* The library is user-oriented; its main goal is to fulfill the needs of its users.
* The library offers external information sources (including online databases) extensively.
* Document delivery, online fulltext-databases and interlibrary loan are part of the information supply concept; this means that access to information is more important than ownership.

* Bibliographic description is not on the highest level of bibliographic perfection. Bibliographic records are copied if possible. On the other hand subject cataloging is of special importance because it enhances online subject access, which users prefer.
* The library offers extensive information services.

Sci/tech libraries try to make themselves easy to use, although they are often complex institutions. A large part of the collection is openly accessible. Access to journal articles is offered through electronic databases, which are integrated into the library catalog.

In a sci/tech library the user expectations are growing

* with the availability of electronic services. For example, as soon as the *Current Contents* databases are offered, users demand abstracts of the articles as well.
* with the growing interlinking of scientific communication.

I am limiting the concrete quality discussion to sci/tech libraries for the following reasons:

* Usually sci/tech libraries are technically well equipped and offer a broad variety of electronic sources. Evaluation is especially important.
* These libraries serve a group of customers that is quality conscious and demanding quality.
* The library staff knows its clients, their work, the goals of the institution the library serves. User-orientation already has a tradition in special libraries. Only user-oriented information services have a future.
* This library type is flexible enough to react to changing conditions and requirements quickly.

4 Quality planning of information products and services in a sci/tech library

Quality of information services begins with the strategic planning process. The first step in the quality planning process is the decision, about which services should be offered. This decision must be reviewed regularly; services nobody needs should be abandoned. The services must be continually evaluated in order to customize them to the users' needs.
At what effort and cost and in what time period should services be offered? How will the access to the services be organized?

Quality of library services can already be concluded from the surroundings of the library. For example:

* The location of the library: Can the library be reached easily from any point in the institution? Are bicycle racks and parking lots provided? Surveys have shown that if it takes longer than 10 minutes to reach the library, this is a reason not to use the library.
* Opening hours: Is the library open when most users need it (during lunch hours, in the evening)?
* Accessibility for external users.

The building, furniture and technical equipment are indicators of a library's user-friendliness. Some libraries let the user know at the entrance how they think of him: He is a welcome client, or he is less important. Special libraries are traditionally user-oriented. They set great store on their appearance for the users who visit the library in addition to using the electronic channels.

4.1 Library products

The library catalog

Usually the library's main product is its catalog. Special libraries often catalog according to rules adapted to their needs; because in many cases the library introduced online cataloging before the final version of the cataloging rules RAK-WB and because it needs to take local requirements into account. Special libraries generally have considerably less personnel in the cataloging department than university libraries. On the other hand, they put great stress on subject cataloging; 80% of all searches in the OPAC are subject searches.

Databases

The selection of databases the library offers to its clients and the software to search these databases are important aspects of the library's quality. How is the access to the catalog and to the electronic sources organized? Scientific users want access to the library catalog, to journal databases with abstracts and to other electronic sources, and they want the access from their desks and with a user-friendly integrated interface. Online-Ordering must be possible; also, there must be access to external online databases, bibliographic, structural and factual databases.

Bibliographies

Many special libraries compile an electronic bibliography of the publications of the scientists in the institution they serve. This is a very popular product. On demand special bibliographies can be generated from this database. The compilation of specialized bibliographies is a service that complements online searches in internal and external databases. In order to create and edit these specialized databases quickly a reference manager software should be available.

Collection

In spite of the fact that a lot of electronic information is increasingly available, the largest part of scientific and technical information still comes out in printed form. Books and journals will remain important products in libraries.

Since it is not possible for one library to possess all sci/tech information, the collection must be complemented through document delivery, interlibrary loan and full-text-databases.

In special libraries books that are not needed are discarded. The benchmark for good quality is not its size but the intensity of use.

4.2 Library services

This is the area in which special libraries are traditionally strong. High user expectations and the fact that information is always needed quickly have created high user standards in special libraries.

Information services

Reference staff must be familiar with a large number of electronic and printed information sources. In order to keep their knowledge up-to-date, continuous self-education, training and studying of new sources are necessary. Among the latter are the sources on the *Internet*. A large part of the information on the Internet contains research results before they are crystallized in printed form. Help for the scientists searching the *Internet* will be an increasingly important information service - as long as the *Internet* is difficult to use. Professional informal networks among librarians can help to find needed information quickly and just in time.

For user training and information the following methods have been useful:

* informal introduction to the online catalog and other electronic sources

* regular user training
* help to select information sources and to find relevant information
* e-mail; netnews
* reference staff promotes innovation and marketing of services
* users are asked to communicate criticism and suggestions for improvement. Most users like to be asked for their opinion.

Online services

Access to external databases is also part of a high quality information service. How this service is offered has a great impact on the quality of a library.
Online searches can be performed by professional searchers or by the client himself. End-user searching is becoming increasingly popular among scientists. Among other reasons it is a political decision which possiblity an institution chooses.

In many libraries in the US library controlled end-user searching is being practiced. Scientists who worked in the US already have searching experience and they expect to be able to perform their own searches. In times of growing pressure on libraries (information flood, budget cuts, growing user expectations, competition through commerial companies) special libraries should react flexibly to this wish. The library should organize and controll end-user searching through

* allocated funds
* training; training software
* passwords to selected users only
* choice of database (access only to special databases)
* organization of user meetings that make it possible to share experiences
* setting up of a helpline.

Access to information

A library must strive to make a large part of its materials openly accessible. If closed stacks are inevitable, materials must be provided from the stacks immediately. Clients judge libraries on the basis of how quickly they can provide information. In the user's perspective non-availability of needed materials is expecially quality-impairing. Journals, reference tools, and heavily used materials should not be circulated. Computer manuals and other heavy-use-material should be available on reserve and as a circulating copy. Reservations of circulating books must be possible within the indicated period. If there is a heavy demand it must be possible to provide second copies of a book. A modern library must be able to provide circulation information. The

workflow must be organized flexibly enough to hurry individual books through processing, if necessary.
Some scientists want all materials on their desks. This is a conflict between personal comfort and the library's mission to provide information for all clients. This conflict can only be solved pragmatically.
There must be an efficient company or campus mail. It must be possible to receive and return books without having to go to the library every time. Printed information should be complemented by electronic information. A growing number of special libraries provide full-text documents in electronic form.

Interlibrary loan
Electronic document delivery should be integrated into interlibrary loan to take some strain off the interlibrary loan department. The Technical Information Library in Hannover, the Central Medical Library in Cologne, also British Library Document Supply Center offer document delivery services for sci/tech libraries. On the other hand, commercial vendors have entered the market. At the moment their services refer mostly to core journals. The library must try to prevent that users associate fast services with commercial vendors and slow services with interlibrary loan.

Reproduction services
Special libraries usually offer extensive reproduction services and copy services. Journals do not circulate, and researchers are sent copies of the articles they need. Many reports come out in microform. Most users, however, prefer paper copies. An alternative to producing the paper copies in the library is to outsource to a photocopy company.

Time and cost
All user services are needed quickly, and preferably at no cost. But fast quality services can often be provided only at extra cost (fax, online ordering). If the institution provides enough money to offer all these services in high quality at no cost for the users - fine. But even then cost planning should be an important aspect of quality planning. The governing question here is: How much is this service worth to our clients?

5 Elements of a comprehensive quality management

Quality concept

The quality concept contains a library's ideas of what quality is.

Organizational framework

The following aspects are preconditions of quality

* communication (interaction between reference libraries and clients and among librarians)
* leadership, participation of the management
* definition of responsibilities
* quality projects, working groups

Personnel framework

Staff qualification, continuing education, a climate in which customer satisfaction is a goal of library service and in which innovations can thrive.

Technical equipment

Quality management methods and tools

The following methods and tools are useful:

* comprehensive documentation
* quality standards in the sense of cost and measurement
* quality standards in the sense of quality determinants
  services:
  reliability
  professionality
  response
  appearance
  information:
  openly accessible
  just in time, when the user needs it
  precise, current, relevant low in price

* Analysis and problem solving
  Questions to analyse the determinants:

Which factors make our services less accessible?
How do delays in information delivery come about?
Is the information we provide precise, current, relevant?
Will our customers want to come again?

* Quality assurance projects

* Team work

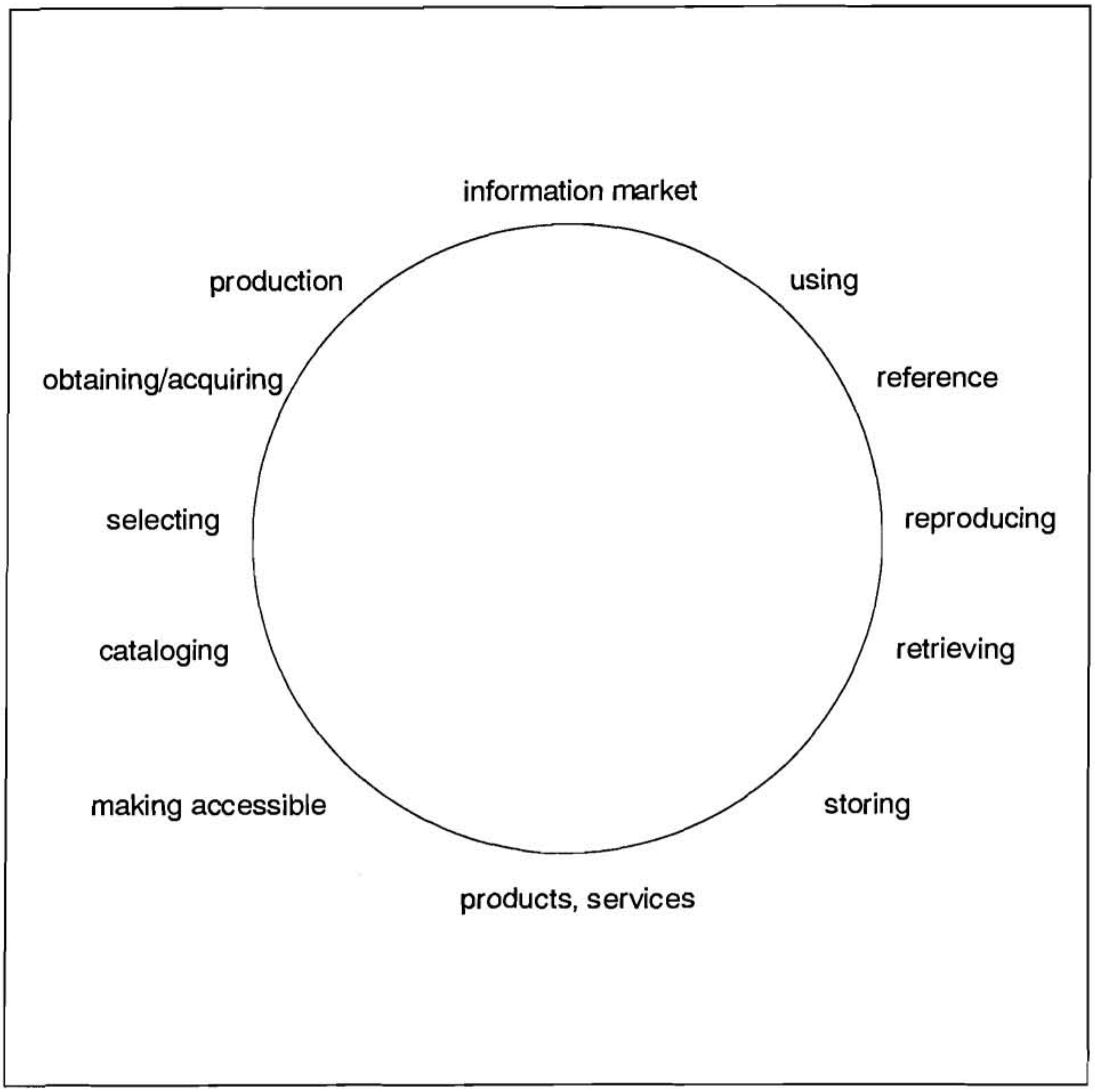

Fig. 1: Factors of quality: cost, time product requirements

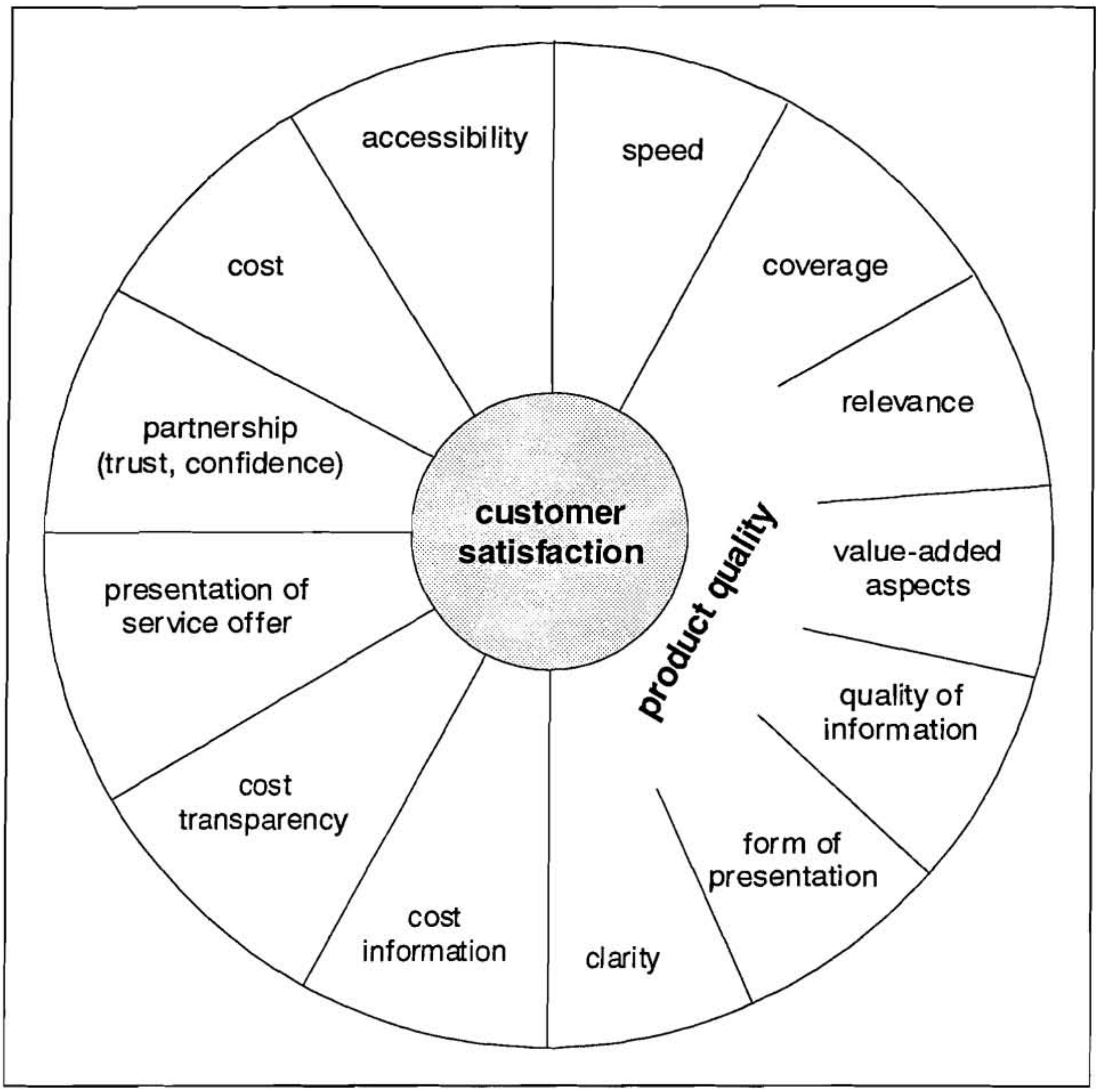

Fig. 2: Quality requirements in all phases of the information cycle. Adapted from J. Herget

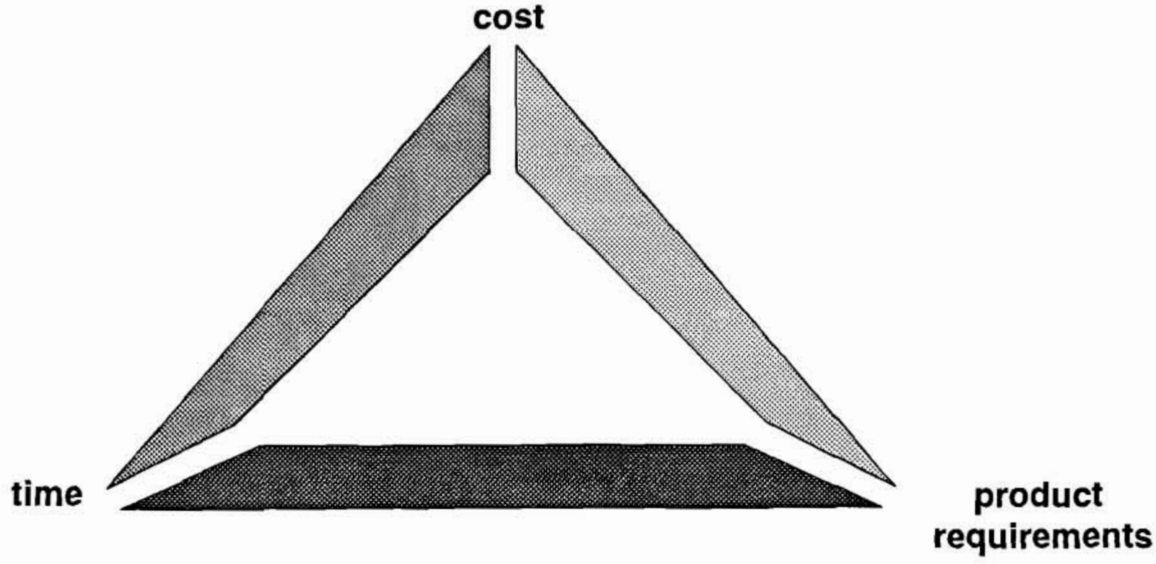

Fig. 3: Factors of customer satisfaction with information services. Adapted from J. Herget

Cooperation and Integration of Scientific Libraries

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Abstract : *Information market, the real economic environment and its changes, demand a new understanding of the library scene. A scientific library should be considered as an economic subject. The so called " Four Potatoes Modell" - an economic model of a library is presented. On the basis of a rough structure is the internal and external impact discussed. Some main tasks for future development of scientific information services in a regional context are mentioned. Some recommendations for change and its management are featured.*

Libraries and the bussiness, knowledge and the money are connected today more then ever before. On the one side the library sector represents a great, well calcullated market for publishers and specific goods or services of the information industry worldwide. A scientific library is therefore a significant economic object. Some numbers are known. There are on the other side the trends in information producing and consumption which cause a significant economic pressure on a library. It is the dynamics of the information market and changes of the information needs of a society - the growing demand, individualization, distribution and diffusion inside an explosing growth of information products and their offer. There are several reasons, first of all in weak economics, for which many of scientific libraries fall out from todays expectations. Theese are for example :

- the growing costs by a static budget,
- great investment demand of new technologies,
- absence of cooperation and coordination,
- institutional rigidity,
- exponential growth of information volume.

A major part of theese problems could perhaps be solve by increasing the budget. But it seems to be necessesary to go a step further. A library should be considered not only as a passive economic object, but as a living economic subject - taking active part in the information market and inside the correspondend environment - within the society.
It is not a secret, that every developed country has enough money for to support large projects and other expensive and upgraded activities. The only problem for the informatic and library sector is to arose public notice and to redirect the necessesary financial resources. From this could be drafted (and should be developed) a long term strategy and operational tactics for acting of the national institutions and representatives of information work and policy.
The main areas of attention could be :

- lobbying, promotion and policy,
- internal management and external market activity,
- individualization and specialization,
- globalization, kooperation and integration.

The economic reality has influence on all library activities, technologies and on all parts of the internal structure. The influence of financing is very clear by building the library foundings, and by external resources sharing too. But the financial resources are always limited, and so is the main task to look for such topics, where the economic element has a possitive influence on the effectivness and quality of the library processes.

A first approache can be made by means a simple rough economic model of a library which allow us to demonstrate the finance flow and its realization within and outside the body.

There are five elementary parts of a library body, which could be considered as individual budgetary items :

Theese are the - human resources,

- library information resources,
- external information resources,
- external library activities

and as an integrating base the

- library infrastructure.

(Like as four potatoes on a plate.)

This structure has a layered environment, beginning from the individual level, through regional up to the global level.

The human resources (*a hot potatoe, which must be handled very carefuly*) have two inseparable domains. Both, the skilled library staff and the suitable organization structure are a precondition for optimal activities. High working specialization often limits the creative space. Small dynamic teams with heterogene and complex skills are more adaptable and reliable. A flat organization structure removes the hierarchical rigidity and opens the internal communication. Instead of the pyramide a satelite structure represents the library. The considerable indepedent departments surround the managerial board and cooperate together and with their environment.

The internal resources (*a rotten potatoe, which taste is never satisfying*) are everytime a prestige matter of a library. A big number of library units does not mean often "big quality". From this viewpoint not every library can be large and needs to be large. Known Pareto s rule of 20 % decisive significance give us a large space in acquisition policy and practice. The solution lies in specialization and cooperation. What, when, how and how much to collect should be derived from native or regional competence of the library and from (often not expressed) user needs and their appearance. An active presence and a flexibility is here an order.

The external information resources (*a golden potatoe, too expensive for stilling the hunger*) are today for a scientific library a must. There is never enoug financial resources for to satisfy all the user needs, or to cover the whole offer.Here are a high professional support and some new bussiness rules necessesary. Protective charging with market influence allow a particullary circullation of the money, users are involved and therefore better served and satisfied.

The external library activities (*an evergreen potatoe, which is never ripe enough*) include a large spectrum of library services - consulting, translations, searches, analysis, guidance and training. The new in this area is the necessity of active user acquisition and education. Library marketing activity is not only a key to optimum evaluation of present foundings, but an important way to new financial resources too.

The library infrastructure (*a plate, never large enough to keep the four potatoes*) consist of two specific parts. The first is the library possesion - buildings, technology and other objects. The second build the necessesary duties for energy, leasing, traffic, post a telecommunication. Both parts should be counterballanced - a great fortune could be too expensive, but an adequate library base is unavoidable. The architecture of library technology and equipment should support the flexible organisation structure and has to follow the common trends in the information market. Distributed computing capacity and a transparent connectivity force the integration and complexity of library service.

In the same way we can feature the other topics, most important for the future development of information services in our countries. But the best management could not bring the desired effects without initiating of synergic effects, which could most and only effect over a local level. No isolated resources can equalize an interconnected and distributed system, where the individualization and spezialization bring a new up to date and desired quality. Therefore an idea about creation of regional networks - for example in the Region Wienna, Budapest, Bratislava (Danubian Scientific Information

Network) could be more real, than building of superexpensive local information resources in each country.

Hence, there are several problems from both the local and global wiew of point, which are to solve by us. Maybee, som recomendations from our experienced colleagues could be useful in this way. Here are some devises for our next way from the famous Maurice B. Line

Consider carefully how you would spent new money

Make sure you have first made best use of your present resources, e.g. by cutting out unnecessary activities and by simplifying complex ways of doing things.

Cultivate powerful supporters (members of Parliament, leading scientists, etc.)

Stimulate demand and create an "information hunger" even if it means stretching your resources

Consider whether you can give a new service that will gain the support of users, improve your image, etc.

Get feedback on your services so you know which are good and which are not

Publicize your activities

Think in terms of information, users and needs, rather than in terms of books and expressed demands

Use examples of money vasted through inadequate information, e.g. in bad industrial developments or duplication of research

It is often easier to get money for computers and other technology than for conventional library developments

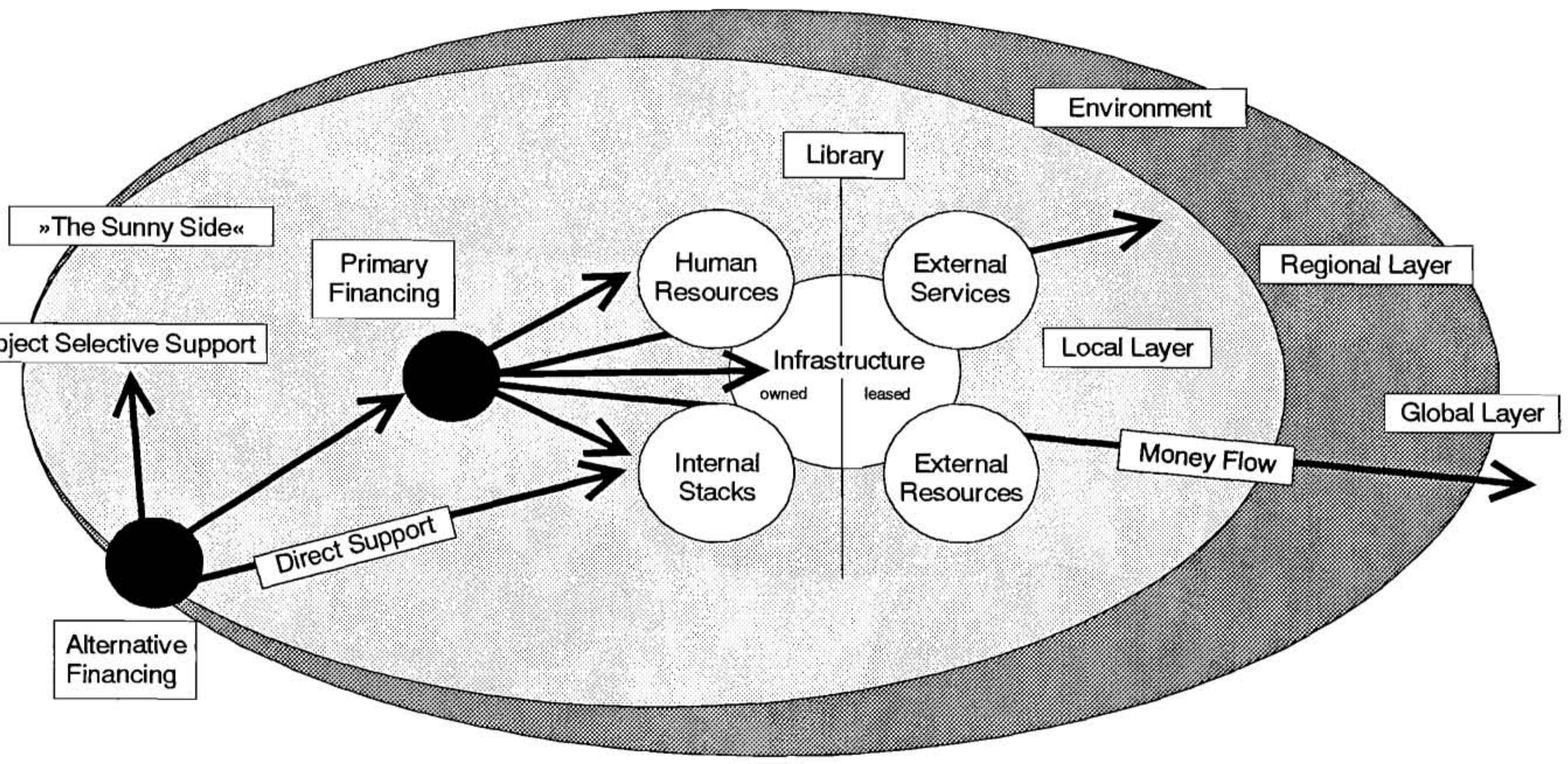
It may be helpful to bring in a recognized foreign expert, even if he states the obvious because he will have greater credibility

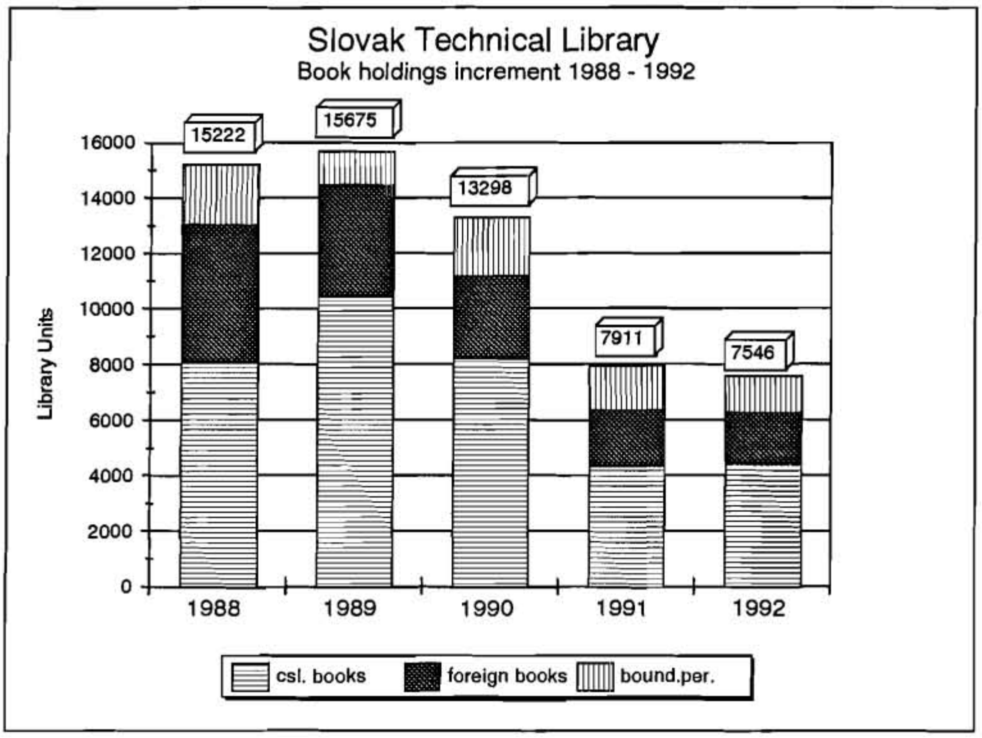
Make sure your staff think in terms of users and service

A bit of practical success is worth a lot of theoretical argument

Hence, let us consult, but help us ourself and mutualy, and cooperate together on our mission, in the world of information, without borders and other dull limitations.

»The Four Potatoes Modell«

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Book holdings increment 1988 - 1992
15222
15675
13298
7911
7546
16000
14000
12000
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8000
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4000
2000
0
Library Units
1988
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1991
1992
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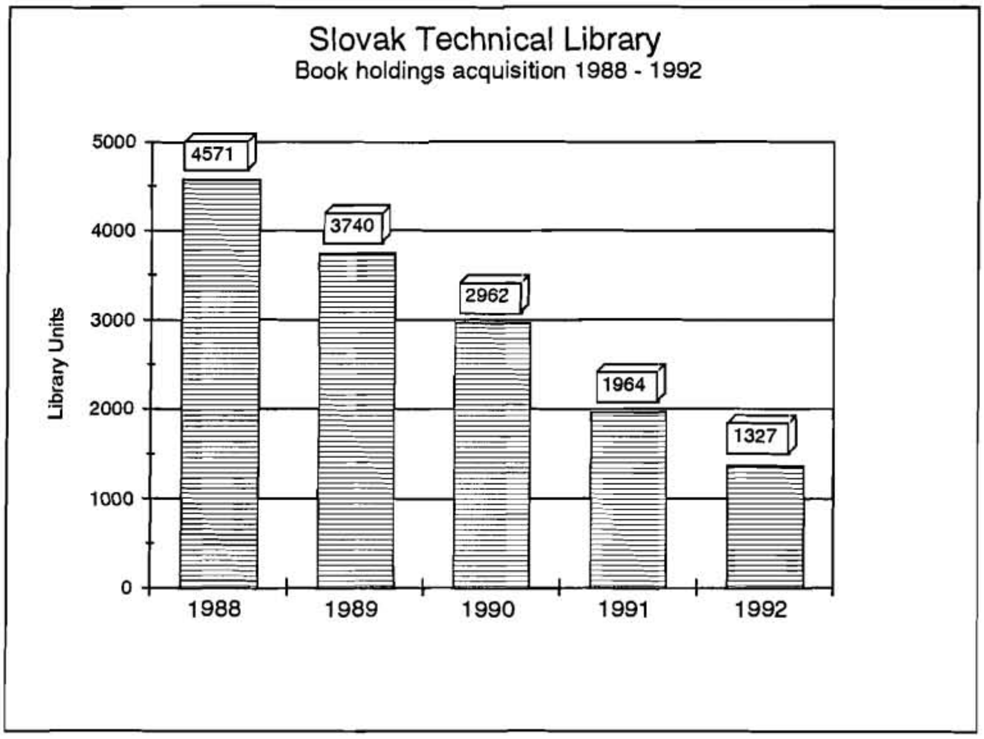
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Library Units
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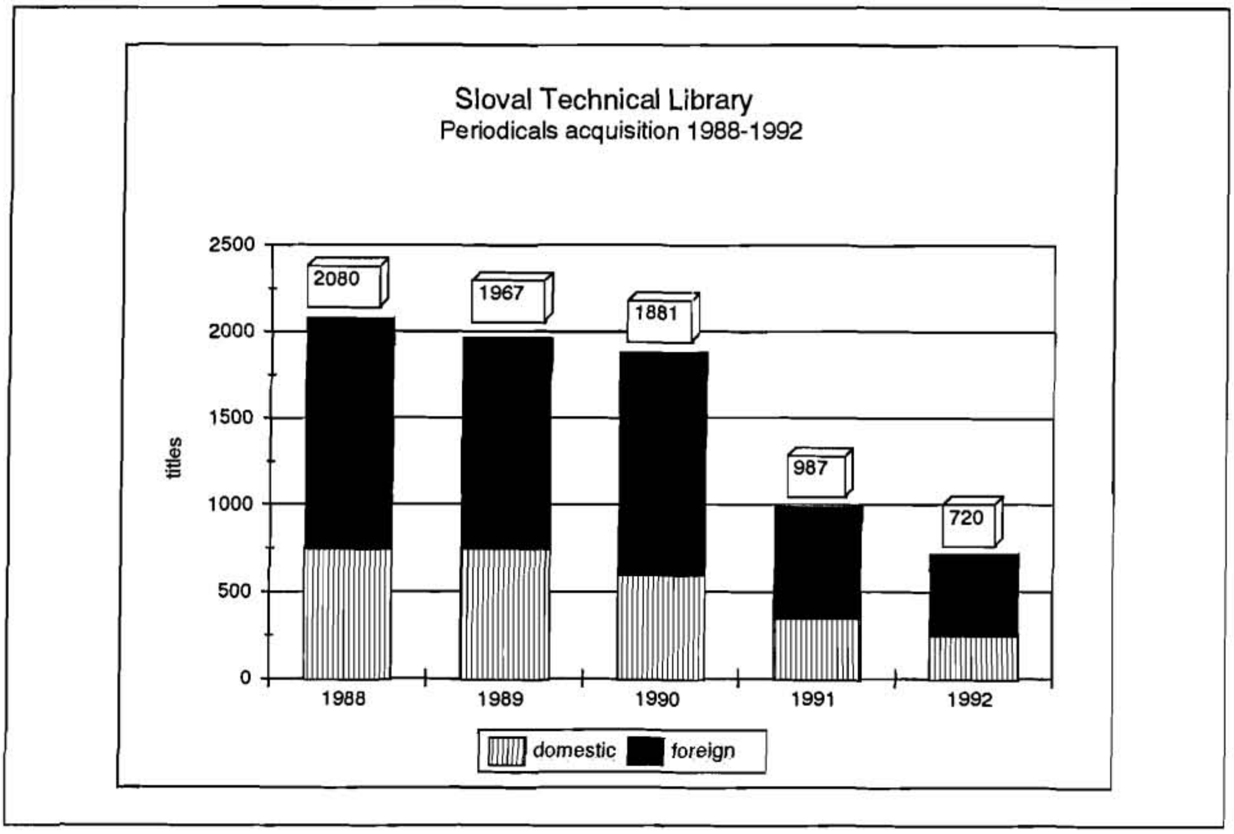
Sloval Technical Library
Periodicals acquisition 1988-1992
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domestic
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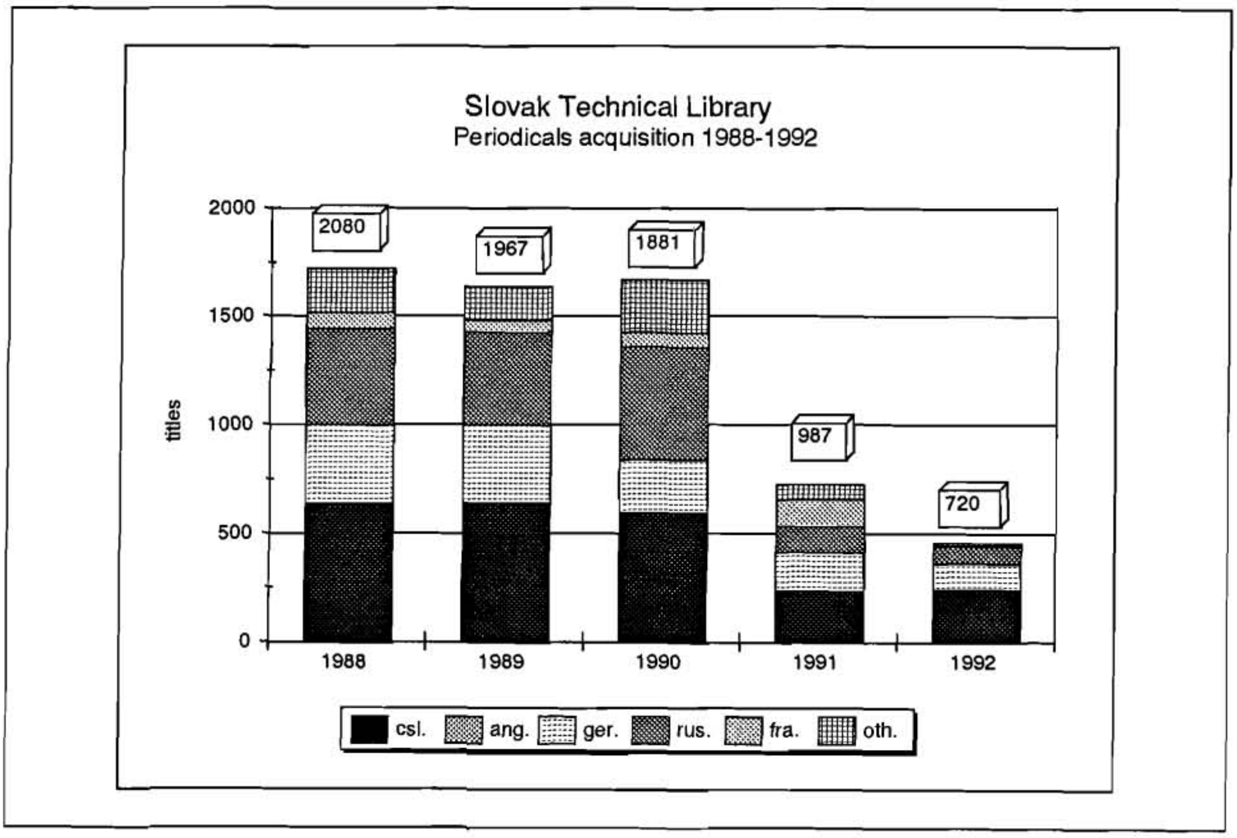
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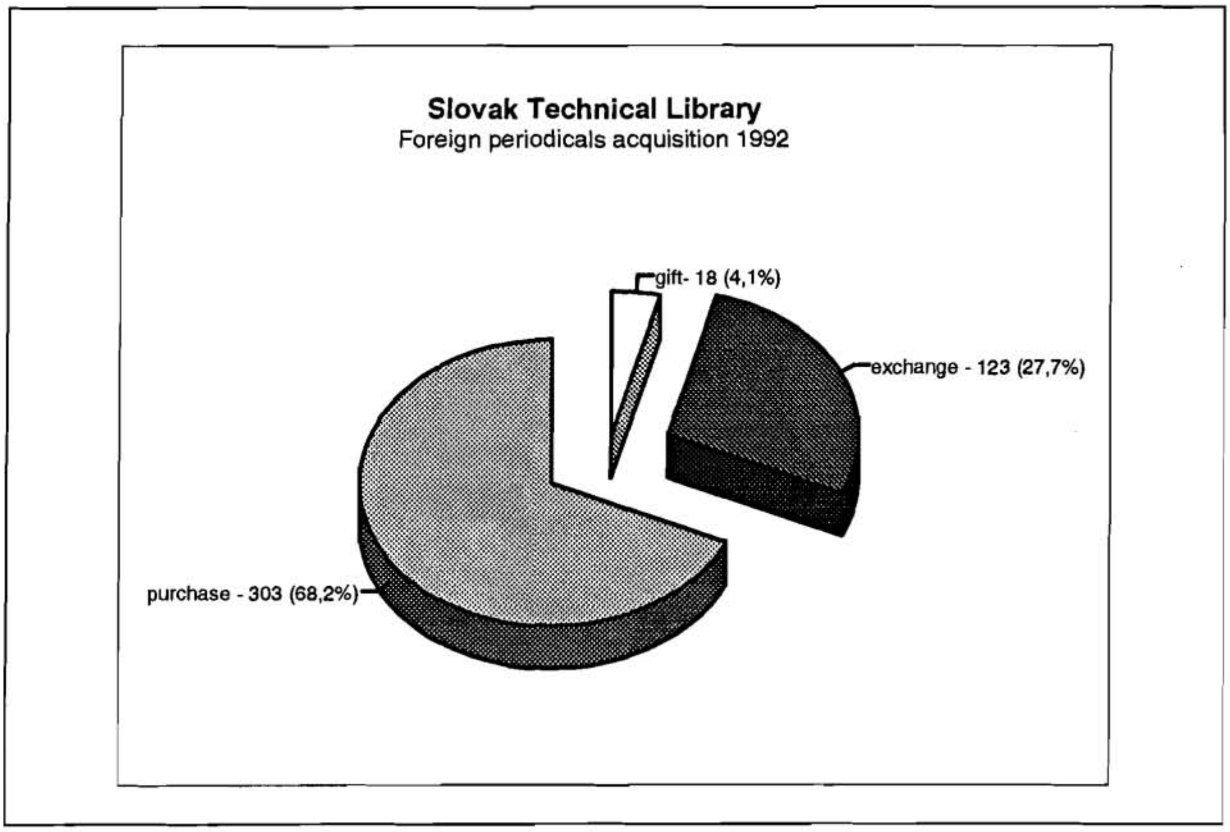
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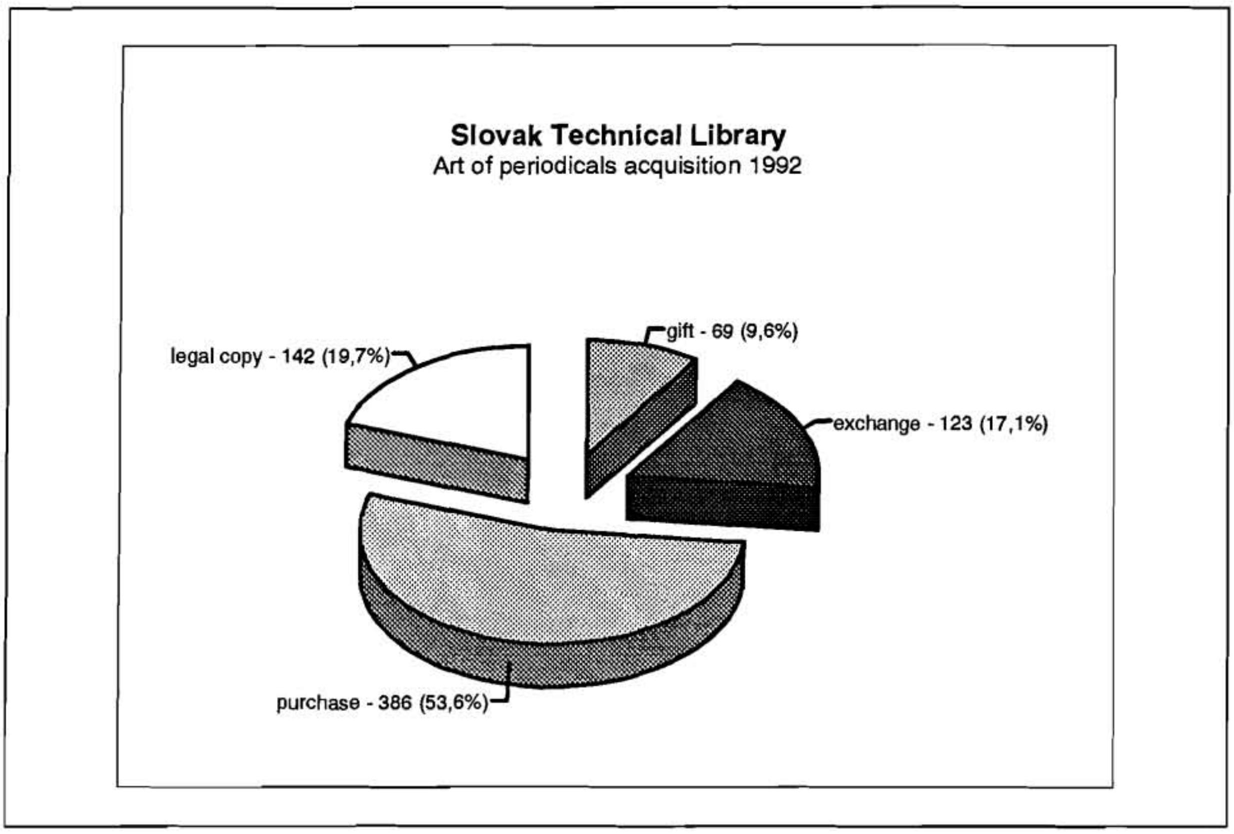
Foreign periodicals acquisition 1992
gift- 18 (4,1%)
exchange - 123 (27,7%)
purchase - 303 (68,2%)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Art of periodicals acquisition 1992
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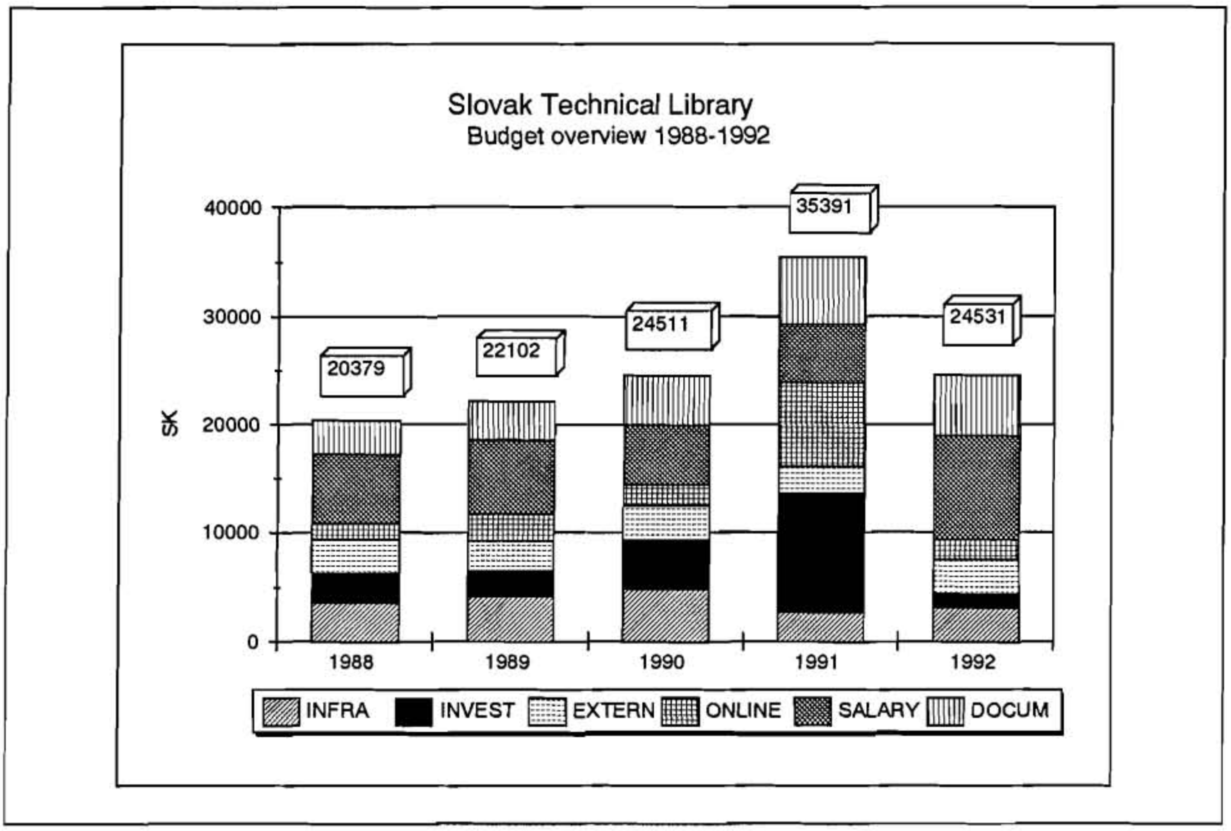
legal copy - 142 (19,7%)
exchange - 123 (17,1%)
purchase - 386 (53,6%)


Slovak Technical Library
Budget overview 1988-1992
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EXTERN
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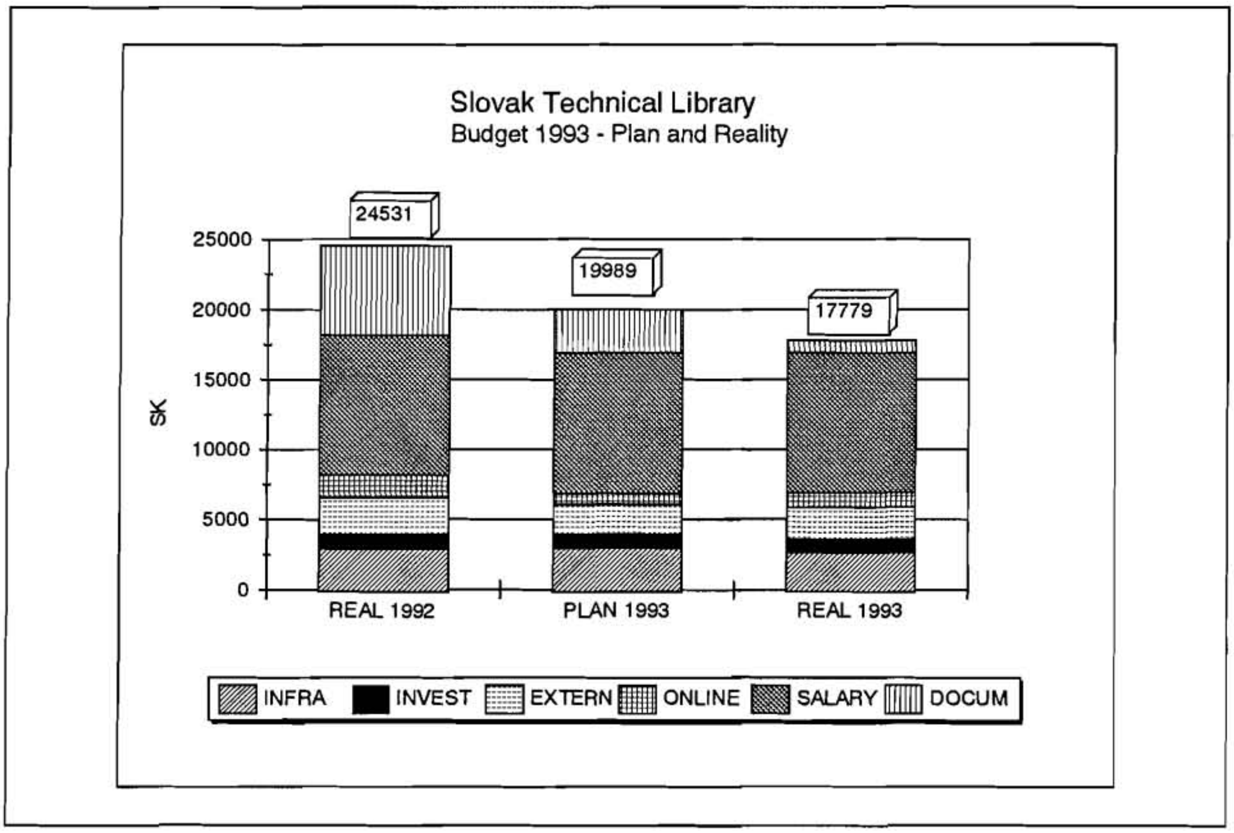
SALARY
DOCUM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Budget 1993 - Plan and Reality
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20000
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10000
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24531
19989
17779
REAL 1992
PLAN 1993
REAL 1993
INFRA
INVEST
EXTERN
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Scientific and Technological Information System in Lithuania - Structure and Management -

Z. Kirklys
Lithuanian Information Institute, Vilnius

Information and knowledge have become one of the strategic national resources determining to the great extent the economic potential of any state and, also, scientific, technological and cultural level of the society. To make effective use of information, acknowledged as the major catalyst of the society's progress, national policies for the development and management of the scientific and technological (technical) information (STI) system of those states are prepared in many countries. In broad sense such policies are oriented to improve the supply of problem -solving information as well as the popularization and the widest possible diffusion of science and technology. The main goal of the STI system is to improve the flow of information from its generators to users, its storage and handling.

There are different approaches to building STI systems in different countries.

In some countries the role of information infrastructure is well recognized and supported by state high level authorities. In others information policy has not been characterized by establishment of clearly defined objectives for the STI system as a whole; many elements of such system are working independently under market economy conditions.

What is the situation like in the Republic of Lithuania?

Before Lithuania regained its independence in 1990,its STI system was a part of the former Soviet Union information network and was oriented to the needs of plan economy under strong central management.In Lithuania the main institutions of this network were Republican Information Institute with several branch offices in territorial centers (industrial towns) and branch STI centers in comparatively large research institutions and enterprises.

After the Soviet Union had stopped its orders to Lithuanian science institutions and enterprises and the process of their privatisation started, Lithuanian information policy had to be basicaly changed reorientating itself to meeting the national needs under conditions of market economy. For this purpose the former Republican Information Institute in 1990 was reorganized into Lithuanian Information Institute which was charged to perform functions of a national information center. The Institute worked out the outline of Lithuanian STI policies. The main goals of the STI system are specified as follows:

- developing and introducing effective system which ensures creation of information products on domestic knowledge and their dissemination;
- enabling users the efficient access to domestic and foreign information sources (publications, "grey" documents, data banks) as efficiently as possible;
- finding possibilities for entering into relations with national and international information centers, scientists and businessmen;
- ensuring high level technologies for information collection, processing, storage and transmission;
- laying down the basis of legislation of the STI system.

To achieve these goals it is essential to work out a special state programme. Methodological and financial assistance from international and national organizations would be very helpful in preparating and implementing such a programme in Lithuania.

To carry out the specified goals, it is necessary following:

- effective organizational structure of the STI system;
- funding sources;
- technical background;
- information basis;
- specialists.

For the management of the STI system in Lithuania three-level approach is used.

The first level - Department of Science, Studies and Technology of the Lithuanian Government which coordinates information activity on the state level.

The second level - a national information center, the functions of which Lithuanian Information Institute was empowered to perform. The Institute is a state scientific institution subordinate to the mentioned Department. One of its functions is to help the Department in forming and implementing state information policy and in preparation of laws, methodical materials, etc. connected with information activities in Lithuania.

The third level comprises such institutions as state and private information centers, the Center of Bibliography and Bookscience, libraries of Lithuanian Science Academy, universities, public libraries of major Lihuanian towns, Euroinfocenter of European Community and others. The main function the institutions of third level is to accumulate and systematize information, generate data bases and create favourable conditions for customers to make use of information.

Financial support for the STI system development is very important but very hard to get in the current transient stage into market economy in Lithuania. There are some subjective factors that play part. For example, the proper allocation of financial recources to STI activities depends on the recognition by the high-level authorities of the role that STI plays in country's economic development. We sometimes miss such kind of understanding. Lack of finance creates difficulties in acquiring publications, CD-ROMs, data bases in libraries and information centers, in generating data bases of state importance, using data banks and electronic mail, etc..

The role of technical infrastructure for STI system is very important, too. Many different problems exist in this field in Lithuania. Among them the following should be mentioned: imperfect telecommunication, especially computer network, lack of finance to buy reliable mainframes to run on-line data bases. Copying and publishing equipment in many information centres and libraries doesn't correspond to the modern standards. Technical assistance rendered by Western countries is very important but it cannot solve the problem. The situation may improve with Lithuanian economy becoming stronger. Establishing information centers with joint Lithuanian and foreign capital, taking part in international programmes funded by UNESCO, UNDP, PHARE, etc. would be useful, too.

Generating and updating data bases of state importance such as Register of the Lithuanian enterprises and institutions, Lithuanian scientists, Lithuanian research institutions, enviroment monitoring, etc. is funded from Lithuania's budget. Other data bases must be run on the commercial basis.

In spite of the fact that generation of national data bases has been announced as one of priorities and that they are of great importance in managing Lithuanian economy, there are very few of them at present. The running of some important data bases has stopped during the last 2-3 years, because of lack of financial support. This is the case with bibliographic data base "Ecology", which contained about 100 thousand documents and was maintained by Lithuanian Information Institute.

The remote access to foreign data banks is not regular now due to technical problems and mainly because of financial difficulties in research institutions and enterprises. Therefore, data bases have not become an instrument of everyday work to managers, businessmen and scientists.

There are quite a number of specialists in Lithuania who are familiar with information and documentation activity. However, not all of them know new information processing technologies well enough. A lot of information and documentation specialists work in Lithuanian Information Institute.

Lithuanian Information Institute, which after reorganization in 1990 became a national information center, was established in 1958. Now it works under the Lithuanian Government according to its statute and is managed by the director nominated by the Government.

Among the main tasks of the Institute, are the following:

- accumulation and analysis of economic, social, technological and other information and its supply on commercial basis to the authorities (Parliament, Government, ministries, municipalities), research institutions, enterprises and individuals;
- applied research in such fields as scientific information and documentation, innovation policies, information processing technologies, industrial property protection, economic and investment problems, etc.;
- data base generation such as Lithuanian companies, scientific institutions, Lithuanian scientists and some others;
- preparation and publication the editions on economic, social, legal, technological problems in Lithuanian and foreign languages. The Institute posseses a small printing-shop.

In this short introduction we tried to disclose the structure and management of Lithuanian information system which is now in the process of development and adaptation to the new requirements of market economy. Its future depends to a great extent on the activity of Lithuanian information and documentation specialists, on Lithuania's abilities to fund the development of STI system and on support from foreign institutions and specialists. Any mutualy useful links and cooperation would be wellcome.

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Information Management in Estonia
- Current Situation and Outlooks -

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Information technology in Estonia has developed rapidly after the country regained its independence and a transition to market economy started. Paradoxically, the basis for this development was created during the »dark age« of Soviet rule. The computer community of Estonia has always been eager to gain all possible information about the newest achievements in information technology. Engineers, struggling with hopelessly outdated and unreliable Soviet-made equipment, had to apply all their skills to keep it running, and were able to gather valuable experience in the process. Programmers, having to devise almost all the software needed themselves, tried to cope with the limited computer resources and at the same time succeeded in introducing some new western software technologies. As a result, at the time of the collapse of the Soviet political and economical system Estonia was in possession of a concentration of computer specialists, capable of performing the transfer to a modern technological basis quite rapidly.

Today we have practically no Soviet-made computers in use any more. About a hundred new computer companies are producing and marketing world-level hardware and software products, as well as using contemporary methods in information systems design. The development of information systems is guided by the Informatics Council created by the government and financed through the Informatics Fund. Legislation is being developed to provide a sound legal basis for the use of modern information technology. Estonia has a Law on national data registers; laws on data protection and privacy are being introduced soon - all of them devised taking into account international regulations and corresponding acts of the European Community and the Nordic countries. The first Estonian standard »Requirements on information technology in Estonian cultural and language environment« has been enacted recently. Information technology procurement for the public sector has been regulated in accordance with the requirements of free market competition.

Telecommunications are also developing rapidly. The telephone network is being modernized, new digital switches are installed at a fast pace, fibre optical cables are being laid. The mobile telephone system is getting more and more popular, a paging network was introduced recently. Estonia is in possession of a public data communications network based on newest technology.

The modern technology described above is being used most actively for the introduction of government administrative systems. Among other massive users are the banking system, publishers, design firms, research establishments, not to mention more traditional ways of computer usage that have been adopted almost universally, such as bookkeeping, planning, etc. Yet on the background of success, we have to admit serious drawbacks in the specific field of **information-services**. Here the development is relatively slow and loaded with serious problems.

Let me once again return to the past. Inside the Soviet socialist economic structures, much attention was paid to the scientific and technical information sector. Information services in the economic, political and other fields were practically non-existent for obvious reasons. At the same time, a massive »STI system« was called into existence. About ten years ago, Estonia with its one-and-a-half million population had more than six hundred people employed in state information bureaus and centers. Their productivity was low, the technological basis and supply of information sources completely unadequate. Computerized databases were created with great difficulties, used mainly off-line and distributed through magnetic tapes. On-line services were rarely used mainly due to the lack of communication resources. Access to western information networks and databases was extremely limited.

After the collapse of the Soviet economic system, the »STI system« also declined. Almost nothing is left over of the old information bureaus and centers. On the ruins of the system, a new information services infrastructure is slowly arising, struggling with difficulties.

The main incentives for the development of information services are the needs of the market economy. Business databases are the ones most asked for in this situation. As an example, one of the new private companies in this field, »Connectus« is marketing an Estonian companies database. The services are offered off-line, yet the database is also accessable on-line through a host in Finland as well as the host GENIOS in Germany. Other similar databases are offered on bulletin-board systems. Political and economic news (e.g., the newspaper »Baltic Independent« full-text) are also available on-line, again on a bulletin-board-type system. Legislation is another much-asked subject matter. The State Computing Center offers a database on Estonian legislative acts.

At the same time, high interest exists for business information from western databases. Several private companies offer their services as information brokers. Some western information services, e.g. the Finnish »Telesampo« offer their services on-line in Estonia through the Estpak data communication network. The Estonian banks are using Reuters and Telerate services intensively. News agencies have direct links to the on-line services of western news agencies, such as France Press and Reuter. The Estonian Chamber of Commerce and Industry is connected to an international network.

The government administrative information systems also act as information providers. A comprehensive national register of enterprises was established about three years ago and is offering information to the public by the way of a bulletin- board system.

In the field of **scientific and technical information**, however, the situation is different and the activity quite low, mainly due to a lack of financial resources for science, education and culture and transition difficulties in the field of industrial research and development. The libraries are slowly recovering from the transition shock. Their situation seems to be more encouraging compared with the economy in general. The library stock is something of permanent value, so the bibliographic databases created during the Soviet regime have not lost their worth and their development can be carried on smoothly. Some of the leading Estonian libraries have bibliographic databases now and a national bibliography reaching back to the sixteenth century. The Estonian National Library has concluded a contract for the introduction of a modern library system to be extended for the whole scientific library network.

The development of factographical databases has practically stopped. At the same time, interest is very high in scientific circles for the manyfold western databases accessible through international networks. Yet due to financial limitations, access to these databases can be obtained only through the Internet network thanks to financial assistance from the governments of the Nordic countries. The telecommunication links are quite well developed and more than 50 scientific and educational institutions are connected to the Internet framework.

It should be mentioned, that the relatively new information distribution medium - databases on compact disks - is also gaining popularity. Several large libraries are regularly using CD-ROM databases carrying bibliographic and patent information.

Looking forward, it seems that in the near future no substantial changes in the use of information services should be anticipated, the main reason being financial constraints due to the economic situation in general. The interest of business, banks and government agencies for international on- line information services continues, yet the volume of usage is determined by their financial resources. On a limited scale, similar databases could be offered by Estonia to the international community.

The scientific community wholly depends on the financial aid from other countries and international funds. Without this assistance, the use of international information networks would definitely be quite low. The industrial research and development facilities are still going through a painful transition period. Introduction of new technologies depends mainly on foreign investments, so the provision of information services needed is organized through the foreign business partners. The systematic and economically justified use of western technology databases could be assumed only in specific fields, such as electronics and biotechnology.

To speed up the development, financial as well as technical assistance from western governments and organizations would be most helpful in the following directions:

- the creation of databases in fields, where Estonia is in possession of unique information resources, such as oil shale technology and environment protection;

- the establishment of a commercial host center equipped with modern database and communications hardware and software;
- purchase or rental of some of the most significant western databases to be installed in a local host.

As a result, the telecommunication and access costs for the users could be drastically reduced, thus making the information resources available to many more users, foremostly for scientific and educational establishments, but also to small business, research and development companies.

Information Services of the Hungarian Technical Information Centre and Library

G. Stubnya
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It is a well knonwn fact that during the last three-four years the economic situation has been changing permanently in Hungary. This rapid and fundamental change has resulted many new questions and demands in connection with the information services and business life. The three main fields where these changes might be summarized are the following:

-- At first the rapid proliferation of modern information technology - as PC-s, CD ROM-s and the new data telecommunication network - can make direct and quick connection among the increasing number of information suppliers and the users.

-- The second is the new and permanently changing structure of industry included the many new small and medium sized enterprises /SMEs/ and joint ventures which are the potential new users of the technoeconomical and business information.

-- The third is the increasing connection of Hungarian information institutes with the European Community's information projects.

My institute, the National Technical Information Centre and Library /henceforth: OMIKK/ recognizing this process endevours to adapt its activity to this new situation.

The library and information activity of OMIKK has started about loo years ago. The institute is the most important technical information centre and the biggest technical library of the country, its 7oo professional staff members and outside specialists posess extensive knowledge of information practice and languages.

Based on the processing of the largest technical book and periodical collection in the country, yearly loo-lloooo annotations,

abstracts and digests are prepared. These form the basis for nearly 5o secondary journals, transferred monthly to Húngarian users, Utilizing of information resources we make SDI and retrieval services too.
Mainly for the foreigen inquirers a selected materials from the Hungarian technical and scientific periodicals are abstracted and published in English entitled the "Hungarian R and D Abstracts". Its content is available by computerised online search too.
Our translation department prepares abaout half a million pages yearly covering 3o languages from and to Hungarian.

After this very short introduction to our traditional activity I should like to exhibit our newest development connection with the new situation and demands.
In the case of library, beside the computerized acquisition and cataloguing system,which we do together with other big university libraries, we have acquired the Multy Platter CD-ROM network system of Silver Platter together with the necessary facilities. The network enables the simultaneous uses of 21 CD-ROM databases from 2o terminals. Recently we already have more than 3o databases for disposal used partly in the drivetower and other accessible on single drivers.
In addition to the traditionally offered technical information services of OMIKK there is an ever increasing demand on the part of SMEs for business information. Therefore we launched a project together with the biggest university and county libraries.We hope that this network with the help of their theoretically integrated stocks will help to satisfy the newcoming demands for business information. To promote the connection among the researchers within and out of

the country we have started to create new databases:

-- Database of the research and development institutes in Hungary. This database we started to build in 1992 contains detailed information on the situation in Hungarian research in two languages, in Hungarian and English. We created the database, but in publishing we have closely co-operated with a German publisher, the Verlag Dr. Josef Raabe KG of Stuttgart, which is publishing the data of 27 countries under the title "EUROMECUM - European Higher Education and Research Institutions", beginning 1991. The Hungarian education and research data is part of this directory.

-- The current research projects in Hungary.

This also aviable in Hungarian and English languages too. Both these database work under UNIX operation system with "Adabas natural" software.

Our newest project intends to make technical and economical information more useful and accessible to the SMEs. With the help of computerisation of processing work we are creating a database of these bibliographic items. We want to fill in abaout loo ooo new data with Hungarian title translations and keywords yearly. The database is operating with mikro ISIS-Pascal software. According to our idea we should offer the free of charge use of this database to the university and high school libraries and about 2oo public city libraries all over the country. We hope to update these focal points every month sending the increase on magnetic or paper media according to their demand. They should get all the new updates or only the demanded profiles in the form of magnetic media on textfile or database form. From 1995 this database will be used for online retrieval too.

This project should give the chance to reach the more than ten thousand potential users of technical and economical information and with the help of intermediary services of these libraries we shall get more and better knowledge about the real demands of the end users. Recently our greatest problem in connection with this project to find sponsors in order to be able to give this service really free of charge to the libraries. We hope to get the lo million forint which needed to this project from our state authorithy or other fundation for the next year. Later, we hope that this project will be a part of the big library development project starts fom 1995 with the support of World Bank. In this case not only the university libraries but also the public libraries may develop to real information centres of their area. This World Bank project aims to modernize of the Hungarian university's education and research organizations and systems similarly to the western methods. Within this project is planned the modernization of the Hungarian library and information network serving the higher education. This project would give a great chance for the non profit orientated information institutes to find their prospective role in the newcoming system.
On the other hand during the last three years a lot of new small firms started to work in the information business. A few of them are state owned partly or totally but mainly they are private and a lot of them are joint venture. They supply mainly company or market information.
It is also significant that all the old and new firms try to make connection with western firms especially the information projects of E.C. Within the scope of national and international cooperation my institute has an active role included the progress of the Hungarian Databas

se Suppliers. We have organized more seminars together width E.C. and Hungarian experts. The main topic of these meetings were how the information supply of SMEs could be developed.
The DAT 93 an international conference and exibition-which has its meeting just in the same time as our conference here-represents the newest developments of the more than 2oo Hungarian database suppliers added with many lectures of western experts.
I think this present workshop is also a very good chance to me to get new ideas for developing our information services. Therefore finally please let me say many thanks for the organizers to give me the chance to be present this workshop.

The Automated Information System of the Central University Library of Bucharest - A Pilot Project in Romania -

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The Romanian libraries, like the ones in most of the countries, are grouped in three main networks:

- the network of public libraries, which is subordinated to the Ministry of Culture;
- the network of Academy libraries - libraries belonging to the Romanian Academy or to its branches;
- the network of university libraries, which is subordinated to the Ministry of Education;

The most important libraries within these networks, due to the functions they perform, are the National Library, The Library of the Academy (which is also considered a national library) and the Central University Libraries.

The Central University Libraries are autonomous institutions, not subordinated to the universities and belonging directly to the Ministry of Education. These are: the Central University Library of Bucharest, the Central University Library of Iasi and the Central University Library of Cluj. Storing rich document collections, sometimes unique for the national culture, the university libraries have, beside the educational role in forming the new generations, a leading role in promoting the new information technologies.

Built at the end of the nineteenth century in the center of Bucharest, the Central University Library of Bucharest is an institution with tradition, an institution which is considered one of the most representative libraries in Romania due to the informational services it offers to the readers. Unfortunately, during the events in December 1989, the library was completely destroyed; entire collections of documents of real value, manuscripts etc., practically unreplaceable, were burned.

The tragedy of this library determined many national and international organizations to contribute to its reconstruction, orienting their aids in three directions: rebuilding the house, rebuilding the document collections and modernizing informational services. In this respect, we should mention the message that Mr. Federico Mayor, General Director of UNESCO, addressed on 30 April 1990 from the destroyed building of the Central University of Bucharest: "UNESCO wishes to make its own contribution to restoring this library, which has become the symbol of the fight for freedom, to its place as the country's foremost cultural and scientific centre. The library must first of all be equipped with modern facilities, namely a data processing system for the computerization of all its services for the establishment of data bases and for access to national , regional and international information networks".

Having the benefit of international support from many governmental and non-governmental organizations, the library became a pilot system in modernizing the information activities, not only for the libraries but also for other institutions in Romania, such as specialized documentary information centers.

In 1990 the UNESCO specialists, together with Romanian specialists, have prepared a framework project regarding the automation system of the library. The main objective of this system is the comprehensive fulfillment of the information requests of the library users (professors, researchers, students), accomplished through modern information processing and dissemination methods.

During the design phase of the project special attention was paid to compatibility with other information systems used worldwide, regarding the standards and procedures used for document description and also for communication in automated networks.

The main subsystems were defined as follows:

- the acquisition of documents (including both documents on traditional media and microfilms or CD-ROMs);

- the processing of the documents in order to enter them to the automated system;

- on-line public access catalogue both to the library data base and to other data bases via automated information networks;

- document lending;

- preparation of bibliographies, on request or pre-arranged (such as doctor theses in Romania).

The evaluation of the data flow in the system, of the functions the system has to perform and of the number of users, endorsed the definition of the general requirements for the hardware and the software support of the system. In the final phase, when the library house will be completely rebuilt, the hardware configuration of the automated system should include approximately 150 workstations, connected to computers with a total capacity of circa 4 GB of external memory. The workstations will be placed in the library services especially for data entry, in the catalogue room for user access to data bases, and also in the library branches (the library has a central building and 10 branches in faculties placed in different locations in Bucharest). The workstations will be connected in local area networks; the communication between the library and its branches, as well as between the library and other systems will be performed through data communication networks (through leased telephonic lines), that is metropolitan networks.

The software support will include the following components:

- dedicated software for library activities, especially for document retrieval;

- local area network management software;

- data communication software.

The realization of this system, the first of this kind in Romania, was started in 1991. Obviously, in 1991 the library did not have computers; and the librarians and the library users were not acquainted with using the computers.

In the first stage, the automation works were concentrated upon data base structures, data record formats and data processing flows.

UNIMARC was adopted as data record format, and CDS/ISIS was used as software support. The first hardware configuration was bought in 1992 and it was a local area network of 12 PCs placed in the library building that houses the technical services (acquisitions, document processing etc.).

Once the PC network and CDS/ISIS were installed, document descriptions were entered in the data bases for all the documents acquired beginning with 1990. The hardware configuration also included CD-ROM drives.

Keeping the general conception from the framework project, the library developed its hardware configuration and also acquired specialized software required for the integral completion of the system.

At the present moment, the library owns a hardware configuration which includes:
- 1 MicroVAX 3100 minicomputer with 16 MB internal memory and 1,2 GB of external memory;
- 20 terminals;
- circa 40 PCs, each with 1-2 MB internal memory and 40-80

MB hard disks;

- printers;
- 10 CD-ROM drive;
- modems and routers for telecommunications.

These equipments are connected in a DECNET network in the two buildings housing the library operations. The connection between the two buildings, which are a few Kms apart, is done through leased telephone line. You can see the block diagram of the hardware configuration in Fig. 1.

The system's data base contains circa 60000 records (books and periodicals) and it is available on-line both for the library users and for the library staff.

At present the data base is managed by CDS/ISIS. Recently, the library acquired new software - VUBIS - which will be installed soon. The CDS/ISIS data base will be converted to a VUBIS data base.

The number of documents acquired by the library between 1990-1993 is much bigger than 60000; the processing capacity (due especially to the staff number) is of about 20000 bibliographic records per year.

Of the 60000 records processed until now in the library, 336 refer to environment protection, which means a percentage of 0.5%. Among these, 112 refer to environment protection legislation (that is 0.33%).

Beginning with 1993, the Romanian institutions have access to the European Academic Research Network - EARN (via a computer science specialized institute - the Central Institute for Computer Science Research). The Central University Library was the first information institution to have access to EARN and as well to electronic mail via INTERNET or BITNET.

* * *

The Central University Library being defined as a "pilot library" in the field of national information automation system, many similar institutions are interested in using the same automation solutions, including institutions working in environmental protection.

There are some information organizations in the field of environment protection in Romania; some of them have tradition even if at present they belong to other organizational structures (the Ministry of Environment - Institute of Environmental Research and Engineering), others are just established, such as the local Environmental Center. These institutions own collections of documents of real interest.

Unfortunately, there is no nation-wide information network specialized in this field, nor are there information data bases available for specialists and for public.

The creation of data bases with nationally and internationally compatible structures, which should include documents (books, articles, CD-ROMs, microfilms) regarding nuclear safety, radiation and environmental protection appears even more necessary knowing that a nuclear power plant will be operating soon in Romania, at Cernavoda. In addition, Romania already has certain problems regarding the environment protection.

The initiative of creation of informational structures of large interest can only belong to specialized institutions such as the ones subordinated to the Ministry of Environment, and also the Institute of Atomic Physics, the Local Environmental Center - Romania and others, with support from the institutions with experience in modernizing the informational services for the public (such as the Central University Library of Bucharest).

As a matter of fact, the specialists in the mentioned institutions are already collaborating. No doubt, as the information technology support is developed in Romania (hardware, software, national data transmission network, connection to international data transmission networks etc.), an information automation network will also be developed.

The modernization of the information services, the increasing volume of information interchange at national and international level, the access to information being made easier both for specialists and for public, will certainly lead to changing the mentality about the environment.

Through their educational role, the libraries, and especially the university ones, have the possibility to take part in this action, so important to the future of each country and of the entire mankind.

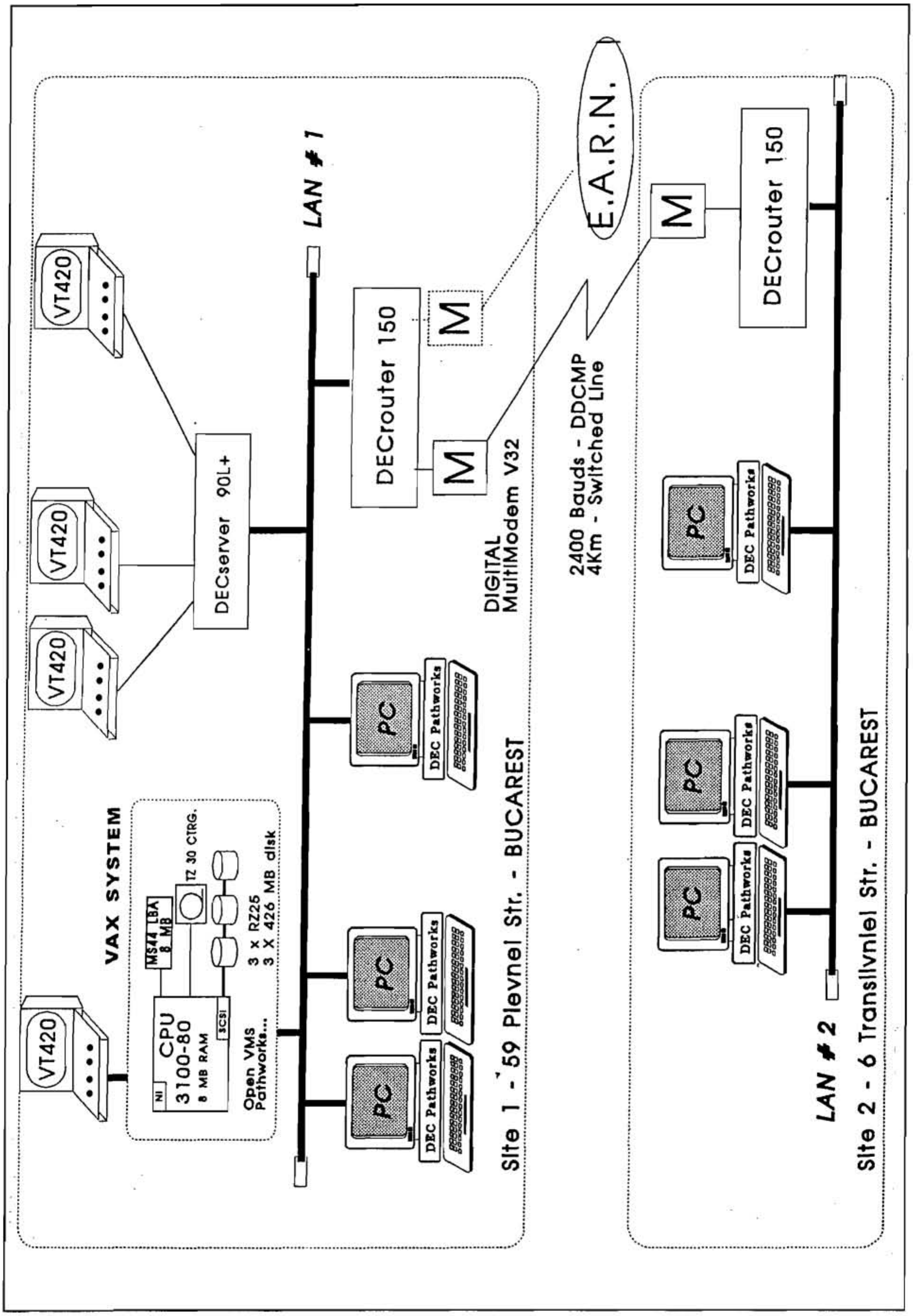

Fig. 1: Bucharest: Central University Library - Block Diagram

Information Management in Latvian Research

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The considerable changes are take place in Latvian science today. **In the USSR period Latvian research system was a comparatively good part of All-Union science system.** Latvian Academy of Sciences had been included in USSR Academy system and acted as an administrative structure. The main scientific institutes were placed under the Academy, some of them under various ministries (Public Health, Agricultural, Forest etc), some of them were the branches of All-Union research institutes (app. 2).

A number of scientific institutes and a number of results of investigations are well known, some of them were the most prominent in their fields in the whole USSR, some even in international science, especially in the fields of mathematics, physics, chemistry, pharmacy, marine geology. Major financing for research was granted from USSR Academy of Sciences, All-Union State Commitee for Science and Technology and corresponding ministries as well as from contracts with industry, the military etc.

Scientific institutes were seperated from universities, the last were included in the system of Ministry of Higher Education. Financing of researches, the scientific equipment and materials, the infrastructure in universities were comparatively worse and, as a result, investigations were on lower level.

With the collapse of USSR all the system is broken. Latvia today has too large research potential for our small state. Therefore process of reorganization in Latvian research system is take place nowadays. **Today in Latvia is a new law regulation of researches, the last are organized by several state institutions** (app. 3).

Latvian Council of Science is a public community what unity authorities of Latvian science from institutes and universities. In 1992 was established Department of Science and University Education in Ministry of Education, Science and Culture. State scientific institutions are passed under this department in administrative sense.Latvian Academy of Sciences is transformed in a personal Academy. Process of integration of research institutes with the universities is started. Nowadays is going on organization of State Commitee of Information.

We must define our needs, possibilities and priorities in broad spectrum of researches. We must continue researches what is on high level in comparison with international science and in fields of importance for our state and society.In 1994-1996 investigations in Latvia will be carried out in number of fields (app. 4), which are united in five groups. The operation of Nuclear Research Center is considered more detail (app. 5).

The economical situation in Latvian science is hard. It is very large difficulties to grant from budget institutes, universities, libraries and other scientific institutions as well as scientists and groups of scientists (app. 6). The distribution of finansing in 1994 is an attempt to ensure todays needs of society and to preserve a potential for future researches.

One of basic laws of the management theory determines that timely, complete and precise information is an indispensable condition for effective actions and optimal decision making, for working out strategy of national economy and governing of state, for research work and introduction of high technologies. Integration of the research institutes with the universities, increasing of part of studies without assistance, implementation of new fields and courses of studies make high demands to textbooks also, compare both research and educational information. We are considering the supplying of this information to researchers of scientific institutes and departments, professors and students of universities, specialists of government institutions as a task of paramount importance.

Scientifical and technical information supply in Latvia is provided by several research libraries. Functions of research libraries are changing today - instead of traditional book stock modern institutions which collect, process and supply information are created. Some of them have more or less comprehensive collections, the others have selective stocks, different fields of acquisition and, as a result, different users (app. 7).

Latvian Academic Library (LAL)is one of the oldest in Europe, it has been founded in 1524. At present it is not only the main scientific information establishment in Latvia, but also the independent state research institution. Its users - all Latvian specialists and intelligentsia are served in all fields of researches. In library collection are printed documents, microfilms and microfiches, CD-ROMs etc.

In Latvia there are 10 libraries of higher educational institutions, their readers are mainly students, lecturers , researchers and other staff members of corresponding universities. The oldest and biggest university library in Latvia is the Scientific Library of University of Latvia (LU), founded in 1862.

In the collection of Patents and Technology Library (PTL) is patents, standards and technical information. Total collection of National Library (NL) - more than 5 million documents, but only a small part of them is a scientific literature in social sciences and humanities. Collections in corresponding fields are in Scientific Medical Library of Latvia (ML) and in libraries of scientific institutes.

It is a difficulties in finansing of the research libraries of Latvia. Finanses is inadequate today, especially in comparison with research libraries in Western Europe (app. 8). Libraries have too small finanses for acquisition, therefore subscription to many international journals ceased in 1991-1992. We are sure that in the near future the economic situation will take a turn for the better and subscription will be resumed in full measure.

It is possible and advisable to organize the acquisition of the basic scientific information materials in one library in Latvia nowadays. Under the present financial conditions such a concentration of information is a normal situation as the main research institutes and departments as well as universities in Latvia are situated in Riga or around it. For all the specialists is guaranteed the possibility to use the same source of information. This is a distinguishing feature in information management in Latvia.

Evidently, there is a cooperation in acquisition between libraries. Priorities in the acquisition of information materials have been established together with the scientific community. In LAL determination of acquisition policy is the main task of the Council of Library. Researchers of different fields from universities and institutes are members of this Council. Interlibrary exchange of information materials is important component of acquisition, especially for grey literature. Preference in acquisition policy is given, as far as possible, for more operative documents - journals (the ratio journals : books is more than 50:50) and grey literature (about 10% of total).

In Latvian libraries problem of preservation of information materials becomes very actual today. There are large collections of old and rare books, manuscripts, periodicals and other documents of a great value not only for Latvian history, but for culture, history and science of Europe. We must start immediately to create duplicates of those documents for users and to conserve originals for careful keeping.

Various services in different research libraries are offered to diverse categories of users, to professors and students, academicians and assistants. Basic services are acceptable for all users, extra services - for more important categories only. Different services are intended for internal and external users in libraries of universities and institutes.

For availability of library stock, for effective using of the printed documents very important is elaborate and detailed cataloguing and classification of information materials. In Latvian libraries today really are available only card catalogues - both alphabetic (name) and subject (mainly UDC classified). Current MARC format compatible cataloguing is started in several libraries (LAL, LU,PTL).

The ways of automation in libraries of Latvia depend on the chosen approach to the solution of these problems and the financial potentials of the libraries. LAL has purchased the LIBER system. There are included specific Latvian characters in the system, that allows to compile records of Latvian books. At the present moment integration of LIBER system with documents processing and readers service technologies of library is in the final stage, it is started data entry in the system. NL and PTL are finishing selection of automation system also. In our opinion, the adaption of finished and approved system in close collaboration with the designers of system is cheaper and more reliable, practical results can be obtained in a shorter period of time.

LU has chosen an another way and is working at its own system, in this library the data entry is started also. Some other libraries of universities are interested in this system. Such diverse approach to this problem at the present stage is quite acceptable, it does not hinder the development of the state cataloque as a distributed information system and the data communication between the libraries.

We are sure, that **information supply for science, economics and education can be realized only by combined using of traditional printed documents and the new information technologies, based on electronic data storage, processing and retrieval systems.** An application of these technologies is started in Latvian libraries holding scientific, technical and technological information first of all.In these fields the advantages of electronic technologies are of primary importance.

The first CD-ROM workstation in Latvia was created in LAL in 1992. Our experience shows that the researchers and specialists are very interested in CD-ROM technology, especially those involved in natural sciences and high technologies. Unfortunately, less interest show the specialists of social sciences and humanities. It was proved, that to assimilate CD-ROM technology is easy even for people without experience in computer application. The library continues to expand this modern informational service by means of increasing the number of workstations and acquiring of fresh CD-ROM databases. Some other libraries are ready to start CD-ROM service also, first of all LU, PTL and ML.

It is extremely important to organize qualified reference and information service in research library, first of all active service - help in the selection of literature and answers to the inquiries of users. There are special inquire and consultation desks in cataloque halls of libraries and reference departments for more size references. Corresponding information materials are in these departments, most qualified staff is working here. Regular information about new literature in libraries is prepared. Latvian libraries compile current and retrospective bibliographies and indexes in different fields including national bibliography. This work is coordinated between libraries.

National and international interlibrary loan is a necessary part of information service of scientific library. At present it is the most widespread and most coordinated cooperation form of libraries. LAL, LU, PTL, ML and NL are the participating libraries of the international interlibrary loan in Latvia. We also are interested to satisfy the requests from the libraries abroad with the literature that has been published in Latvia. In fact, today our needs for literarure published abroad is greater than vice versa. Mostly we receive requests concerning rare books and grey literature.

Specialists are needing the information not only in reading halls, but, in the first instance, at their working places, in laboratories, therefore the lending service is obligatory in scientific library. There is diverse lending policy in different libraries concerning to categories of borrowers, loan period and number of items which may be borrowed by user.

In LAL all specialists have a lending service, borrowing limit - 10 items, but in fact this established order is not kept strictly. Retention time is different for different materials - from 24 hours till 30 days. Reservation and references about borrowed literature is possible. It is not available for lending rarities and manuscripts, periodicals of previous centuries, reference and bibliographic books, literature from archives stock, CD-ROMs.

Qualitative operation all of this services nowadays is impossible without connection of scientific institutions and research libraries to international information networks. Our specialists need connection to on-line catalogues and databases, reference and information services, receiving of abstracts and full texts of documents, they need these services at their working places.

In 1993 was realized connection of LAL to STN International databases. STN announced that, for 1993, selected databases are available for some countries, including Latvia, at a price 80% less than regular fees.These reductions really contribute to using this service and first months of operation show increasing interest of our specialists in it. Its using in future in a large measure will depend from economic situation in Latvia and from discount policy of STN is next years.

Services charging policy is various in different libraries and for diverse users. In LAL there are some partial paid services - CD-ROM, on-line, copying, loan. Users pay only 20-30% from cost price, scientific institutions can pay for services to their employees as well as. Such procedure is necessary not for library extra incoms, but for discipline of users.

Connection of our research institutions to information networks is take place today. 19.2 kbps cable are operating from Riga to Tallinn, further is laying the fiber-optic cable to Helsinki (App.10). By means of this channel is realized the connection of host computer, placed in University of Latvia to INTERNET. LAL have full INTERNET connection to this host by a special line. Other scientific institutions and libraries are started on-line connection by means of standard telephone lines of Riga public network.

Creating of X.25 Latvian Academic Network LANET is going on in cooperation with scientific network of Germany WIN. It is realized the connection of two X.25 switches to Berlin by means of 64 kbps channel (App.11). At present to switches are connected LANs in University of Latvia and Institute of Electronics and Computer Science. In our plans is to lay fiber-optic cable in Riga and to connect to X.25 switches other universities, institutes and libraries.In near future we must connect both networks by a gateway also.

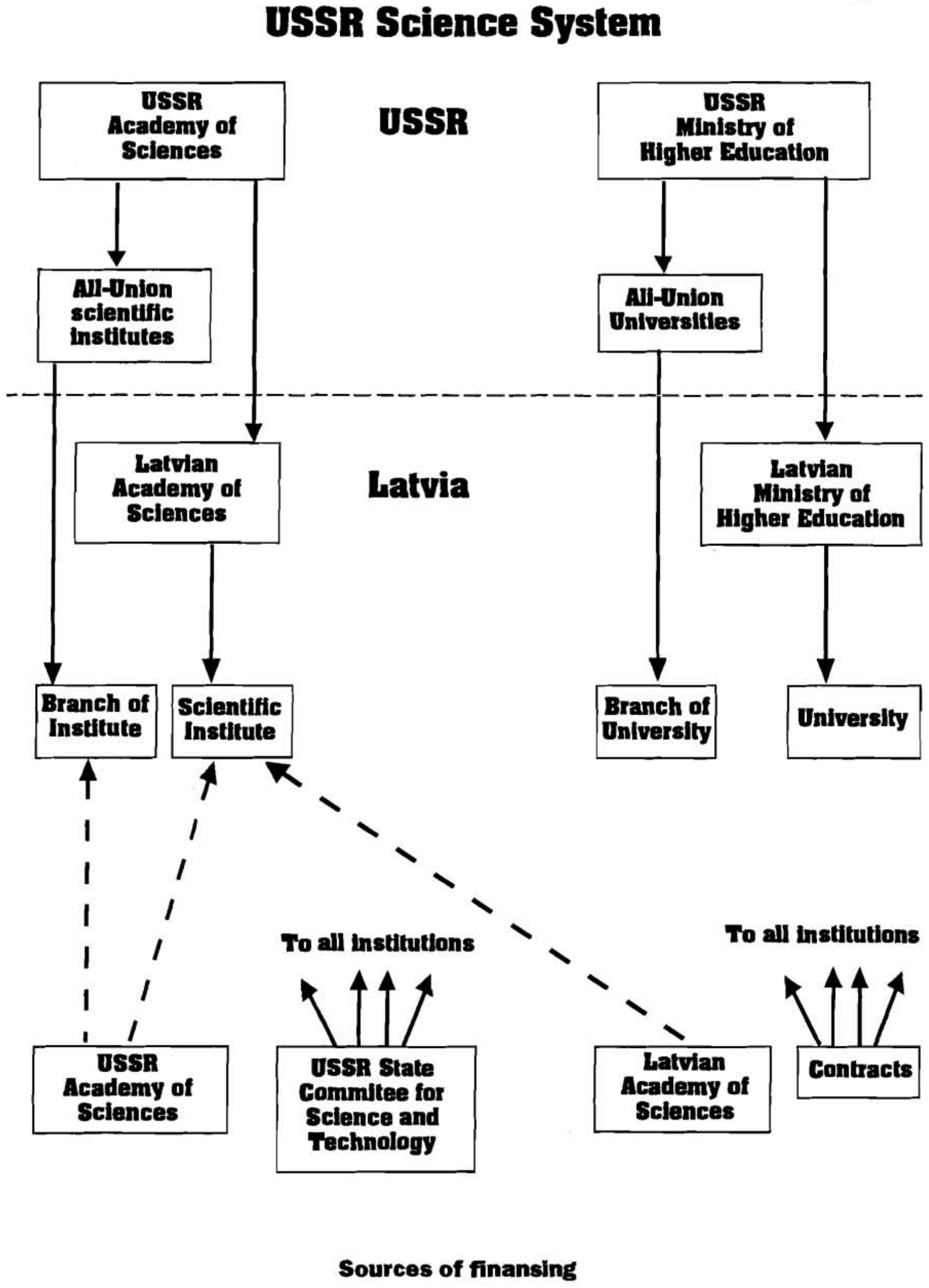
Creating of this networks is necessary to have on-line information from Latvia also. There is started the creation of first Latvian on-line databases.Joint projects BALTINFONET and WEBNET, realized by Congress Library (Washington), RFE/RL Research Departament (Munich) and Baltic scientific libraries are aimed to this goal as well as.

It is necessary for succesful scientific information supply that in research libraries should work employees of high professional skill, the most progressive and qualified information specialists. Full academic education in librarianship and information science is possible to aquire in University of Latvia. Reorganization of higher education of information specialists is take place nowadays also, the academic study programs will be adapted to the changed situation. Postgraduate trainings for information specialists is take place also, courses "Searching strategy in STN databases" and "The INTERNET services" were organized in 1993. There are conducted trainings for users to exploit effective new information technologies also, similar courses are included in training of students of all specialities.

We have close contacts with the research libraries of Baltic region and other neighbour countries. LAL is a member of IATUL and IAALIS. Latvia is a member of International Center for Scientific and Technical Information also. We are considering the possibility to become a member of EAGLE.

There is fundamental improvement in scientific and technical information supply and management in Latvia today. We are sure that in near future it be possible for researchers and professors, for all the specialists of Latvia to have full modern information service.

App. 2.


USSR Science System
USSR
Academy of
Sciences
USSR
USSR
Ministry of
Higher Education
All-Union
scientific
institutes
All-Union
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Latvian
Academy of
Sciences
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Ministry of
Higher Education
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Institute
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University
University
To all institutions
To all institutions
USSR
Academy of
Sciences
USSR State
Commitee for
Science and
Technology
Latvian
Academy of
Sciences
Contracts
Sources of finansing

App 3.

State Scientific Institutions

1. Latvian Council of Science:
   - state policy of science - advices to government;
   - distribution of budget finanses;
   - expert commitees;
   - grants to scientific organizations (Academic Library, Publishing House, Botanical Garden, Nuclear Research Center);
   - grants to individual scientists and groups of scientists;
   - international represent of Latvian science.
2. Ministry of Education, Science and Culture, Department of Science and University Education:
   - register of state scientific institutions;
   - administrative direction of main state scientific institutes;
   - representation of science in goverment;
   - coordination of researches with ministries.
3. Latvian Academy of Sciences - public community of excellent scientists.
4. State scientific institutes:
   - under Department of science;
   - under other ministries.
5. Universities.

App. 4.

Fields of Research in Latvia (1994-1996)

1. Natural sciences.
   - 1.1 Physics (solid state, nuclear, atomic, magneto-hydrodynamics, astrophysics), mathematics.
   - 1.2 Chemistry (organic, medical, inorganic, physical.
2. Technical sciences.
   - 2.1 Computer science.
   - 2.2 Mehanics, energetics, engineering.
   - 2.3 Technical chemistry (wood, polymers, composits, plasma, metal anticorrosive, silicate).
3. Medical and Biological sciences.
   - 3.1 Ecology (forest and aquatic), geosciences, biology (botany, zoology).
   - 3.2 Molecular biology, mikrobiology, biotechnology.
   - 3.3 Medical research (cancer, immunology, cardiovascular, traumatology, public health).
4. Agricultural and forest sciences.
   - 4.1 Agricultural sciences (animal, plant).
   - 4.2 Forest researches.
5. Humanities and social sciences.
   - 5.1 Economics, law.
   - 5.2 History, archaeology.
   - 5.3 Languages, literature, folklore, music, theatre, art.
   - 5.4 Phylosophy, sociology, political sciences.

App. 5.

Nuclear Research Center

I. 5 MW water-cooled research reactor is only reactor in Baltic state used for research:

- core 20 kg 90% enriched 235U;
- vertical and horizontal experimental channels;
- metal loop with InGaSb alloy for gamma ray irradiation controlled by electromagnetic pumps (patent of the Institute of Physics);
- pneumatic system for delivery of samples in core (in few seconds);
- experiments, both with neutron and gamma irradiation can be carried out at temperatures down to 10 K (using liquid nitrogen and gaseous helium).

Reactor is used for:

- nuclear spectroscopy;
- neutron diffraction, neutron damage studies in solid state physics;
- isotope production;
- pollution studies, from neutron irradiation.

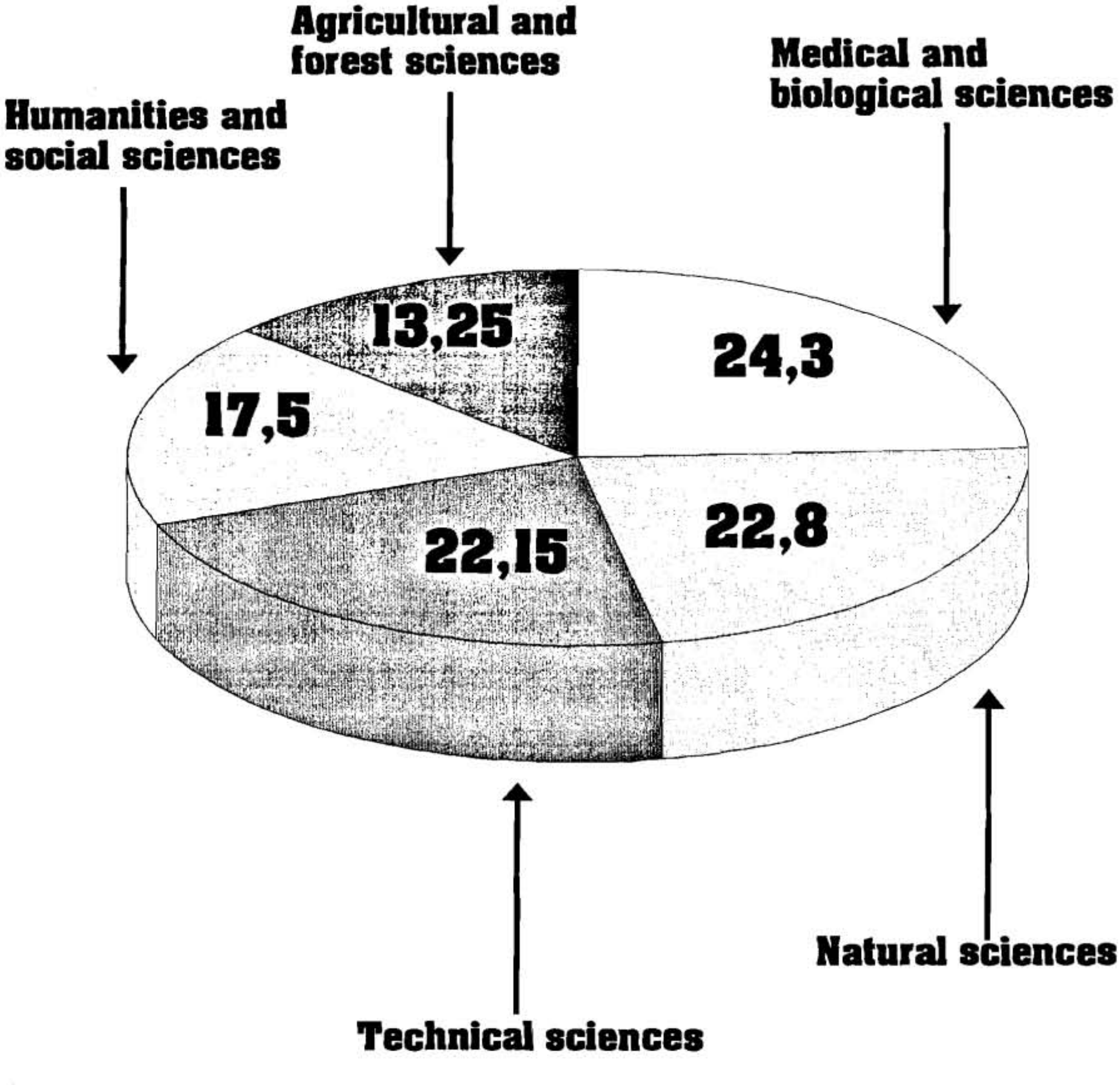
II. Production of isotope of technetium, used in medicine (half-life of 6 hours).

III. Small (25W) critical mass for study of reactor technology - possible installation of nuclear power plant in Latvia, unique liquid metal control system.

App. 6.

Budget of Latvian research 1993 - 5,1 mil. USD
(0.7% of total budget)

Finansing in 1994 (percentage shares):



App. 7.

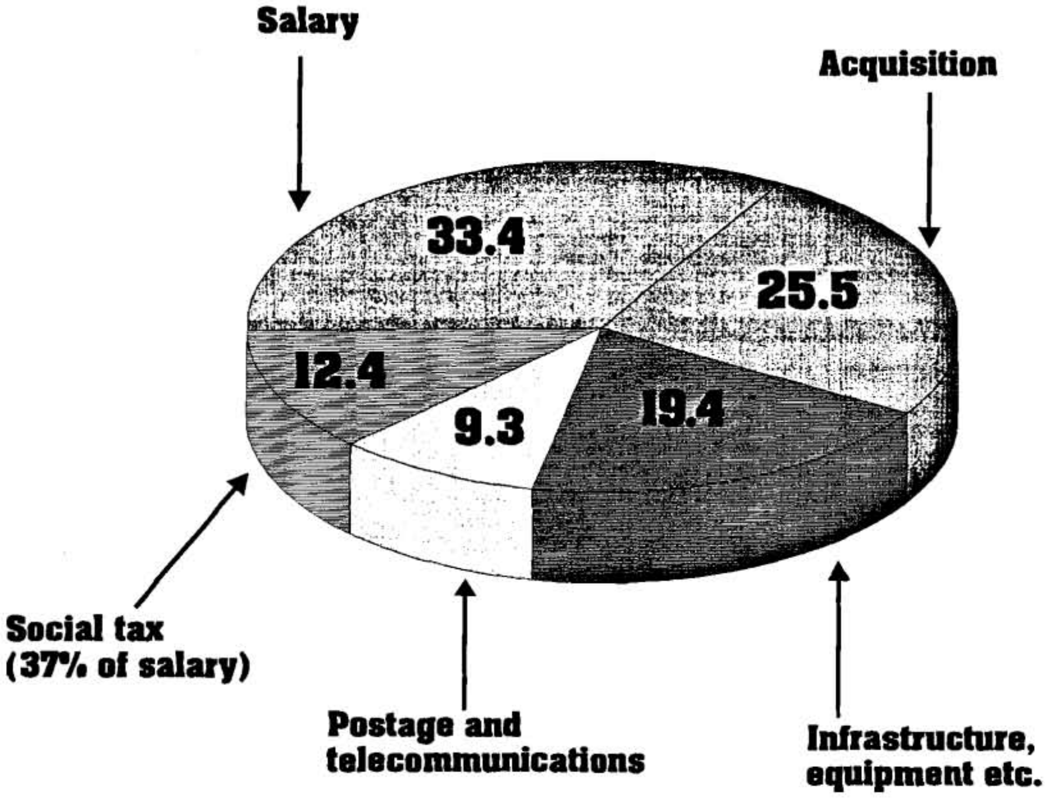
Latvian Research Libraries

	Acquisition	Budget clause
Latvian Academic Library	Scientific information in all fields 3.3 mil.	Science
University libraries: University of Latvia; Riga Technical University; University of Agriculture; Medical Academy etc.	Textbooks for students, some scientific books in corresponding fields Total 7 mil.	Education
Patents and Technology Library of Latvia	Patents, standards, technical descriptions and reports 20 mil.	Patents office
Scientific Medical Library of Latvia	Medical sciences and pharmacology 0.7 mil	Public health
Libraries in scientific institutions: Institute of Inorganic Chemistry; Latvian Institute of Cardiology; Nuclear Research Center; State Institute of Construction etc.	Literatura in corresponding fields Not great collections	Different
Latvian National Library	Humanities and social sciences Total 5 mil.	Culture

Financing of libraries
(1993, mil. USD)

Academic lib.	- 0.35
National lib.	- 0.63
Patents & Technol. lib.	- 0.20

Expenditures in Latvian Academic Library
(1993, percentage shares)



Expenditures for subscription to international journals in Latvian Academic Library

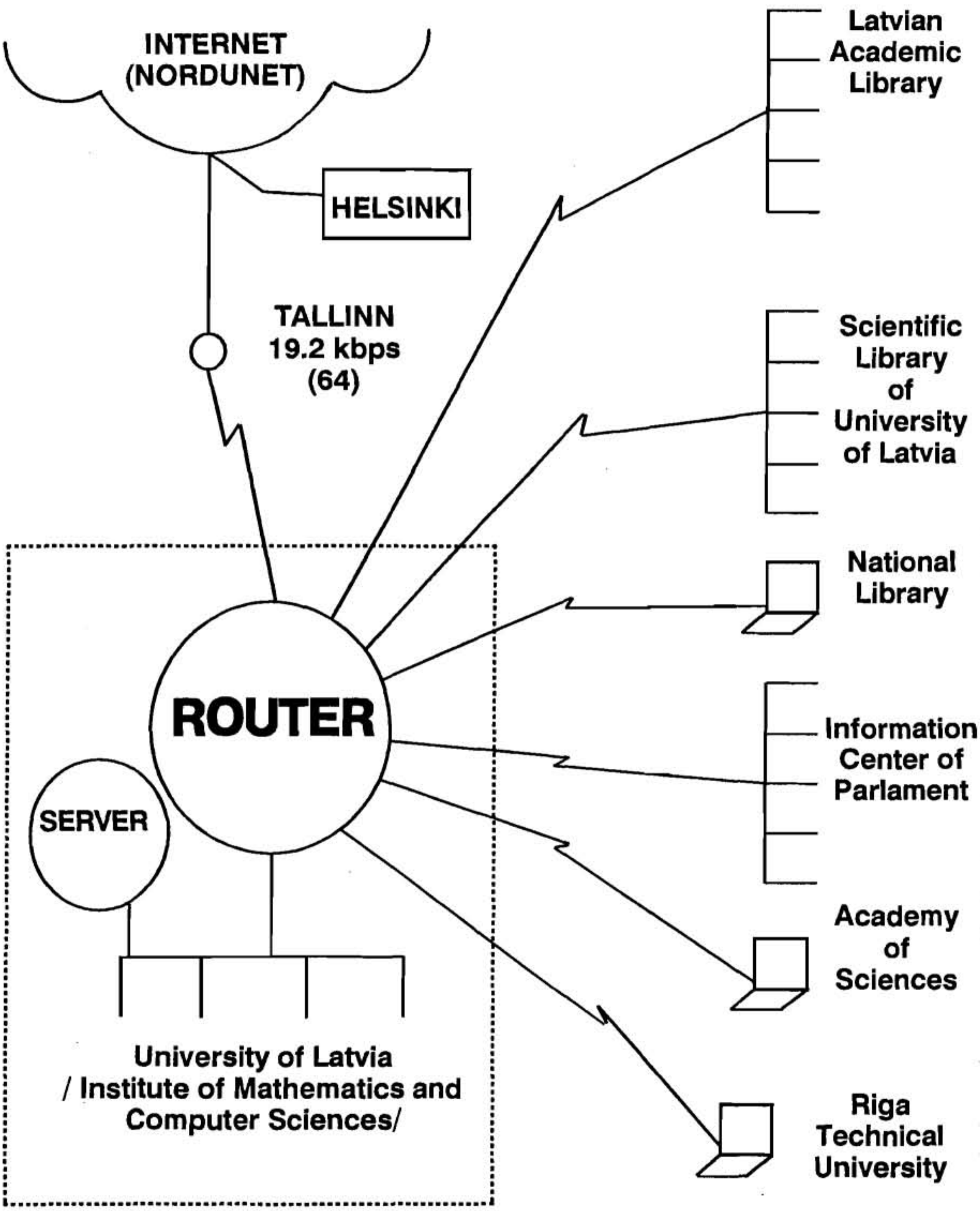
1991	-	0.33
1993	-	0.19
1994	-	?

Services of libraries

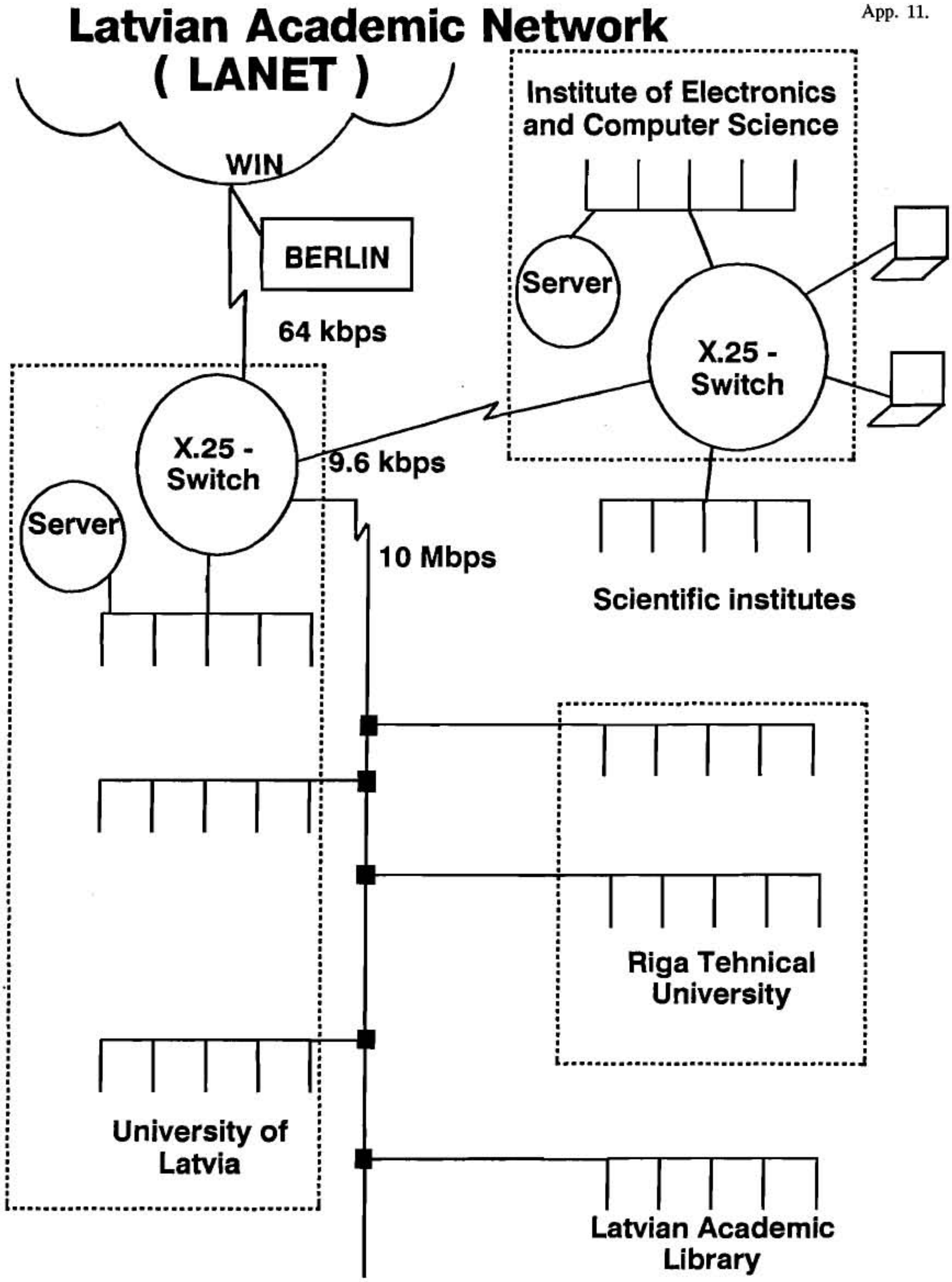
1. Categories of users, basic and extra services.
2. Cataloguing:
   - card catalogue - UDC;
   - electronic catalogue - MARC.
3. Library automation:
   - adaption of approved systems - *LAL,(NL,PTL);*
   - development of system - *LU.*
4. CD-ROM service - *LAL (LU,PTL).*
5. Reference and information service.
6. Indexes and bibliographies - *LAL, NL, PTL.*
7. Interlibrary loan - *LAL, NL, LU.*
8. Lending service *(except NL).*
9. On-line service - *LAL.*
10. Copying service.
11. Financial policy - free of charge and paid services.

App. 10.

INTERNET subscribers in Latvia



App. 11.


Latvian Academic Network
(LANET)
WIN
BERLIN
64 kbps
Institute of Electronics and Computer Science
Server
X.25 - Switch
9.6 kbps
X.25 - Switch
Server
10 Mbps
Scientific institutes
Riga Tehnical University
University of Latvia
Latvian Academic Library

Information Support of Nuclear Safety Problems

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1. Introduction

The world has changed after Chernobyl. And this change consists in the new open attitude to the problems of nuclear safety. The "wind of change" in the former communist countries also contributes to this. Because nuclear safety and radiation protection are categories closely connected with philosophy and morality, and they are strongly influenced by the socio-economical and political structure of the state.

In the case of Bulgaria the change in nuclear energy policy is expressed in expanding the role of the Bulgarian Regulatory Body, the Committee on the Use of Atomic Energy for Peaceful Purposes (CUAEPP). Now the safety of nuclear installations and radiation protection of personnel, public and environment are high priority tasks and primary concern of CUAEPP.

A more profound recognition of the importance of nuclear information management is another characteristic feature of this new approach. As a result a special information unit in CUAEPP was created based on the Bulgarian INIS Centre. Its main activities are: INIS input preparation, INIS output products utilisation, information retrieval with INIS CD-ROM DB, information service with other databases from the big hosts via direct access of the National Centre for Information and Documentation, full-text document delivery and library service with IAEA documents. Among these routine tasks our Information Department put special emphasis on information support in the field of nuclear safety and radiation protection. This report describes one of our attempts to synthesise the highly scattered data about information resources devoted to this subject area and thus to draw them nearer to our users.

2. Information Resources

Information about nuclear safety problems could be found in many of the numerous databases, commercially available on the market.

Most of the safety problems are purely practical, engineering, and even administrative. They need specific kind of information, which is available in other sources, mainly factual or numerical databases. The nuclear community is familiar with such sources of information created by IAEA - Power reactor Information System (PRIS), Incident Reporting System (IRS), Nuclear data System (NDS), Research Reactor Database (RRDB) , etc. Another big supplier of similar databases is OECD NEA. Very fruitful activity along these lines have Nuclear Regulatory

Commission, Washington, DC (US) and Japan Atomic Energy Research Institute, Tokyo.

There are, however, other sources, more or less unknown, that originate from different countries and organisations, whose subject scopes often overlap. Not all of them are widely accessible. Some contain restricted information, others are not intended for information dissemination on a broad scale. All of them could be very useful for exchange of experience among specialists.

The literature describing such kind of information systems is very scarce and scattered. The few reviews we found in our preliminary investigation [1] [2] cover only a small part of this subject area. So far there is no specialised directory or guidebook containing generalised data about them.

In order to promote the efficient use of these systems,. we decided to collect and generalise the available data about them. The first big "catch" was made by searching in INIS, the most complete specialised nuclear database covering more than 90% of the world nuclear literature. The search query (NUCLEAR SAFETY or RADIATION PROTECTION) and INFORMATION SYSTEMS was performed in INIS DB for the period 1987 - September 1993. There are 194 hits received. The subsequent manual selection and processing of the obtained document set narrowed the number of the hits to 102.

The closer examination of the collection revealed a very diverse mixture of systems. Besides typical documental, numerical and factual databases, there are computerised files of any kind, such as, or performing permanent surveillance and monitoring of the most important safety parameters, etc. In view of this great variety, we can use a more general term "information resources" when referring to them.

These information resources could be systematised in the following main groups:

- According to the type of the collected data:
  - Information retrieval systems with broader scope of usage (containing collections of data gathered from different installations and with some level of generalisation), such as Power Reactor Information System (PRIS), Incident Reporting System (IRS), European Reliability Data System (ERDS).
  - Information management systems for specific installations using elements of artificial intelligence. They are helping in decision msking, or are providing ready solutions for a standard critical situation. Very often they are integrated into the overall management and control philosophy of the particular plant. Examples of such systems are Industry Experience Advisor for Florida Power and Light Company of ABB Impel Corporation, Operator Aid Computer Systems (OACS) - US NRC, JOYO Operator/Maintenance Supporting System, PRNFDC, Oarai, Japan.

- Monitoring surveillance and warning networks. They give decisive criteria for the evaluation of nuclear accidents and a quick assessment for situations requiring the initiation of immediate warning procedures.Typical examples of these networks are IMIS, CEA Network for Radiactivity Measurement, Savanah River Site Environmental Management System.

■ According to the covered problems:
1. Seismic Networks
2. NPP Reliability Databases
3. Risk Assessment Systems
4. Structural Materials Ageing Databases
5. Nuclear Criticality Information Systems
6. Incidents Reporting Systems
7. Fire Protection Systems
8. NPP Operating Experience Databases
9. Operation/Maintenance Supporting Systems
10. Human Factors Information Systems
11. Safety Review Advisors
12. Environmental Radioactivity Surveillance Systems
13. Public Warning Systems
14. Emergency Management Information Systems
15. Geographic Information Systems
16. Earthquake Emergency Managing Systems
17. Radiological Information Management Systems
18. Occupational Exposure Information Systems
19. Off-Site Exposure Systems
20. Waste management Systems
21. Biomedical Control Systems
22. Radioisotope Applications Information Systems

This list embrace almost the whole life of a nuclear information - from siting to the waste managing.

3. Connection between Information Resources and Specific Nuclear Safety Principles

As it is well known, the nuclear safety concept is based on interconnected objectives and principles. The objectives state what is to be achieved, the principles state how to achieve it.

The General Nuclear Safety Objective is to "protect individuals, society and the environment from harm by establishing and maintaining in nuclear installations effective defences against radiological hazards" [3].

The General Nuclear Safety Objective consists in two mutually complementary and interdependent components:

- Technical Safety, having three main aspects:
  - to prevent accidents
  - to mitigate their consequences, should they occur
  - to assure that the likelihood of severe accidents is extremely small
- Radiation Protection, insuring that:
  - radiation exposure during the operation of an installation is kept below prescribed limits and as low as reasonably achievable (ALARA principle)
  - radiological consequences of any accidents will be mitigated.

These safety objectives practically permeate all the stages of the complex industrial activity of nuclear power production. They are observed throughout the whole life-span of an installation: siting - design- construction - operation - commissioning - operation - maintenance - waste management - decommissioning. In each of these technological steps safety objectives are implemented by means of specific principles, expressed in a complicated set of technical, procedural and administrative measures.

The complex coherence and interconnection between these principles can be seen on fig. 1. The life of the installation is presented from left to right in the order of progression of a nuclear plant project from the very beginning till plant decommissioning. Vertically, the schedule shows the specific safety principles in the order of increasing threat to safety, from normal operation of a plant to the occurrence of a nuclear accident, and progression from accident prevention to accident mitigation as defined in the defence-in-depth concept. The numbers to the right of the boxes show the corresponding groups of systems (according to the above classification) which provide information support to this specific activities.

This schematic presentation shows that some of the groups overlap each others' subject, that almost all of the safety problems are covered, and that a presence of "white fields", e.g. of problems which are insufficiently supported, if at all, by information resources.

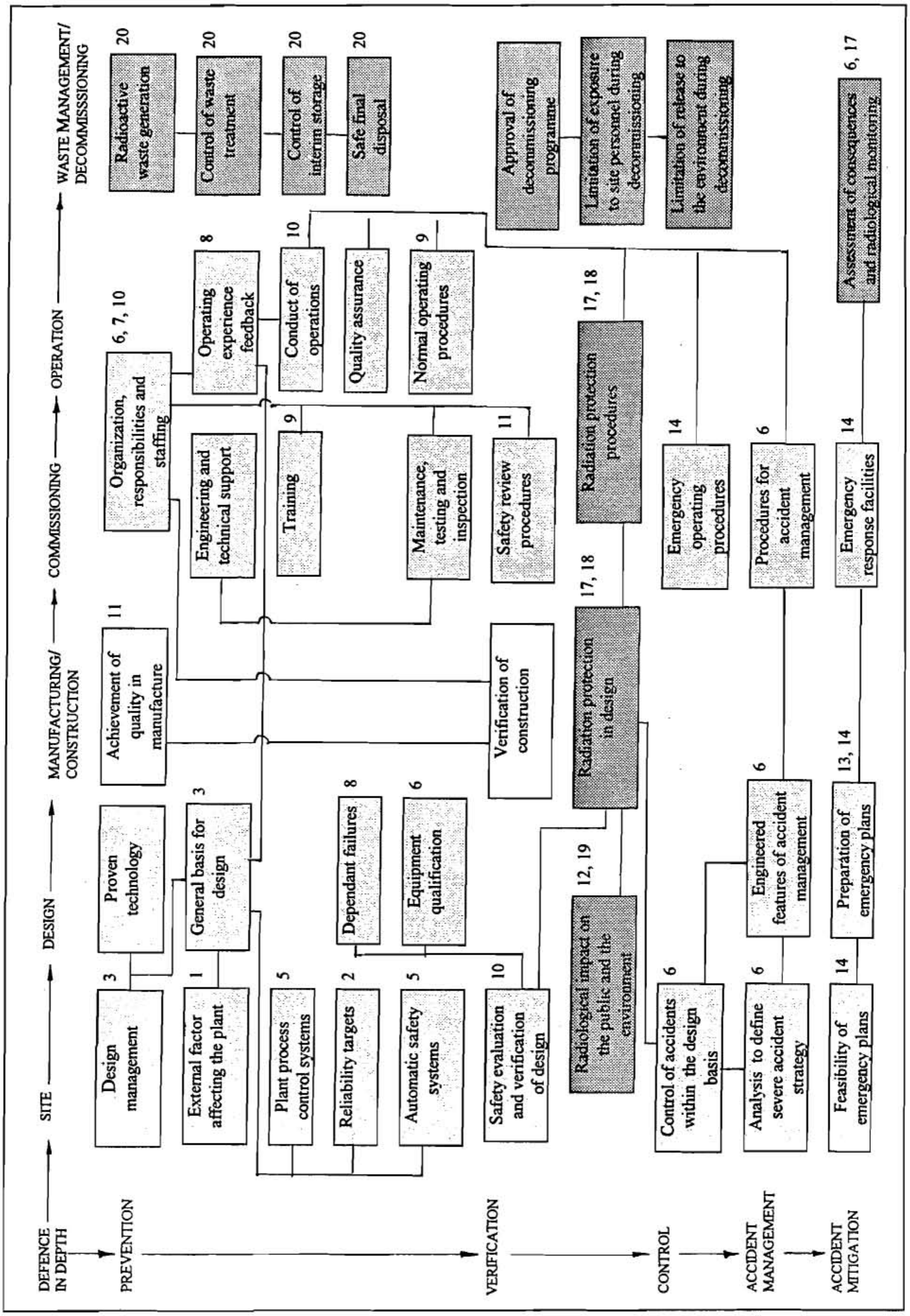

Fig. 1: Safety objectives of a nuclear power plant installation

4. A Concept of a Catalogue

The investigation of the collected material suggested the idea to create a kind of a catalogue, that can serve as an information guidebook for the potential users of nuclear information concerning the problems of nuclear safety.

Such Catalogue will contain data about each information resource presented in a "fact sheet" containing a complete set of its characteristic features. The Catalogue will be an expandable, hard-copy reference document. Further on it could be computerised.

The fact sheet will contain the following main parameters:

- Name
- Founding organisation (provider)
- General description
- Hardware
- Software
- Number of collected data items

5. Way of Access

This list will be flexible and could be shortened or expanded according to the available data. The data should be up-dated permanently in order to reflect the current status of the particular resource.

Examples of fact sheets are shown on fig. 2-4.

Name	**Bibliographical database of radiation biological dosimetry and risk assessment**
Funding organization	Department of Defence, Washington, DC (United States).
Description	The database is constructed to support research in radiation biological dosimetry and risk assessment. Relevant publications were identified through detailed searches of national and international electronic databases and through personal knowledge of the Subject. Publications were numbered and key worded, journal name, or publication number. The volume 11 contains 1048 additional entries, which are listed in alphabetical order by author. The predominating journals are Health Physics (242 citations in the database), Mutation Research (185 citations), Radiation Research (136) and International Journal of Radiation Biology (132).
Full text file	Photocopies of the publications contained in the database are maintained in a file that is numerically arranged by the publication acquisition numbers.
Number of records	2260 publications
Data sources	200 scientific journals, 80 books and published symposia, 158 reports
Hardware	Macintosh PC, with a capability to convert the files into the IBM PC version
Software	Sophisticated relational database program permitting quick information access, high flexibility, and the creation of customized reports. This program is inexpensive and is commercially available for the Macintosh and the IBM PC.
References	Bibliographical database of radiation biological dosimetry and risk assessment: Part 2. Straume,-T. et al. Sep 1990. 126 p. Available from INIS as UCRL--21107-Pt.2; OSTI as DE93009503; NTIS; US Govt. Printing Office Dep.

Fig. 2: Bibliographical Database of Radiation Biological Dosimetry and Risk Assessmant

Name	**NCIS - Nuclear Criticality Information System**
Funding organization	USDOE, Washington, DC (United States).
Description	Preserves and makes available the valuable unpublished records of critical experiment facilities. The material exists in the form of experimenters' logbooks, notes, photographs, material Description s, etc. The documents have been archived according to approved criteria and priority list of experiments. Data are used for validating calculations, for subcritical limits in standards, handbooks and guide, for understanding the physics of. criticality, facility design, for setting process limits, etc. A project for providing an NCIS image database using current CD-ROM technology is under way.
Access authorization	Unrestricted to nuclear criticality specialists
Type of access	On line
References	[1] The Nuclear Criticality Information System's project to archive unpublished critical experiment data. Koponen,-B.L. et al. In: International conference on nuclear criticality (ICNC) safety. Oxford (United Kingdom). 9-13 Sep 1991, 8p. Available from: INIS as UCRL-JC--105712; OSTI as DE92009427; NTIS; US Govt. Printing Office Dep. [2] The Nuclear Criticality Information System: An update. Koponen,-B.L.CA: Jul 1991. 10 p. Available from: INIS as UCRL-JC--105711; OSTI as DE92009525; NTIS; US Govt. Printing Office Dep.Contract W-7405-ENG-48
Status	Operational

Fig. 3: NCIS - Nuclear Critically Information System

Name	**US National Seismograph Network (USNSN).**
Funding organizations	National Earthquake Information Center (NEIC)at the US Geological Survey; US Nuclear Regulatory Commission.
Place of installation	National Earthquake Information Center (NEIC)
Status	Under development.
Description	The USNSN is a new US seismograph network for the US taking advantage of the modern technology. The network consists of approximately 150 seismograph stations distributed across the lower 48 states and across Alaska, Hawaii, Puerto Rico, and the Virgin Islands. The design goal for the network is the on-scale recording by at least five well-distributed stations of any event of magnitude 2.5 or larger in the continental US, Hawaii, and Puerto Rico, and of any event of magnitude 3.5 or larger in Alaska. The rapid access to all USNSN data is provided by the NEIC. This is accomplished both via a dial-up capability to the event waveform data base and by satellite transmission in a broadcast mode.
CD-ROM disks	Contain all earthquake data and are distributed to all institutions having an interest in the seismic data.
References	A national seismographic network for assessing seismic hazards, Masse,-R.P. et al. In: Weiss,-A.J.-Nuclear Regulatory Commission, Washington, DC (USA). Office of Nuclear Regulatory Research. Transactions of the seventeenth water reactor safety information meeting. Oct 1989. 186 p. p. 12.11. Available from INIS as CONF-8910222--Summs; NUREG/CP--0104 ; NTIS, PC A09/MF A01 as DE90000746.

Fig. 4: US National Seismograph Network (USNSN)

6. Conclusion

It is said that information industry of today is in chaos, because information access is not keeping pace with the rate of creating and accumulating information [4]. Even the most modern information technologies (image processing, multimedia, optical storage, etc.) focus on the accumulation of information, and not on a more intelligent retrieval engine instead. Being one more collection of data, our Catalogue also contributes to this state of chaos. Let's hope, however, that, at the same time, it will help to organise a small portion of this chaos - the field of radiation safety and protection. Because this lilt portion of our global chaos is very vital to the survival of mankind.

References

[1] Nuclear information: An overview of IAEA's activities. Marchesi, I.H.; Konstantinov, L.V.; IAEA Bulletin, Winter 1986, Vol. **28(4)** , p. 5-7.

[2] A review of emergency resaponse assisting systems by the OECD-NEA-CSNI group of experts on the concequences of accidents. Covaerts, P. Proceedings of 2. international workshop on real-time computing of the environmental concequences of an accidental release to the atmosphere from a nuclear installation. Vol. **1.** 1990. p. 3-23.

[3] The safety of nuclear installations. IAEA Safety Series No. 110, Vienna, 1993, . 27 p.

[4] Basic Safety Principles for Nuclear Power Plants. IAEA Safety Series No. 75-INSAG-3. Vienna, 1988, 74 p.

[5] Preparing for the information revolution: excerpts from the keynote address, 1993 National Online Meeting, Frappaolo, C..Online & CD ROM, June 1993, vol. **17(3)**, p. 181-185

Databases on Nuclear Safety, Radiation and Environmental Protection Maintained in Atominform of Minatom of Russia

Y. Reshetjko, V. Astakhov
Atominform, Moskau

Experts in information systems, primarily information management, are well aware of the problems to be solved at all stages of system's life cycle.

Therefore, my presentation is structured in such a way as to highlight, in more or less detail, the entire range of problems related to the activities of Atominform in this area.

1. Information Users

They are primarily the top managers and specialists of the Ministry of the Russian Federation for Atomic Energy (Minatom of Russia) who are directly responsible for the solution of managerial problems of nuclear industry.

Appendix 1 shows the topics and directions of the information support which are of interest to the Committee for Ecology, Safety and Emergency Situations of the Minatom of Russia.

The managers and specialists of industrial enterprises, design establishments and research institutes of the Minatom of Russia and other industries are also interested in this information.

In addition, specialists of state bodies, regional and local authorities, representatives of political parties and public movements frequently refer to the above information.

2. Qualitative Characteristics and Classification of Information Flows

The subject under consideration relies both on scientific and technical information in its classical form (journal articles, monographs, reports, reference literature, standards, publications of various companies, etc) and information of accounting and statistical, managerial and regulatory nature (state statistical reports, laws, decrees and other acts and regulations, texts of state programs, etc).

Some problems require information directly related to production activities of certain enterprises and their personnel (data on radiological situation, dose burdens, time and routes of personnel movements in production premises and on the sites of enterprises, etc).

The interest to newspaper publications, publicism, popular articles has grown recently.

There is another method for classifying the information flows: classification in the so called "upward" and "downward" flows. Here, in the first case, we deal with information which is generated by the enterprises and organizations of the nuclear industry and is transferred at the horizontal level either to the top management of the nuclear industry or beyond the boundaries of the latter.

The "downward" flow is primarily formed at the expense of scientific and technical information produced by the leading information centers both in Russia and elsewhere as well as at the expense of information products of the leading research institutes, research centers, companies, enterprises.

Finally, the third method of classification is directly related to conversion of information during its processing and distribution among the end users.

For example, the flow of originals is transferred into the microfiche fund with reference and retrieval facilities; in addition, analytical processing and compression of information enables production of abstract and analytical reviews. Appendix 2, as an example, contains the list of some reviews published by Atominform within the scope of its scientific seminars.

3. Basic Lines of Activity our Related to Establishment of Information Funds and Databases in the Minatom of Russia

An objective need in certain scientific and technical information underlies the establishment of any information fund or database.

The activities of Atominform reflect adequately these objective requirements. It proceeds from the fact that Atominform is entrusted with both elaboration and information support of state and industry programs on nuclear and radiation safety, environmental protection, radwaste reprocessing and disposal.

These programs include the State Program of the Russian Federation of Radwaste and Spent Nuclear Materials Management, Their Utilization and Disposal for 1992-1995 and in the Perspective up to the Year 2005 as well as the Comprehensive Program of Ensuring Safety of Population and Installations of Nuclear Power Industry.

Atominform coordinates the process of establishing databases within the system of the Minatom of Russia under the currently developed program of informatization of nuclear industry.

X-ATOM telecommunication network is being established within the scope of the above program.

In 1994-1995 the industry plans to undertake a wide range of activities related to the setting up of databases, including DBs on:

- ❑ environmental conditions and radiation safety of industrial enterprises;
- ❑ ecological monitoring of the sites and adjacent territories;
- ❑ inventory of the sources and types of hazardous chemical releases into the atmosphere;
- ❑ inventory of the sites of storage and disposal of toxic and radioactive waste;
- ❑ data on quantities, characteristics, sources and movement of waste, waste management techniques and equipment for waste treatment, waste storage and disposal sites;
- ❑ accounting for contaminated and rehabilitated territories;
- ❑ calculations of population exposures as a result of anthropogenic contamination of the environment;
- ❑ physical and chemical properties, regulatory requirements, and methods of control over hazardous substances.

These works shall be carried out via a wide cooperation of the enterprises and establishments of Minatom, Ministry of Environmental Protection and Natural Resourses, State Committee for Chernobyl Accident Recovery, Ministry of Health of Russia.

Numerous targeted databases are set up to support the current operations of the enterprises; these DBs can be used for solving the problems of nuclear safety, radiation and environmental protection.

The databases on corrosion resistance of structural materials at the Sverdlovsk Research Institute of Chemical Engineering, database of the ISOTOPE Association for accounting sealed ionizing radiation sources as well as devices containing such sources, a similar database of NUCLIDE Center in St.Petersburg can be used as an example.

4. Interaction with Extraindustry Information Systems

Irrespective of certain specific features, the enterprises and institutions of the Minatom of Russia are a part of Russian national industry and produce their own effect on ecological situation in the adjacent regions as well as the enterprises of other industries. It can be easily seen on the following examples.

Atominform takes an active part in the establishment of databases, including ecological information, which is undertaken under the direction of the Ministry of the Russian Federation for Science and Technical Policy.

Therefore, there are many problems of general nature which require ecological information from extradepartmental information centers.

Indeed, should we exclude the radiation impact problems, then the enterprises of the Minatom of Russia feature the same environmental impacts as machine-building, metallurgical, mining, instrument engineering, chemical, agricultural, and construction enterprises.

A peculiarity of ecological information resides in its extremely high dispersed nature. Environmental protection R&D are carried out practically in all areas of science and technology. At the present time, there are over 10,000 periodicals in the world which deal with ecological problems. There is about one thousand organizations involved in these problems in Russia alone. Among them are research institutes, universities, monitoring laboratories, divisions of the State Committee for Meteorology, scientific and technical information bodies, military and industrial establishments, various agencies.

The integration of the accumulated information resources into a common automated system of ecological information, which will represent a network of several hundred automated information subsystems distributed over the territory of the country and subordinated to various departments and agencies, can be viewed at present as a strategic objective.

The first step towards the establishment of a common automated system of ecological information is the inventory of the available information resources in the field ecology and environmental protection as well as the setting up of meta-databanks as a system-forming component of DB industry in the country.

Meta-databanks shall be formed on a voluntary basis, and, such being the case, information generators shall submit to the meta-databank the information on the available databases in certain format, maintaining all rights for their products. Thus, meta-databanks fulfil the reference function, addressing the users to a relevant DB.

INFOTERRA database of the All-Russia Research Institute of Scientific and Technical Information (which is, at the same time, a UNEP international environmental information system) can be used as an example of meta-database; the INFOTERRA DB contains information on 6,000 organizations of ecological profile (including 120 Russian establishments) and their information services.

The meta-databank of the All-Russia Research Institute of Interdepartmental Information contains data on seven bibliographic and 40 databases containing actual data on environmental protection and rational utilization of natural resources.

The meta-databank of the Information and Calculation Party Center under the All-Russia Scientific, Technical and Information Center contains 15 bibliographic DBs on the same topics. A demonstration CD-ROM with 8 DBs is to be produced in the late 1993. Given a positive response of the users, a required number of these DBs will be published in 1994 along the following directions:

- ❑ environmental protection and regeneration of natural resources;
- ❑ protection and improvement of urban environment;
- ❑ human ecology;
- ❑ systems, instrumentation and methods of environmental quality control and monitoring;
- ❑ legal aspects of environmental protection;
- ❑ resource-saving technologies.

Demonstration disks in the Russian language will be demonstrated in some western information centers and libraries. Should western partners want to buy such databases, the latter will be translated into English and the databases will be offered for the western markets.

Atominform is currently preparing about 28,000 of records from the SARI (automated information distribution system) database of the nuclear industry for recording on CD-ROMs.

5. Examples of Databases

5.1 Documentary Databases

Atominform, as an information center of the Minatom of Russia, fulfills the basic functions of information support of the nuclear industry, including establishment and maintenance of wide-profile databases of scientific and technical information.

These databases are formed both at the expense of the own input into the SARI (automated information distribution system) and through acquisition and processing of databases of the extraindustry centers (All-Russia Research Institute of Scientific and

Technical Information, All-Russia Scientific, Technical and Information Center, All-Russia Institute of Interdepartmental Information, etc) on magnetic carriers as well as utilizing foreign CD-ROM information. Information from INIS DB is an important component.

The technology based on INIS philosophy and regulations is used to input the data because Atominform is the National INIS Center of Russia. At the present time, ISIS software package, including PC-application, is adopted as a basic package for processing and retrieving documentary information and for setting up local problem-oriented databases.

A system of converters, ensuring conversion of information into the internal format of the ISIS package is developed and used for adopting different databases.

Necessary facilities are developed for maintaining PC thesaurus.

At present, the scope of selective distribution of information is being gradually reduced under simultaneous transition to the retrospective database retrieval.

Promising is the establishment of problem-oriented databases which can be offered to the end users. The following topical collections have been made:

- Chernobyl Accident After-Effects and Recovery;
- Assessment of the Forecasts of Environmental Conditions and Natural Resources, Including Monitoring Systems;
- Radioactive Contamination of the Environment;
- Legal Aspects of Environmental Protection.

5.2. Automated Information System on Radiological Situation within the 30-km Zone of the Chernobyl NPP ("Radiological Situation" AIS)

The automated information system was aimed at integrating uncoordinated data of various organizations on radiological situation in the 30-km zone of the Chernobyl NPP; at establishing a common machine-readable verification database and at developing software facilities to ensure a fast and convenient search for and retrieval of data for their examination or mathematic processing.

The software complex of Radiological Situation AIS enables the following functions:

- input of information into the database (controlling the input data);
- correction of information stored in the database (replacement and deletion of values in the record fields);
- display of the retrieval results on the screen of the monitor;
- print out of data;
- creation of data files.

Radiological Situation AIS is implemented by a PC/XT/(AT) type personal computer with 640KB RAM, 20MB HDD, color monitor and matrix printer.

Reports on radiological situation surveys within the 30-km zone of the Chernobyl NPP for the period from May 1986 to December 1987 were the information sources of the database.

The AIS's database contains information on 5000 measurements of radioactive contamination in 1500 odd inhabited localities. It consists of two principal and 5 auxiliary sets of data. The first principal data set contains information on gamma-radiation exposure dose rate (EDR) and total radioactivity, while the second one - information about radioisotopic composition and radioactivity of individual radionuclides.

Each record from the first principal data set contains information on the taken sample: number of the sample, type of the sample, sampling sites, date of sampling, EDR, total radioactivity and measurement units of the latter.

The records of the second principal data set contain data of the analysis of sample radioisotopic compositions: number of the sample, code of the element, element's radioactivity. The link between the second and the first principal data sets is established through the number of the taken sample.

Values in certain fields of the principal data sets are coded. To enable an intelligent retrieval rather than retrieval based on code sets, the information system uses a number of dictionaries. They include: dictionary of inhabited localities, dictionary of clarifications of sampling sites, dictionary of the types of samples, dictionary of measurement units and dictionary of the names of radioactive isotopes.

Fig 1 shows the screen during data input and correction.

Retrieval of data from the database is implemented through a filter assigned by the user. The filter can contain any combination of the required values in the record fields.

The selected data can be displayed on the monitor, printed out or integrated in a special independent data file for subsequent processing.

Fig. 2 shows the screen during data retrieval and selection.

Fig.1

Dorochin
Drunki
Dublin
Dubnets
Dubrovka
Dubrovnoye
Dubrovo
Dyatlik
Eljsk
Zhellabor
Zhelonj
Zherdnoye
Zhovtnevoye
Zhurba
Zaborie
Zavodsk
Zalesie B
Zalishany
Zamatie B

General Data	
Radioactivity type:	1
Analysis date:	01.11.86
Sample type:	4
Measurement unit:	2
Degree indicator:	0
Document No.:	3001
Sample data	
Sample No.:	11368
Inhabited locality:	Zhellabor
Sampling site:	100m s-w of the locality
Sampling date:	28.10.86
Radioactivity:	86.700

<F2> - list of inhabited localities; <F3> - list of measurement sites
Cursor positioning - ,,<PgDn>, <PgUp>; Selection - <Enter>

Fig.2

RADIOLOGICAL SITUATION IN THE 30-KM ZONE OF THE CHERNOBYL NPP

Pristanskoye	V G
Prosmychi	G
Puchin	G
Radin	G
Radomlya	G
Radcha	G
Radcha-Viljcha	G
Razeszhiye	VG
Rassokha	VG
Rafa	G
Rafalov	
Rafalov "c"	.
Racvovka	G
Repizhe	
Rechitsa	VG
Rechki	
Rovkovichi	

Measurement Site	Measurement Date	Content (Ci/km^2)
W.outskirts	25.06.86	5.30
Center	25.06.86	25.70
S.outskirts	25.06.86	36.00
E.outskirts	25.06.86	7.60
50m sw c.i.l.	08.07.86	63.00
70m sw c.i.l.	08.07.86	16.00
60m sw c.i.l.	08.07.86	55.00
50m sw c.i.l.	08.07.86	13.70

Data End. Press any key

5.3. Automated Catalogue of the Documents of the Committee for Chernobyl Accident Recovery

The Automated catalogue contains information about 500 documents of the Committee for Chernobyl Accident Recovery of the former Soviet Union and provides for a prompt and convenient retrieval of documents using various requisites, and reference information on the quantity and numbers of the microfiches used as storage media.

The software complex of the Automated catalogue fulfills the following functions:

- input of document names and information about their locations;
- formation of key words vocabulary;
- retrieval of documents using different requisites;
- print out of the names of the selected documents and information on their locations;
- print out of key words vocabulary and its frequency characteristics.

5.4. Database of the Participants of the Chernobyl Accident Response and Recovery

This database was set up by processing the documents worked out during the Chernobyl Accident response and recovery and contains identification data on the participants, exposure period and dose, registration number.

This database contains information on 30,000 persons seconded from the enterprises of the Minatom of Russia.

Fig.3 below presents a fragment of this database.

Fig.3

000006

Full Name: ------------------------------ Khabarov Yuri Grigorievich
Register number:-- 27263
Inventory number: --- 3147
Exposure year: --- 1986
Radiation dose: -- 1,2
Year of birth: -- 1935
Passport data: ----------------------------------- VII-TN No.569102
Seconding organization: ------------------------------------- US-909
Established exposure period: --------------------- 13.08.86 - 30.09.86

000007

Full name:-------------------------- Khabibov Aleksey Satvoldievich
Inventory number:-- 415
Exposure year:-- 1987
Radiation dose: --- 21,15
Seconding organization:------------------------- PMK-29, Kizil-Kiya
Established exposure period: ---------------------- 10.08.87 - 02.10.87
Established dose: -- 21,51

A full-scope copy of this database was transferred to the Institute of Medical Radiology in Obninsk which maintains the All-Russia Register of Persons Suffered from the Chernobyl Accident as well as to the PRYPYAT Research and Production Association in the Ukraine.

The establishment and maintenance of this database was necessitated by the relevant laws of Russia and the former USSR which granted privileges and benefits to the persons suffered from the Chernobyl accident, and the persons participated in the Chernobyl accident response and recovery receive relevant certificates from one of the Atominform's divisions functionally responsible for archive maintenance.

5.5. R&D State Registration and Accounting Information System

The System of State Registration of and Accounting for Research and Development, including the system of nuclear industry, is aimed at compiling reference-information fund of research and development as well as theses for maximum utilization of the results of the completed works; provision of references on similar R&D; performance of analyses of research and production activities in nuclear industry, and also for provision of address information about developing establishments for establishment of direct contacts in order to assimilate and introduce R&D results.

The Reference and Information Fund of nuclear industry contains data on in-progress and completed R&D, technologies, materials and products manufactured by the enterprises of nuclear industry within the scope of R&D programs.

The Atominform's Fund of R&D State Registration and Accounting contains over 1000 reports with R&D findings about the environmental impacts; biological and agricultural recultivation; reprocessing and utilization of liquid and solid waste; radiological situation on the industrial sites, test sites, territories, water reservoirs; results of storage facility testings; investigations into possible after-effects of major accidents at NPPs; management of agriculture, forestries, and water handling facilities under conditions of radioactive contamination; results of studies on radioecological, radiation health and socioeconomic after-effects of radioactive contamination of large territories; behavior and migration of radiobiologically significant nuclides; decontamination of dwelling, territories, agricultural lands, equipment, etc.

The software complex of the "State Registration" Automated Information System enables the following functions:

- input of information into the databases;
- updating of the stored information;
- inverted retrieval of information using key words, integrated program codes, subject categories as well as retrieval using the text of 24 fields of document description;
- display of retrieval results;
- print out of data;
- export and import of DB fragments on machine-readable carriers in ISO format.

The "State Registration" AIS functions within the framework of Novell type network. The package can be used at any IBM-compatible computer. The software is based on CDS/ISIS/M version 3.0.

Examples of documents are given in Appendix 3.

Database on Non-Radioactive Substances Discharged into Water and Air

Annual processing of reports in compliance with state statistical reporting requirements enables the maintenance of the following databases on the quantities of hazardous (non-radioactive substances) discharged in water reservoirs and air by the enterprises of the Minatom of Russia.

1. Basic data on the quantities and chemical composition of effluents discharged into water reservoirs by the enterprises of the Minatom of Russia.

2. Data on the quantities and composition of effluents discharged into various water basins (basins of the Baltic Sea, Black Sea, Caspian Sea, Arctic Ocean and the Pacific).

3. Data on the quantities and composition of effluents discharged into water reservoirs on various territories (subjects of the Russian Federation - republics, territories, regions, cities of federal importance, autonomous districts).

4. Aggregate data by the enterprises of the Minatom of Russia on the quantities,composition and phase state of releases into the air.

5. Data on the quantities and quality of releases into the air of various territories.

There are 3 arrays of information as of the late 1993: for 1990,1991, 1992.

The information can be presented on floppy magnetic disks or paper carries of FOXBASE or FOXPRO DBMS-applied software packages.

The above databases can be used in two ways:

- First, as the results of original ecological monitoring to assess the environmental damage inflicted by the enterprises of the Minatom of Russia;
- Second, as information on industrial waste which can be potentially recovered and utilized. In this case additional information is required on the type of the "source" (its configuration, material, output cross section), phase state of released materials and their concentration in the total volume of effluents, discharge intensity and periodicity.

Appendix 4 shows the menu which will enable You to receive necessary information from this database.

Appendix 1

The topics and directions of the information support

1. Information (analytical review) on nuclear industries of foreign cointries (NPPs, nuclear fuel cycle facilities, industrial reactors, etc)

2. Structures of supervising and regulatory authorities in the area of nuclear safety in the countries with nuclear installations and nuclear fuel cycle facilities

3. State of natural environment (levels of atmospheric air, water sources and soil contamination) in various regions of Russia, including radioactive contamination

4. Impact of nuclear and power industry enterpises on the environment

5. Experience in arranging environmental protection efforts in the towns of nuclear industry

6. Introduction of economic methods in the nature-conserving practice of the CIS member-states. National and international experience, including penalties for environmental contamination comprising radioactive releases and discharges

7. Environmental protection management: national and international experience. Status

8. Status of and prospects for development and introduction of methods and facilities of ecologically safe localization and disposal of radwaste: national and international experience

9. Ensuring NPPs' safe operation: status and prospects, assimilation of the advanced domestic and foreign experience in the practice of national NPP operation. Improvement of methods reducing ingress of radioactive substances into the environment (including iodine problem), in emergency situations as well. Modern instruments and decontamination installations

10. Establishment of levels of radioactive releases and discharges into the environment for nuclear fuel cycle facilities: standards and principles of calculations, legislation, rules and regulations (national and international experience)

11. Development and introduction of low-waste and effluent-free technologies, production processes and efficient methods of trapping and neutralizing contaminants in releases and effluents at the enterprises of nuclear industry

12. Development and introduction of systems and instruments of efficient control over ingress of contaminants in the environment, and ecological monitoring at the enterprises of nuclear industry

13. Standards and rules of environmental protection, applicable nature-conserving laws

14. Levels of traumatic injury, basic causes, preventive measures in various industries of the Russian Federation, foreign countries, including the CIS member-states

15. Occupational diseases - types, levels, causes, preventive measures in various industries of the Russian Federation, including the CIS member-states

16.Applicable rules and regulations of labour safety covering the entire spectrum of production activities in various industries of the Russian Federation and foreign countries, including the CIS member-states

17.Leagally established maximum permissible concentrations of hazardous chemical agents in the air of production premises; methods and equipment of their control in variuos industries of the Russian Federation and foreign countries, including the CIS member-states

18.System of personnel insurance against occupational traumatic injuries and diseases (state, industry, trade-union and other) in Russia, CIS member-states and foreign countries

19.National radiation safety systems of the leading foreign countries (legislation, basic radiation safety standards and regulations, organizational-legal structures, solution of social problems related to compensation of damages, etc)

20.Ensuring radiation safety of individual operations and various technologies and facilities (protection means, approaches, organization of operations, etc) in the leading foreign countries

21.Methods of dosimetric and radiometric control and applied equipment (instruments), new developments in this area in the leading foreign countries

22.Exposure of personnel involved in different operations with radioactive substances, radiation sources, radiationally hazardous installations and facilities related to the uses of nuclear power, manufacture and testing of nuclear weapons in the leading foreign countries

23.Emergency situations associated with enhanced radiation impact on human beings and environment; their causes, after-effects, response, recovery and preventive measures in foreign countries, including the CIS member-states

24.Activities of state authorities, leading research and development institutions of the Russian Federation and CIS member-states in the area of radiation safety (development of guiding documents, draft laws, regulations anf rules, etc)

25.Activities of international organizations in the area of radiation safety - IAEA, ICRP, UNSCEAR, ILO, WHO (international recommendations, reports, reviews, publications, etc)

Appendix 2

LIST OF REVIEW AND ANALYTICAL MATERIALS ON SAFETY, ECOLOGY AND EMERGENCY SITUATIONS

1. Nuclear disasters, their after-effects and prospects of nuclear power (review)

2 Assessment of accident probability at foreign NPPs and methods of mitigation of their impact (safety of NPPs with PWR reactors) (review)

3. Safety assessment of radwaste final disposal (review)

4. US DOE program of environment recovery and waste management (analytical reference)

5. Environmental impact of uranium plants' waste (review)

6. US DOE activities related to rehabilitation of the environment of the nuclear-industrial complex (program management structure finance, decontamination of sites, soils, underground waters). EPA structure (review).

7. Ecological after-effects of the operations of USA production complexes (review)

8. US DOE long-term program of rehabilitation of contaminated territories and radwaste management

9 Comparative analysis of ecological impacts of NPPs, coal-fired power plants abroad (report)

10. Dynamics of personnel and population exposure dose reduction during the operation of NPPs

11. Modern techniques and facilities of monitoring hazardous chemical effluents of enterprises

12. Arrangement and methods of mitigating the after-effects of nuclear accidents abroad

13. Mehtods and technology of decontaminating the soils contaminated with radioactive and hazardous chemical agents

14. State legislation and organization of efforts ensuring operation safety of nuclear installations in USA (review)

Appendix 3

An Example of Documents in the "State Registration" Fund

000033
Map type: .... RK
SR No.: U63758
Inventory No.: 794
Receipt date: 13.02.90
Subject category: 0807, 0511
Project title: .... Investigation into a possible application
.... of ultrasonic radiators in household washing machines
Program code: 22
Project code: 03-04
Nature of work: 0-00.03-04-02.89-4373P
Type: .... research
Input information: 0
SR/A code: 17
Price (thousand roubles): 44.00
Startup date: 01.07.89
Completion date: 30.06.90
Reg.No. 66563
Input date: 03.09.90

Abstract: There will be conducted: investigations into a possible application of ultrasonic radiators; problems related to the establishment of ecologically pure household washing machines; selection of optimal design for prototype development

000058
Map type: .... IK
SR No.: U17326
Inventory No.: 1399
Receipt date: 21.12.89
Subject category: 0207, 1003
Project title: Systematization; Accounting for and analysis of
technological situations during the operation of gas
decontamination system at the Leningrad NPP in 1987-1988
Program code: 8
Project code: 13-02
Nature of work: 1-00, 13-02-01.85-0984P
Type: .... research
Information on publication:
Document information: .... Paper was not published
Receipt information: 1
SR/A code: 20
Executing organization: 146
Type of distribution: .... free of charge
Price (thousand roubles): 0.00
Startup date:
Completion date:
Reg.No.: 66639
Input date: 10.09.90

Abstract: Presented are the results of investigations into a process gas decontamination system at LNPP-2 carried out in 1987-1988 in order to analyze the efficiency of its operation. Basic investigation methods: spectrometric measurements of isotopic composition of the gases contained in the gas mixture subject to decontamination along the production process chain and test experiments via radioactive labelling (krypton-85) of carbon adsorbents. The sources of nonphysical values of holding time of working gases produced in the process of standard control of the facility's efficiency are analyzed. The conditions of applicability of calculated expressions are analyzed. Dependence of decontamination factor on non-stability of the parameters of the gas medium subjected to decontamination is shown. Adsorption characteristics of active coals SKT-3S which were in the process and in the reserve since the startup of the facility are studied. A new method of system's efficiency control based on mutually correlation function of indicating isotope's activity is proposed; xenon-138 can be used for this purpose. Economic aspects of gas decontamination are discussed; economic damage inflicted by the releases of the LNPP-2 to the entities of national economy located in the vicinity of the LNPP is estimated. A criterion is proposed for estimating profitability of ecological equipment application. Conclusions and recommendations are made.

Appendix 4

Contaminants	Territories	Basins	Exit

Contaminants	Territories	Basins	Exit
WATER			
AIR			

Contaminants	Territories	Basins	Exit
WATER			

✓ **Ammonia nitrogen**
Total nitrogen
Aluminum
Bromides (Bromide-ion)
Sodium dichloroacetate
Total iron
Cadmium
Calcium
Magnesium
Manganese
Copper
Sodium
Nickel
Nitrides
Perchloroethylene
Calcined residues
Dissolved salts

Contaminants	Territories	Basins	Exit
WATER			

✓ **Ammonia nitrogen** **Total**

ENTERPRISE	Discharges intoreservoirs
ALMAZ Production Association	
Argun Production Mining and Chemical Amalgamation	
Malyshev Mining Department	
"Chepetsk Mechanical Plant" Production Association	
"Volga Machine-Building Plant" Production Assication	
Baikal Mining and Dressing Combine	
MAYAK Production Association	
Urals Electrochemical Combine	
Siberian Chemical Combine	
Mining and Chemical Combine	
Electrochemical Plant	
Kirivo-Chepetsk Chemical Combine	
Research Institute of Experimental Physics	

Contaminants	Territories	Basins	Exit
AIR			

1,6-hexamethylenediisocyane
Aluminum oxide (abrasive dust)
Nitric acid
✓ **Acrylonitryl**
Acroleine
Butyric aldehyde
Trichloroacetic aldehyde
Alfa-methylstyrene
Alumunim and its other compounds (in terms of aluminum
Anylacetate
Alyphatic amines
Ammonia
Ammonium carbonate
Ammonium nitrate
Ammophos
Maleic anhydride (vapours, aerosol)
Aniline
Apatite

Contaminants	Territories	Basins	Exit
AIR			
✓ **Acrylonitryl**	**Total**		

ENTERPRISE	Releases into atmosphere
KAUCHUK Plant	
ELEKTROCHIMPRIBOR Combine	
MOLNIYA Machine-Building Plant	
Urals Electrochemical Plant	
SEVER Production Association	
ATOMMAS Production Association in Volgodon	
IMPULSE Plant	
ATOMENERGOZAPCHAST Production Association in Novo Voronezh	

Contaminants	Territories	Basins	Exit

Altai Territory
Archangelsk Region
Astrakhan Region
Bashkordostan
Vologda Region
Voronezh Region
Dagestan
Ekaterinburg Region
Ivanovo Region
Irkusk Region
Kaluga Region
Karelia
Kirov Region
Kostroma Region
Krasnoyarsk Territory
Kurgan Region
Kursk Region
✓ **Leningrad Region**
Magadan Region

Contaminants	Territories	Basins	Exit

✓ **Leningrad Region**

TOTAL FOR THE TERRITORY
Leningrad NPP
Research and Technological Institute
Nothern Construction Department
Sosnovi Bor Machine Building Plant
Sosnovi Bor Pilot and Experimental Plant
Sosnovi Bor Branch of Radium Institute

Contaminants	Territories	Basins	Exit

Leningrad Region

Research and Technological Institute

Contaminant	Releases into atmosphere
Welding aerosol (iron oxide in terms of iron)	
Manganese and its compounds in terms of manganese dioxide)	
Compounds of trivalent chromium	
Nitrogen oxides (in terms of nitrogen dioxide)	
Nitric acid	
Ammonia	
Sulphuric acid in terms of H_2SO_4 molecule	
Sulphuric anhydride	
Carbon dioxide	
Fluorine gaseous compounds	
Fluorine compounds: slightly soluble inorganic fluorides	
Xylene	
Toluene	

Session III

Information Management Products

Chairman: E.R Seidel

The Application of the XUMA Expert System in the Free State of Saxony

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In the last years contaminated sites have become a relevant problem in the Federal Republic of Germany because there exist a large number of contaminated sites. About 10% of these sites have to be remediated. That's why in Germany more intensive efforts are undertaken in order to start necessary remediations. Basic initial conditions for an effective execution of these works are on the one side a systematically registration of these sites and on the other side the creation of an uniform possibility of evaluation in connection with the assessment of the environmental hazards.

Beside the 18.000 communal and the 27.000 private sites may be contaminated the responsible governmental offices of the state of Sachsen have additional problems during remediation of sites because radioactive components are in the sites of the former Soviet-German Corporation WISMUT which has been an uranium mining corporation.

In order to solve the problems regarding this background the responsible institutions of the state of Sachsen are going to build up a registration and evaluation system for sites may be contaminated.

Figure 1 shows the structure of this registration and evaluation system. The lines between the objects only represent the data flow. Online data connections don't exist. Therefore the direction of data transfer is defined in the following manner. The data acquisition takes place at the engineering offices. In order to ensure data consistency and data completeness the engineering offices use a interface program which can be generated automaticly from the knowledge base of the expert system XUMA. This interface program was developed by the Researche Institute Rossendorf (FZR - Forschungszentrum Rossendorf) together with the Technical University of Dresden (TUD). After what the data have to be transfered to the office which is responsible for the rural destrict (LRA - Landratsamt). Each LRA of a governmental district on the one side stores the data and of the other side transfers the data to the responsible governmental office (StUFA - Staatliches Umweltfachamt). Beside storing their own data all StUFAs transfer the data to the institute of environmental protection of the state of Sachsen (LfUG - Landesamt für Umwelt und Geologie). At LfUG the complete data of the state of Sachsen are stored. In order to handle these data different programs will be connected with this central data base. Some of the main functions these programs have to realize are shown in figure 2. The upper part of this figure describes the site-evaluation system that works in the following manner.

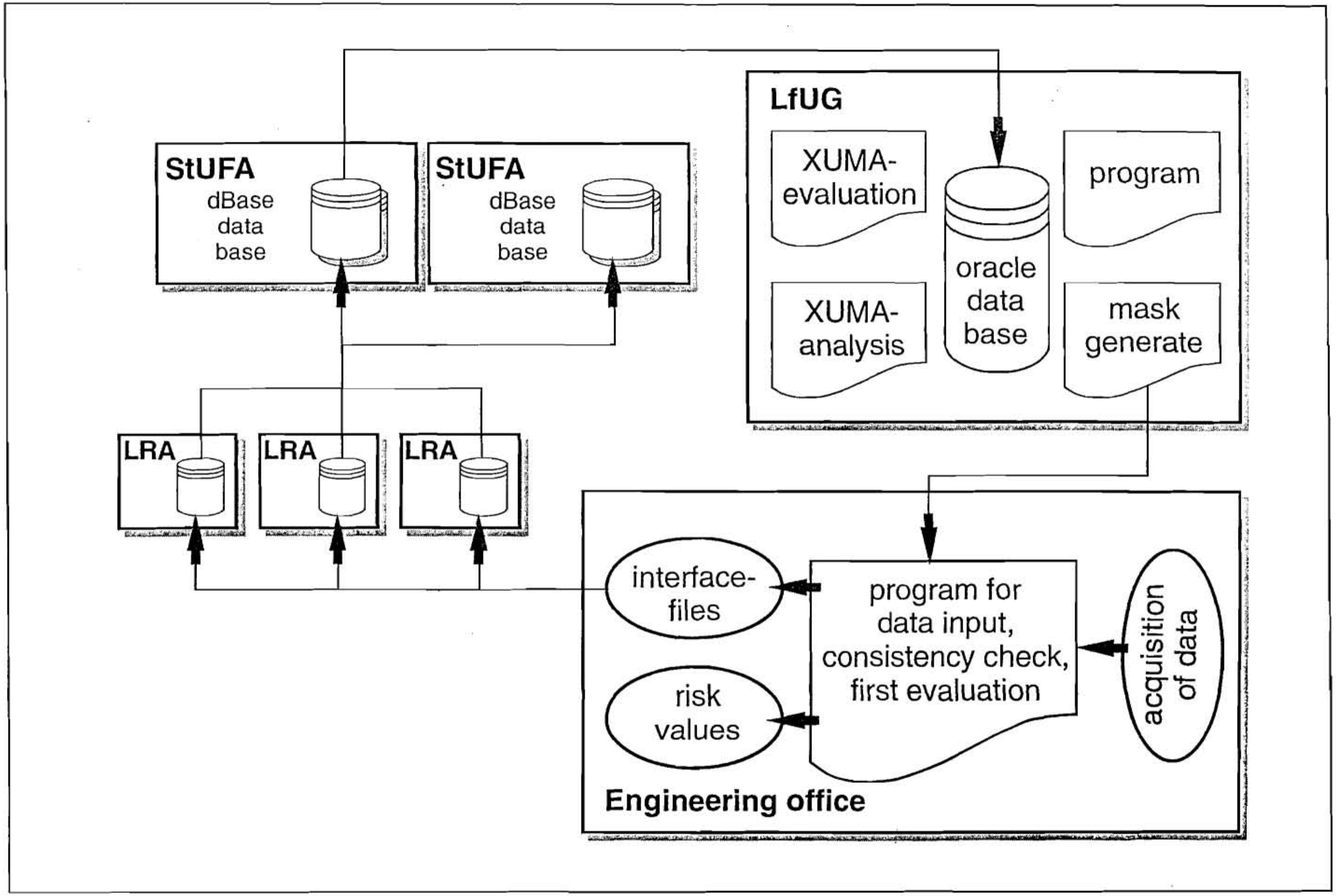

Fig. 1: Structure of the Registration and Evaluation System

The evaluation method used for contaminated sites in the state of Sachsen bases on the method which was developed at the Landesanstalt für Umweltschutz Baden-Württemberg (State Institute for Environmental Protection of Baden-Württemberg). The goal of this method is to determine priorities with respect to the environmental hazard and to the further investigations or a possible remediation of the site. In order to evaluate, the site has to be separated into four different media to be protected (groundwater, surface water, soil and air). For each of these media the following five steps are carried out. Each of these steps contains the calculation of hazard-increasing or -decreasing factors relative to a defined comparative site.

r0 - risk value of the site (hazard of substances)

m1 - transport of substances out of the site

m2 - transport of substances into the media to be protected

m3 - transport and effects of substances in the media to be protected

m4 - the significance of the media to be protected concerning the human

These five steps result into a numerical risk value describing the environmental hazard of the site. In dependence on the level of evidence this risk value allows to derive priorities with respect to further investigations and the environmental hazard of the site. The levels of evidence are defined through the kind of investigation. There exist four levels of evidence:

BN1 - historical investigation is finished (limited informations with assumptions concerning the substances and the geological situation but without any chemical and physical analyses)

BN2 - orientated investigation is finished (more detailed informations with a limited set of samples and chemical or/and physical analyses)

BN3 - detailed investigation is finished (detailed informations concerning the substances, the transport of substances etc.)

BN4 - investigation for remediation is finished

In dependence on the described evaluation level and the risk value the following activities are derived:

A - elimination (registration of site with no further investigations or inspections)

B - deposit with the demand for an inspection after a certain time

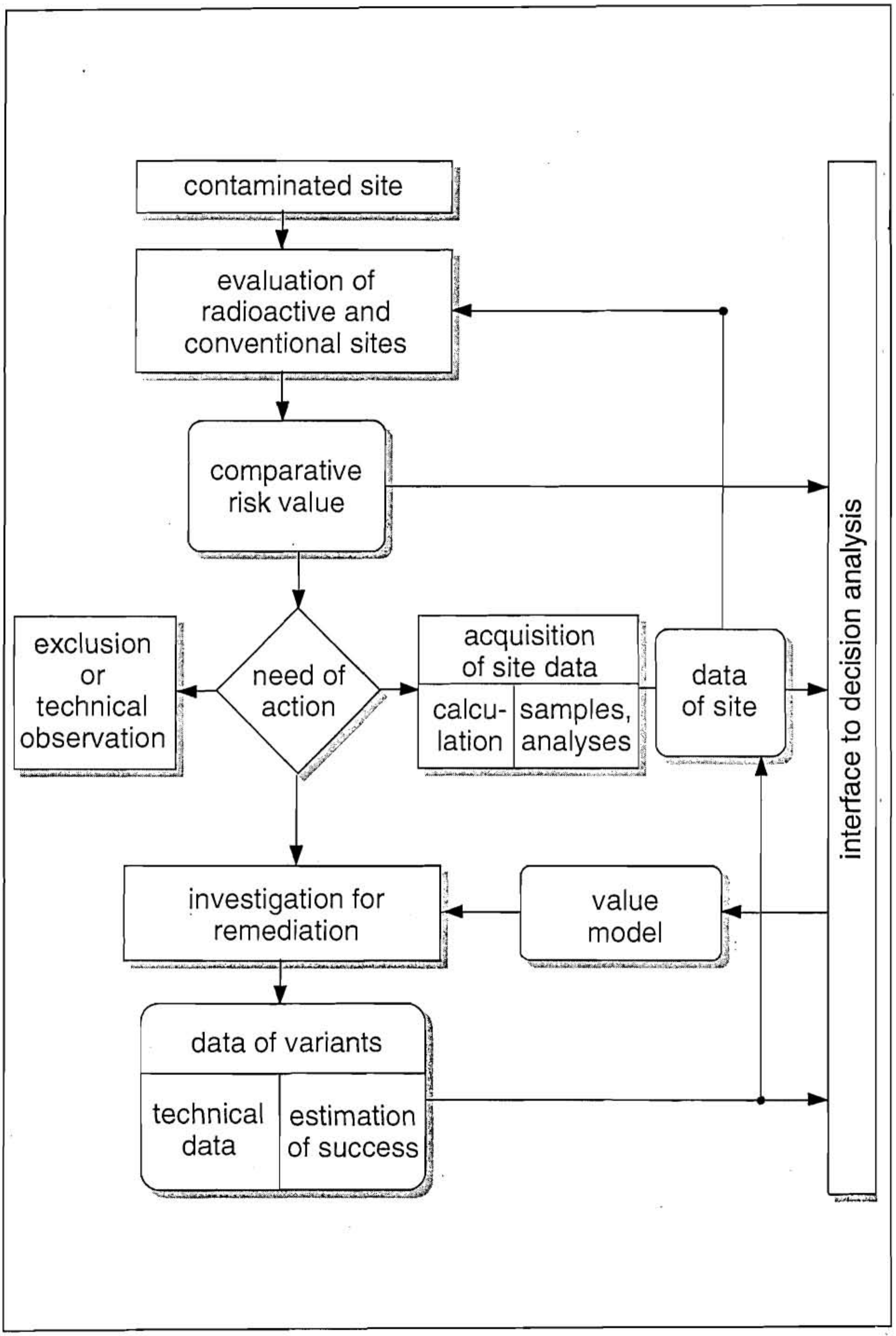

Fig. 2: Main Functions of Programs connected to the Central Data Base

C - deposit with the demand for continuous technical control measures

D - the demand for checking possibilities in order to reduce the hazard of the site (containment or/and remedial actions)

E - further investigations (not enough informations for decision)

Figure 3 shows the dependence of the activities on the evaluation level and the risk value.

The background for this step by step investigation method is that the costs for investigations increase rapidly from one level of evidence to the next one. With the help of this method many costs can be saved if actions A...C are derived at a lower level of evidence.

In order to support the evaluation and assessment of sites may be contaminated the FZR together with the Society for Nuclear Technique and Analysis Rossendorf (VKTA - Verein für Kernverfahrenstechnik und Analytik Rossendorf) apply the computer program system XUMA as one component of the central program pool showed in figure 1.

XUMA (German synonym for expert system on environmental hazards of contaminated sites) is a joint project of the Institut für Angewandte Informatik (Institute for Applied Information Science) of the Kernforschungszentrum Karlsruhe (Karlsruhe Nuclear Research Centre) and the Landesanstalt für Umweltschutz Baden-Württemberg (State Institute for Environmental Protection of Baden-Württemberg).

It is a knowledge based computer system, which shell support the staff of the responsible government offices at the uniform evaluation of the hazard potential, the preparation of analysis plan and the assessment of contaminated sites and mines. The system is to relieve the staff in their routine work, makes available the specialists knowledge for them and allows to take into account the most new findings with the help of a knowledge acquisition component.

Figure 4 shows the software and hardware environment which is necessary to run XUMA. The program XUMA is written in ART (a hybrid expert system development environment of the Interface Cooperation) and in LISP. It communicates with the relational data base ORACLE in which the site-specific data and the knowledge base (substances, branches, etc.) are stored. The user communicates with XUMA with the help of the graphical user-interface OPEN UI on DEC-Net-Protocol.

The functions of XUMA principally consists of the following five components.

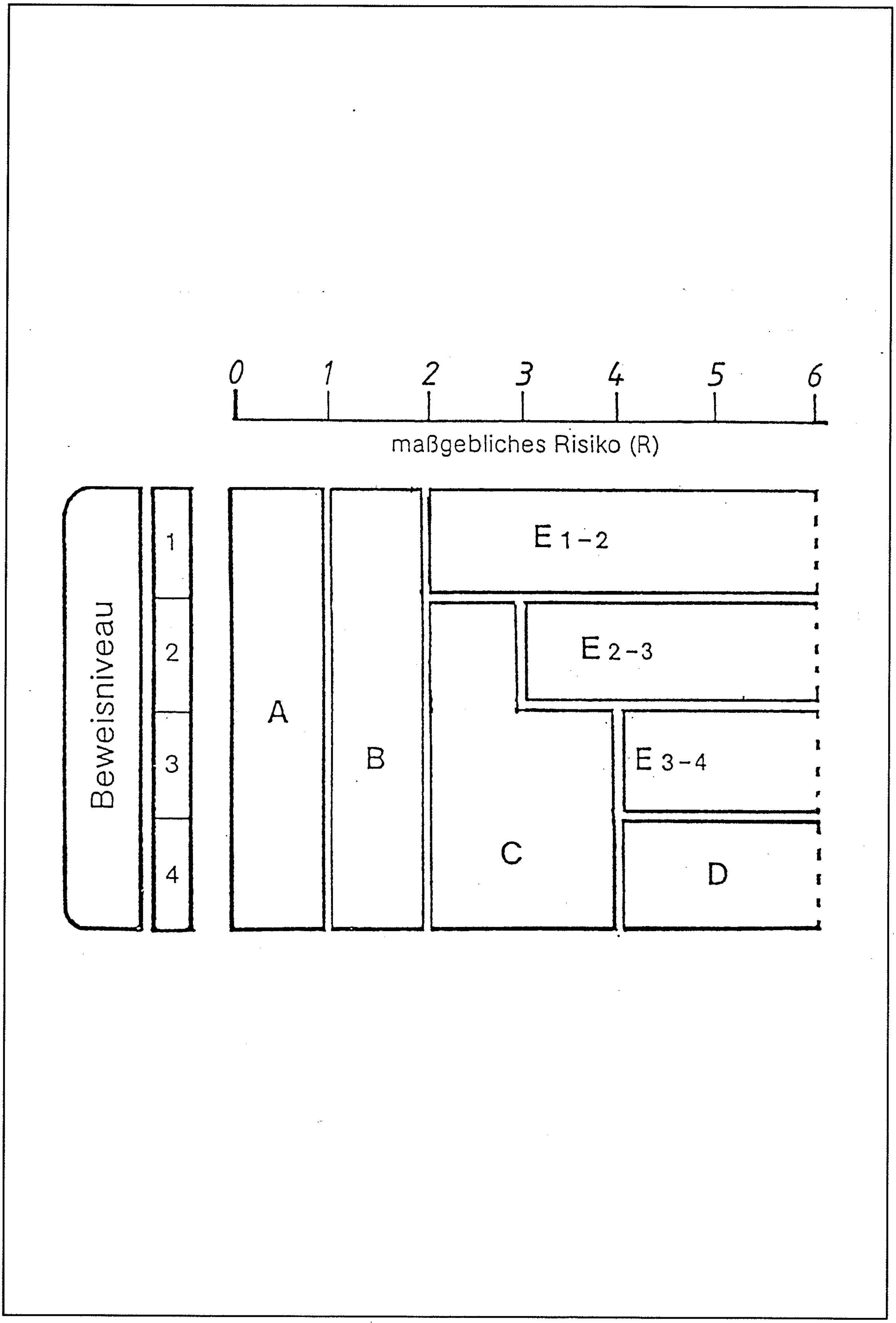

Fig. 3: Dependence of Activities on the Evaluation Level and the Risk Value

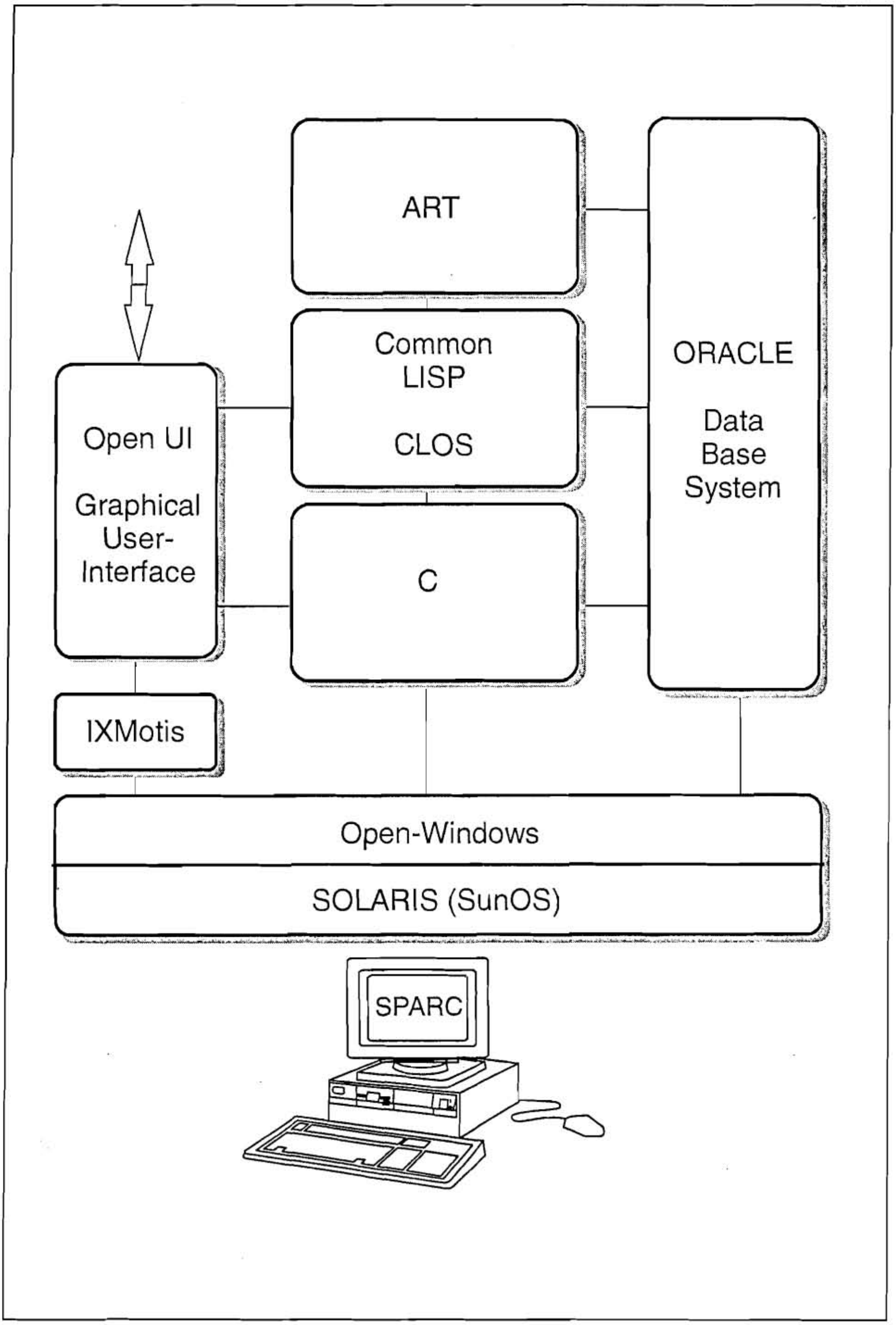

Fig. 4: Soft- and Hardware Environment of XUMA

1. Evaluation

The evaluation method used in XUMA correspond with the method described above.

Functions:

- systematical registration of waste suspected sites and their technical data

- objectivity during site evaluation with the help of a determined comparative risk value

- derivation of a need of action

- estimation of efficiency with respect to activities in order to decrease environmental hazard

Method:

- comparative evaluation of sites may be contaminated

- separate observation of the media to be protected (groundwater, surface water, soil, air)

- step by step evaluation of substantial hazard, transport and effects of pollutants and significance of the media to be protected

- evaluation process in the four levels of evidence

The next two components have a great significance in the higher levels of evidence. They evaluate the input data for the evaluation component at these levels.

2. Preparation of analysis plan and analyses acquisition

Functions:

- systematical registration of site-specific samples and analyses data

- derivation of an analysis plan for chemical and physical investigation of the specific site or a typical industrial branch

Method:

- supporting the selection of relevant analytical parameters by substantial or/and branch-specific hints

- three different possibilities of access for the derivation of an analysis plan

  - branch access (use of a branch tree which is implemented in the knowledge base)

  - substantial access (use of knowledge about site-specific waste)
  - standard access (waste with an unknown hazard potential)

- possibility of different detailed substantial investigation corresponding to the level of evidence

- possibility of different detailed analyses of samples corresponding to a eligible investigation level

3. Assessment

Functions:

- assessment of a specific site or a part of the site concerning to its samples, analysis quality and analyses results

Method:

- possibility to choose between three alternatives

  - assessment of an analysis
  - assessment of a complete sample
  - assessment of a whole site or a part of it

- kinds of assessment results:

  - quality of samples and/or analyses and their safety (comparison between analysis plan and analyses really carried out)
  - quality classes (classification of the measured values with the help of reference value tables)
  - statements about substances occurred in the site
  - derived assessment statements
  - statistics

In order to use this expert system effectively and to get an acceptance from the government office, the two following additional components are implemented. These are the explanation facility and the knowledge acquisition facility.

4. Explanation

The explanation facility enables the reconstruction and verification of the results. It shall help the user to check the plausibility of solution and to reconstruct the derivation path. Furthermore, it shall enable the expert to trace back the results to the basic knowledge and to prove the correctness of the solution.

Functions:

- explanation of derived assessment statements in natural language

Method:

- mouse-sensitive explanation of statements concerning the assessment in two justification levels

- the local justification describes:

  - the fact to be explained
  - the name of the rule, which has derived this fact
  - the rule content in natural language
  - the facts which have fulfilled the conditions of the rule

- the global justification describes:

  - the complete derivation tree of a statement
  - the possibility of rule-editing

5. knowledge acquisition

With the help of the direct knowledge acquisition facility the expert user is able to modify and complete the knowledge base. That means, the facility allows the manipulation of objects and rules without any experience in programming.

Functions:

- changing or completing the knowledge base with respect to the following components:

  - substantial data
  - analysis parameter
  - branches of industry
  - reference value tables
  - rules with regard to reference value tables
  - rules with regard to analysis parameters
  - evaluation features

Method:

- menu-controlled choice of the part of the knowledge base to be edited

- support of rule editing by a rule editor which represents the eligible rule components in a natural language manner

Beside the Sachsen-specific modification of the evaluation knowledge base the FZR and the VKTA are going to implement components, in order to get a suitable knowledge based system also for radioactive contaminated sites. The implementation of this "radioactive tree" requires the insertion of complex computer simulated calculation modules, because the distribution of radioactive substances in the environment, the radioactive decay and the transfer to human plays an exponent rule. This includes

- Distribution in the air, in the surface water and in the groundwater

- biotransfer chain earth - plant - animal - human
- the radioactive decay during distribution and biotransfer
- the different hazard of radioactive substances for the human

The relational data base ORACLE is to use as the connection between the expert system and the calculation modules.

With these implementations the knowledge based system has the in picture showed structure.

This program system should be an effective support for the government offices which are responsible for the evaluation and assessment of conventional and radioactive contaminated sites.

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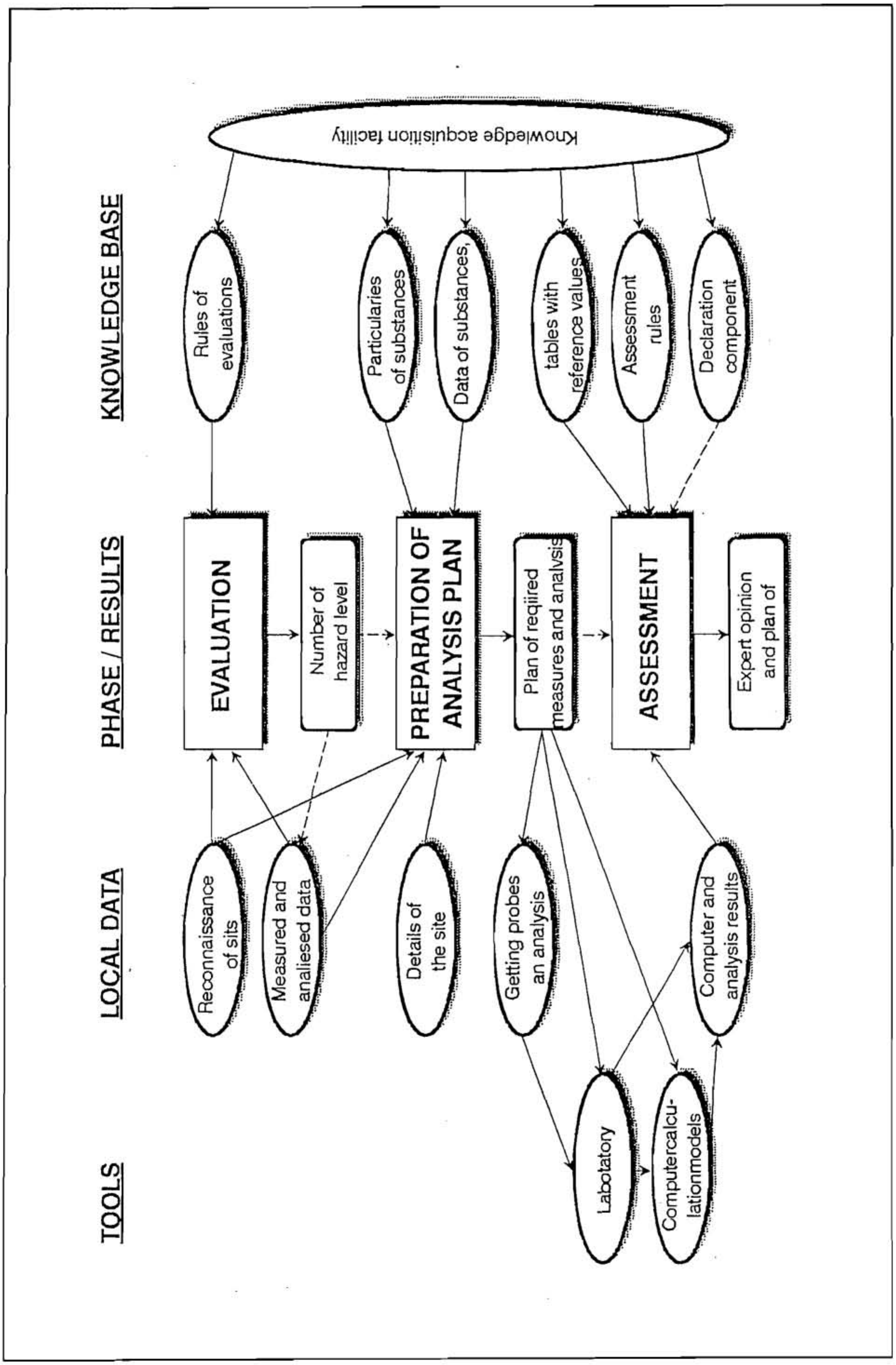


KNOWLEDGE BASE
PHASE / RESULTS
LOCAL DATA
TOOLS
Knowledge acquisition facility
Rules of evaluations
Particularies of substances
Data of substances,
tables with reference values
Assessment rules
Declaration component
EVALUATION
Number of hazard level
PREPARATION OF ANALYSIS PLAN
Plan of reqiired measures and analysis
ASSESSMENT
Expert opinion and plan of
Reconnaissance of sits
Measured and analiesed data
Details of the site
Getting probes an analysis
Computer and analysis results
Labotatory
Computercalcu-lationmodels

Information Systems of Chemical Substances and Organisms in North Rhine-Westphalia

G. Löwenthal
Landesamt für Immssionsschutz NRW, Essen

K. Bolst
ExpertTeam GmbH, Oberhausen

Bild 1 (Deckblatt)

During this presentation I want to present you the **data bank of organism and substance information** of the North Rhine-Westphalia State Agency for Air Pollution Control and Noise Abatement or called in German **Landesanstalt für Immissionsschutz des Landes NRW (LIS)**. This data bank is an essential part of the North Rhine-Westphalian **Information System of Substances and Installations (ISA)** which is subject to the **Federal Immission Control Act.**

Bild 2 (Data Collation and Transfer)

The first picture you see now shows the fundamental conception of ISA. Master of the data are the **North Rhine-Westfalia Factory Inspectorates (Staatliche Gewerbeaufsichtsämter).** Each Factory Inspectorate gets its data from the companies and concerns with installations in its district. After data gathering by the Factory Inspectorates all data will be collected by the **North Rhine-Westphalia State Agency for Air Pollution Controll and Noise Abatement (LIS)**. The evaluateted data will be sent to the **Minister for Environment, Regional Planning and Agriculture of North Rhine-Westfalia (MURL)**. These information will help the government during political decisions.

Bild 3 (Information System of Substances and Installations)

The next diagram shows a coarse data bank structure of the **Information System of Substances an Installations** called **ISA-DOS**. The bäses of **ISA** is the data file of installations. This data file contains all of the nearly 700 000 installations in North Rhine-Westphalia like smal backer's shops, big powerplants or chemical factories. An individuel installation number belongs to ever installation which is the basis of the whole data bank system.

Below the data file of installations different applications for different ordinaces have been developed like the application hazardous incidents ordinace or the application emission declaration ordinance and so on. Corresponding to each application substance informations are needed. These informations are included into the **Organism and Substance Information Data Bank** which is an integrated part of the whole system.

Bild 4 (Purpose for developing a data bank of organism and substance information)

Using these applications organism and substance information can be gotten by background functions.

The organism and substance information system has been created as a background program for identification of organisms or substances and the verificaton during data transfer into different applications of ISA. Substances will be indentified by names, synonyms or trade names and will be taken over into the correspondig data field of the whole applications of ISA.

Bild 5 (evolution of a separate program organism and substance information)

The main reason for developing a seperate applicaton **Data Bank of Organism and Substance Information** was that the background program could not used without ISA. Many German authorities in North Rhine-Westfalia and other countries are intrested to use the organism and substance information included in ISA. By this way a special independent program about organism and substance information has been develloped for authorities and private companies. This program is equipped with facilities to identify organisms and substances in different ways. After identifieing a substance or an organism the program produces a quick overview about substance characteristics and corresponding regulations. The data bank can be orderd free of charge by all authorities and for a fee of 450,-- DM by companies and private persons.

Bild 6 (data bank of organism and substance information)

The next picture shows the modular structure of the data bank of organism and substance information. This program has been build with three seperat modules which can work alone or in each combination. Every module contains for each ordinace or official list a seperate data file. Every program module can bee enlarged with new substance lists without changing the source code of the program and without recompilation.

The module **basic data bank** contains lists about the different topics of law **hazard incident**, **water**, **dangerous substances** and **air polution control**. The second module **residues** contains information about the **catalogue of waste categories**, about **assignments of residues to installations of the 4. BImSchV** (the so called LAI-list) and about **exploiter of residues**. Specially the module **organisms** contains information which are needed fulfiling the German genetic act.

Bild 7 (structure of the basic data bank)

On the next illustration you see the structure of the module basic data bank. The module itselfe has been built by several modules, too. The first data file called B0 contains the ident informations about substances. Substances will be searched within this ident data file B0. If a substance has been identified within B0 the program proves in which data files corresponding to the searched substance information are contained. Only data files which contain information about the searched substance can bee coosen.

Bild 8+9+10 (contents of the three modules)

The following three tables show a short description of the lists which are contained into the basic data bank, into the waste list and into the organism list.

Bild 11 (statistics about the data bank of organism and substance information)

The relevant version 3.1 of the data bank of organism and substance information contains in its basic module more than 8000 different chemical substances with more than 36000 synonyms or trade names and nearly 6000 chemical formulas.

More than 5500 organims and 1500 vectors have been stored into the module organisms. And last not least the data bank of residues contains 720 waste categories, 1100 assingnments of waste to installations of the 4. BImSchV and nearly 1500 adresses of exploiters of waste.

Bild 12 (source of supply)

The last illustriation today will show your source of supply. Since the beginning of 1993 the data bank of organism and substance information can only be ordered by the North Rhine-Westphalia State Agency for Air Pollution Control and Noise Abatement called Landesanstallt für Immissionsschutz des Landes NRW. All authorities can get it free of charge. Companies and private persons have to pay a short fee of 450,--DM.

At the end of this presentation I want to inform you that you can observe a demonstration of the data bank of organism and substance information on a PC on the floor.

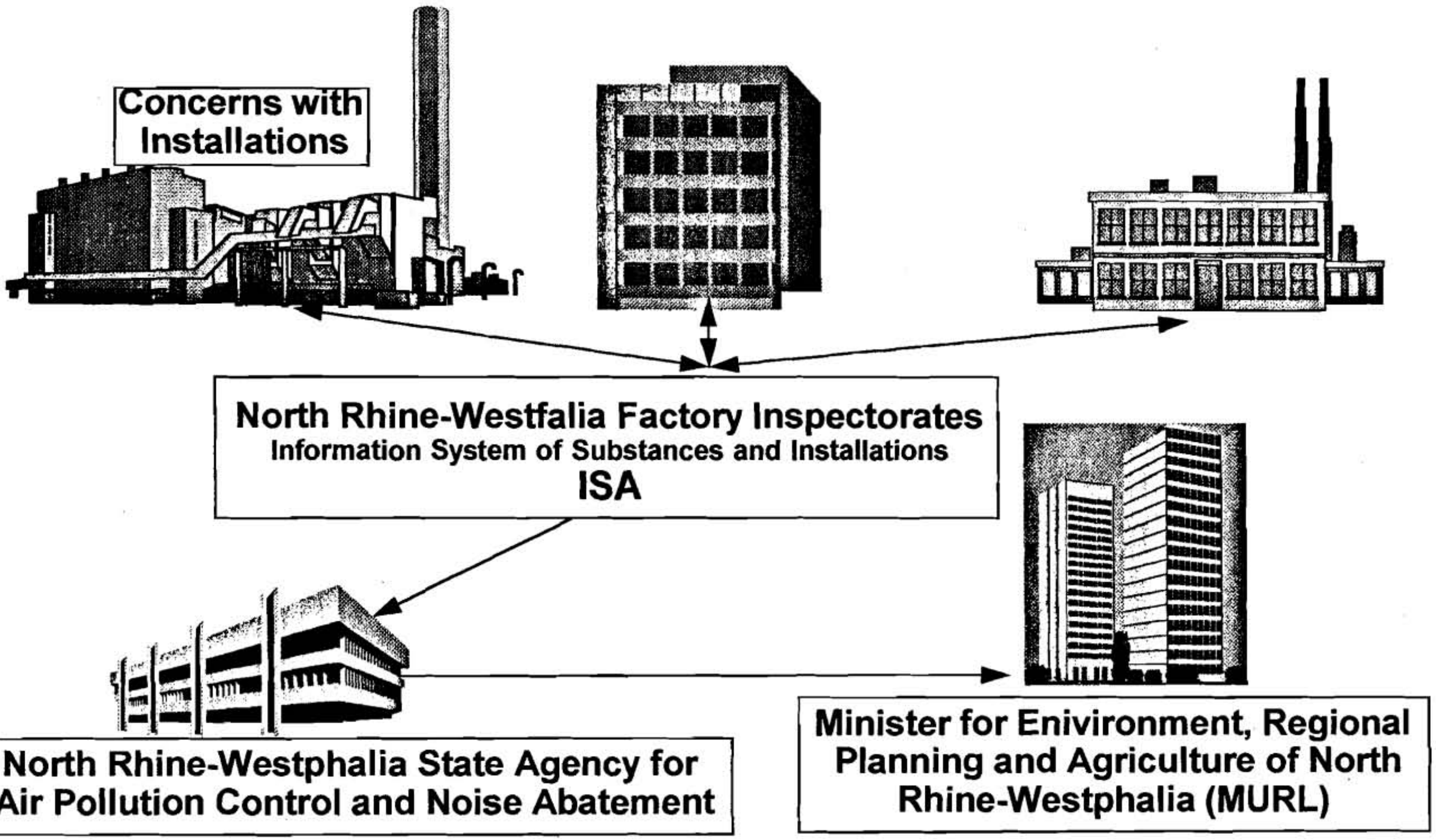
Thank you for your attantion.

North Rhine-Westphalia State Agency for Air Pollution Control and Noise Abatement

Landesanstalt für Immissionsschutz NRW

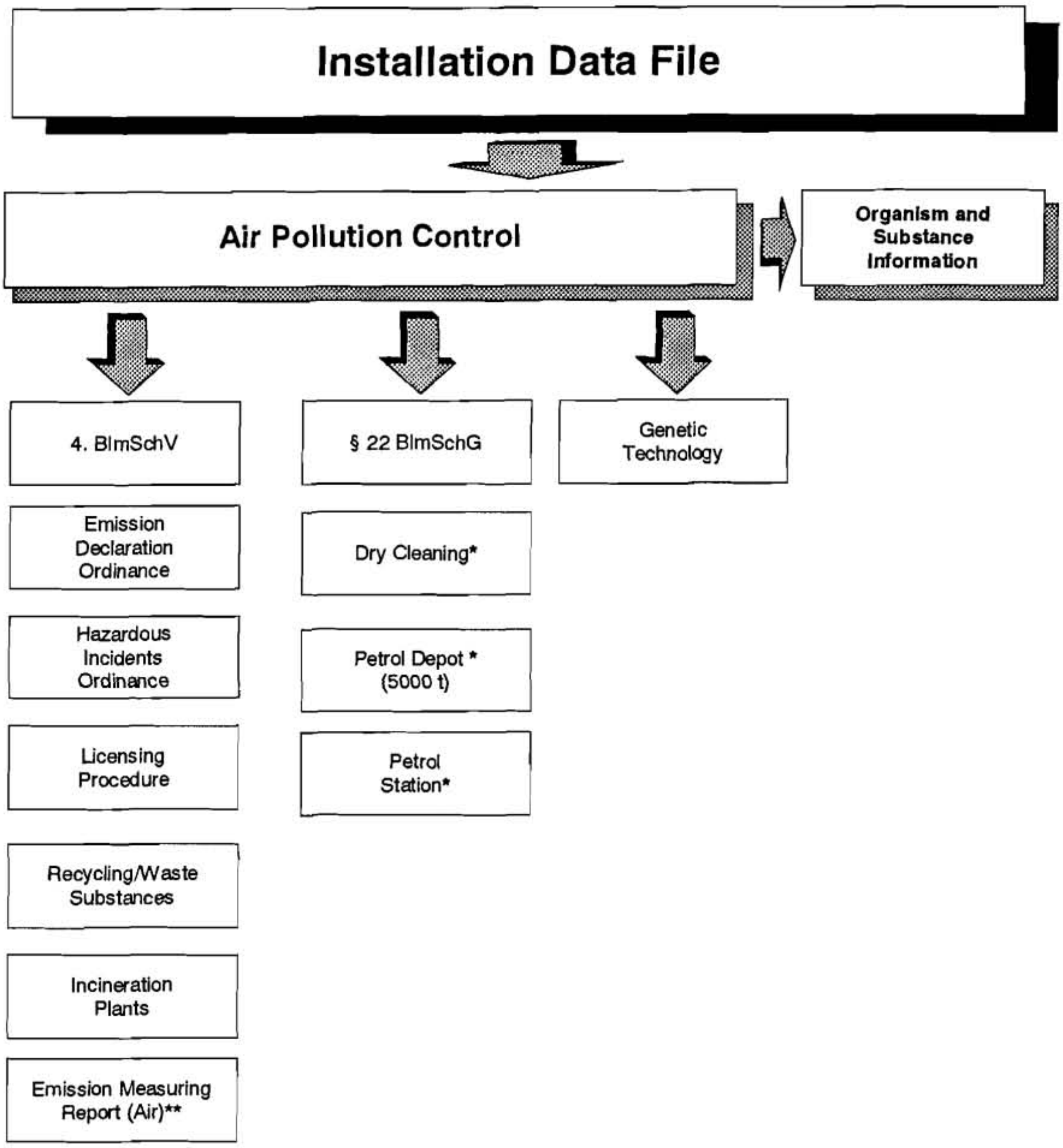
Information System Substances and Installations
Informationssystem Stoffe und Anlagen
ISA

Data Collation and Transfer



Information System - Substances and Installations
ISA-DOS Version 5.2

September 1993



* in preparation
** in planning

Purpose for Developing a Data Bank of Organism and Substance Information

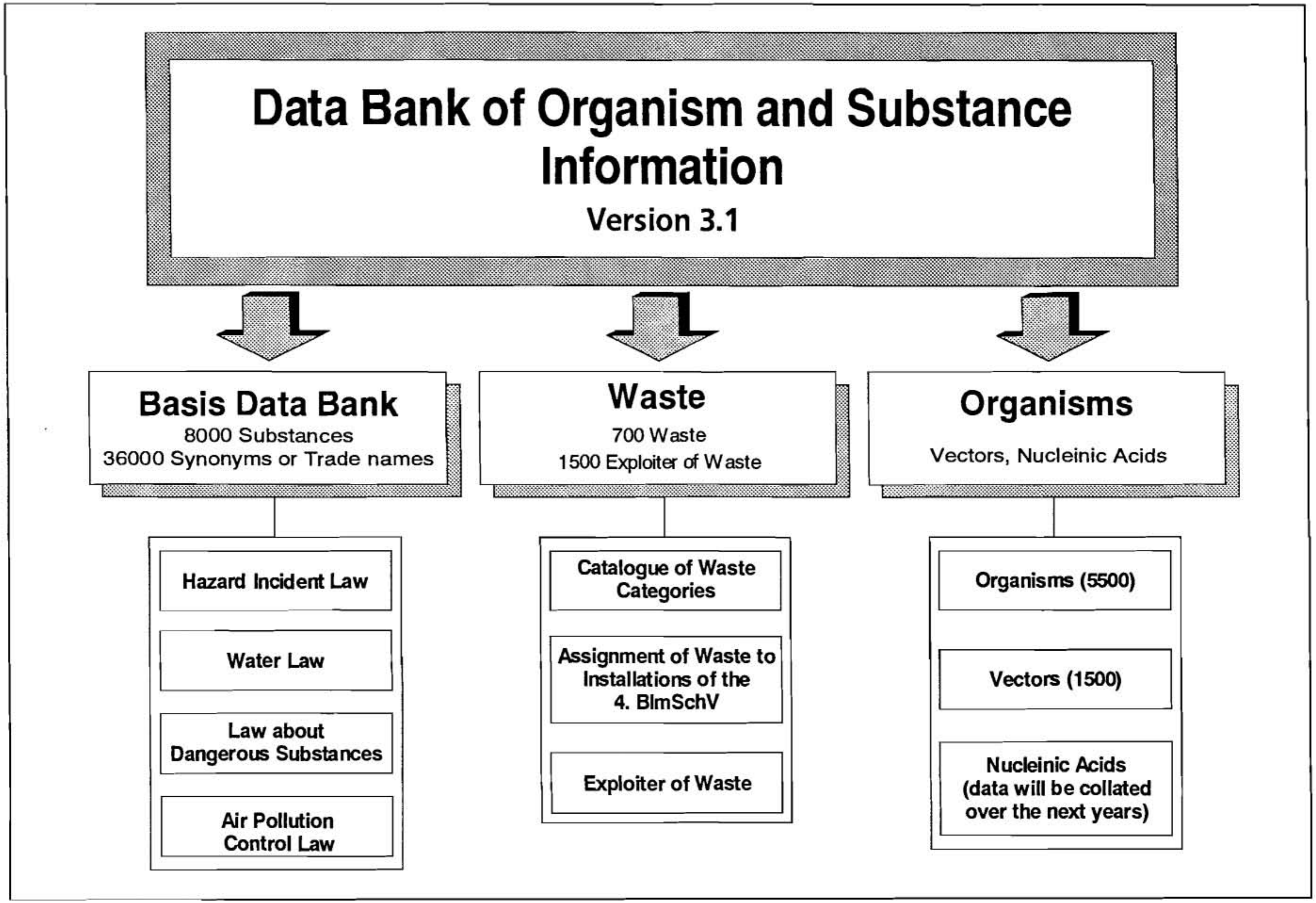
- the Organism and Substance Information System has been created as a background program for the identification of organisms or substances and their verification during data transfer into different applications of ISA

- this program is equipped with facilities to identify materials with different search methods, such as searching for names, trade names, chemical formulas, CAS-numbers and other characteristic numbers

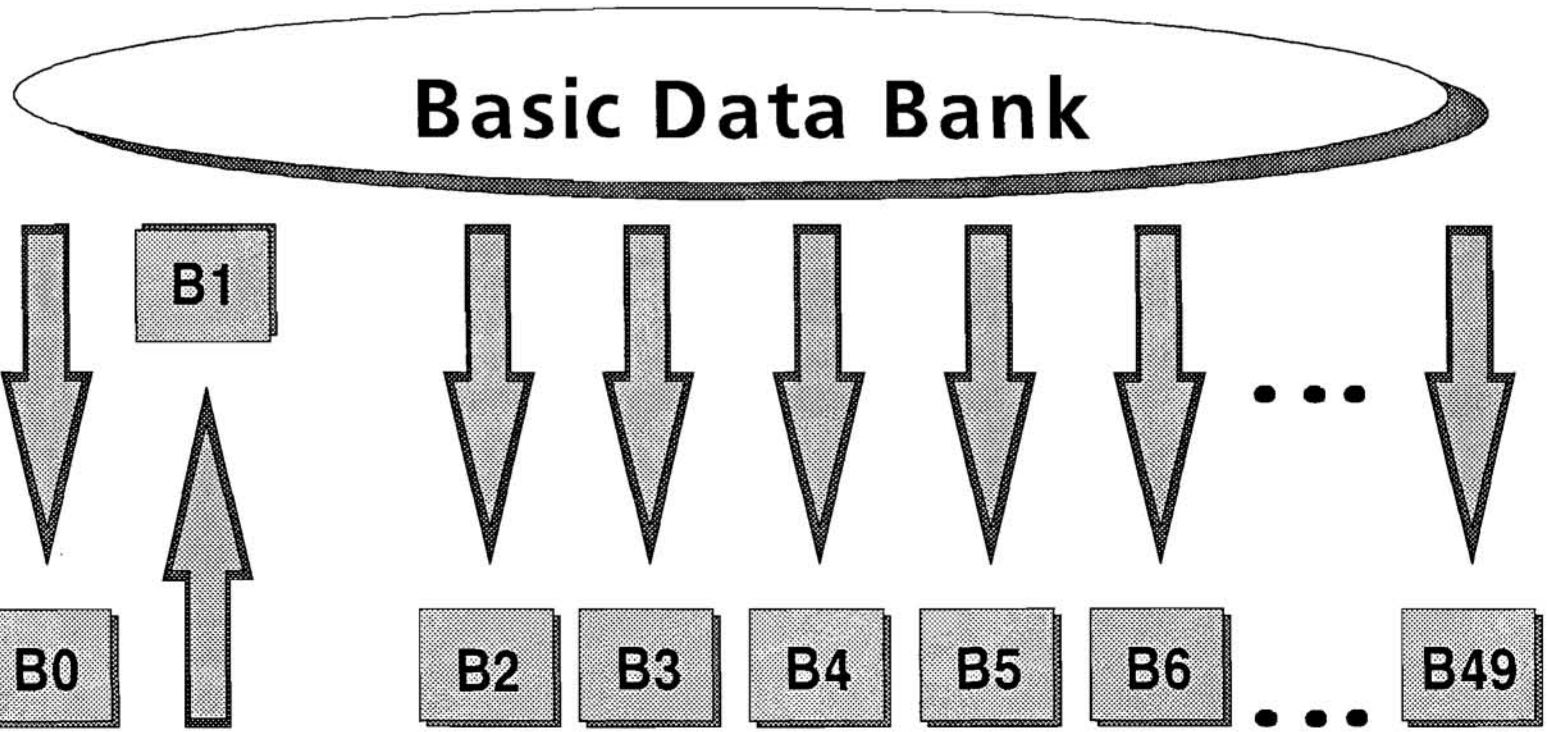
- automatic transfer of substance (or organism) information from official lists into the current data fields of the corresponding application of ISA is implemented

Evolution of a Seperate Program »Organism And Substance Information« for Governmental Administrators and Private Companies

- support during identification of organisms and substances
- quick information about the characteristics and corresponding regulation of substances and organisms
- user composed data sheets on substances
- the organism and substance information data bank can be ordered free of charge by all authorities
- companies and private individuals can order it for a fee of 450,- DM plus 15% VAT.


Data Bank of Organism and Substance Information
Version 3.1
Basis Data Bank
8000 Substances
36000 Synonyms or Trade names
Waste
700 Waste
1500 Exploiter of Waste
Organisms
Vectors, Nucleinic Acids
Hazard Incident Law
Water Law
Law about Dangerous Substances
Air Pollution Control Law
Catalogue of Waste Categories
Assignment of Waste to Installations of the 4. BImSchV
Exploiter of Waste
Organisms (5500)
Vectors (1500)
Nucleinic Acids (data will be collated over the next years)

Structure of the Basic Data Bank



substances will be searched within the ident data file B0

the data files B2 to B49 will be called from the identification data file B0

Contents Of Basic Data Bank (Files B2 To B29):

Description Of The Lists	File Name
12. BImSchV (Hazard Incident Ordinance 91 Appendix II, III and IV)	B2
Council Directive on the major-accident harzards of certain industrial activities (82/501/EEC)	B3
EPA (Environmental Protection Agency) -List (40 CFR Parts 300 & 355)	B4
Prelimenary IDLH (Immediately Dangerous to Life or Health) Values from the VCI (Verband der chemischen Industrie)	B5
EINECS-, RTECS-, OHMTADS-Numbers.	B6
NIOSH (National Institute for Occupational Safety and Health) - IDLH (Immediately Dangerous to Life or Health) - Values 87	B7
NIOSH (National Institute for Occupational Safety and Health) List of Working Enviroment Threshold Limit Values	B8
List of Water Polluting Substances by KBwS	B9
List of Water Polluting Substances by VCI (Verband der chemischen Industrie)	B10
Ordinace of Dangerous Substances Appendix VI	B11
Ordinace of Dangerous Substances Appendix II (List of Cancerogen Substances)	B12
LD (Lethal Dose) - Values Appendix I of the Ordinace of Dangerous Substances	B13
TRGS 900 // German TLV-Values (MAK-Werte)	B14
TRGS 900 (BAT-Value List // Biological Work-Place Acceptable Limits)	B15
MIK (Maximale Immissionskonzentrationen) by VDI 2310	B16
TA (Technische Anleitung) - Luft (Immisson Values)	B17
TA (Technische Anleitung) - Luft (Emission Values)	B18
VDI 2280 (Ejection Restriction of Organic Solvents)	B19
ACGIH (American Conference of Governmental Hygiensts) - List of Limiting Values for Places of Work	B20
OSHA (Occupational Safety and Health Association) - List of Limiting Values for Places of Work	B21
IARC (International Agency for the Research on Cancer) - List of Cancerogenities	B22
NTP (National Toxicology Program) - List of Cancerogenities	B23
BUA (Beratergremium umweltrelevanter Altstoffe) - List of Substance Reports	B24
BG (Berufsgenossenschaft) - Chemie List of Substance Reports	B25
ECETOC (European Chemical Industries Ecology and Toxicology Center) -List of Substance Reports	B26
ARW (Arbeitplatz Richtwerte) Work-Place Guidelines // List from the VCI	B27
EG-Guideline of Prohibited Substances (EG-RL76/769/EWG)	B28
Auertechnikum (only for North Rhine-Westfalia Factory Inspectorates)	B29

Contents Of Basic Data Bank (Files B31 To B49):

Description Of The Lists	Datei
Osour Limits from the Appendix of the Enforcement Decree to TAL	B31
TRGS 500 (Classification of Cancerogen Substances)	B32
BG-Grundsätze krebserzeugender Gefahrstoffe (Principles corresponding to Cancerogen Dangerous Substances)	B33
Biomonitoring EKA-Values (BG Chemie)	B34
Appendix 2, 3, 4 to TRB 610 (Aufstellung von Druckbehältern zum Lagern von Gasen)	B35
Reference to other Quotations	B36
LIS-E-Kataster Numbers	B37
VFDB-Guidlinie 10/01	B38
PDK-Values of GOST	B39
Limiting Values of SUVA	B40
Exposure Standards (Australia)	B41
PEL-Werte (Ungarn)	B42
Hazard Incident Ordinance (Austria)	B43
Water Polluting Substances (Austria)	B44
Hazard Incident Ordinance (Switzerland)	B45
Water Polluting Substances (Switzerland)	B46
VwV P172-1 of the Arbeitsinspectie (Netherlands)	B49

Contents Of The Organism List and the List of Residues:

Description Of The Lists
List of Organisms Correspondig to Genetic Engineering
List of Vectors Correspondig to Genetic Engineering
Listof Nucleinc Acids Correspondig to Genetic Engineering (data will be collated over the next years)
Catalogue of Waste Categories by LAGA (Länder Arbeitsgemeinschaft Abfall)
Assignment of Waste to Installations of the 4.BImSchV (LAI-Catalog)
Liste of Waste Exploiter (UBA Verwerterhandbuch)

Statistics about the Data Bank of Organism and Substance Information

basis data bank:

substances	8000
synonyms/trade names	36000
chemical formula	6000

data bank of organisms:

organisms	5500
vectors	1500

data bank of waste:

waste/waste categories	720
assignment of waste to installations of the 4. BImSchV	1100
exploiter of waste	1500

Data Bank of Organism and Substance Information
Landesanstalt für Immissionsschutz des Landes NRW
Wallneyer Straße 6, 45133 Essen
phone: (0201) 72 00 6 - 50/51
fax:(0201) 72 00 6 - 57

- **all authorities**
  free of charge

- **companies and private persons**

single licence:	450,- DM plus 15% VAT
supplementary licence:	150,- DM plus 15% VAT
update:	130,- DM plus 15% VAT

- **disc formates available**
  1,2 MByte 5,25"
  1,44 MByte 3,5"

Information System Substances and Installations

Reasons for use within commercial applications

- Defacto-standard in German speaking countries
- All important laws and decrees are implemented
- Extensive, concerning number of substances
- Recycling/Waste substances and genetics are included (nothing comparable exists!)
- Open system with good interfaces
- Capability of defining subsystems for other use
- Ease of integration into other systems
- Fast updates
- Good maintenance, services and hotline
- Adequate price-performance-relation
- Further development is guaranteed for the coming years

Dr.-Ing. Klaus Bolst, ExperTeam, Oberhausen
Centre For Environmental Computer Science And Consultancy

Altlastenkataster - Register of Contaminated Sites

H. Biesold, H. Gewehr, G. Haider, H. Uhlenbruck
Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) mbH, Köln

1. Introduction

Since the early Middle Ages, the mining of silver, bismuth, cobalt, nickel, copper and hard coal had been prevalent in the federal German states of Saxony, Thuringia and Saxony-Anhalt. These natural resources were often found in paragenesis with uranium minerals which at the time were considered worthless and were put on slag heaps together with other overburden in the vicinity of the mines. As in those days the radiological hazards going out from this overburden were unknown it was frequently used as building material or building land.

The **legacy of past mining activities** was worsened even more when after the second World War the Soviet Joint-Stock Company (Sowjetische Aktiengesellschaft, SAG) began rigorous uranium ore mining, using initially the existing mines. Mining activities were then extended by the exploitation of new uranium ore deposits. This led to new ecological damage in densly-populated and economic areas. In the middle of the 1950s the SAG was converted into the Sowjetisch-Deutsche Aktiengesellschaft (Soviet-German Joint-Stock Company, SDAG) »WISMUT«.

The legacies of uranium and other past mining activities can lead to an exposure to radiation. The unknown radiological situation is worrying the public and may harm the economic development in the regions concerned. It is **an urgent environmental, political and economic matter of concern - not least for reasons of preventive health care -** to the Federal Minister for the Environment, Nature Conservation and Nuclear Safety (BMU) to register these mining legacies and to investigate and evaluate their potential radiological hazard, and thus to create the conditions for redevelopment measures. The registration of the environmental radioactivity caused by past mining activities was laid down in the German Reunification Contract as a special responsibility of the federal state, with the Federal Office for Radiological Protection (BfS) as the official body to tackle the tasks involved. The Radiological Protection Precaution Act which regulates such exceptional radiological situations was accordingly amended. Only a detailed survey of the radiological relevance of the legacies will make it possible to

- assess the overall situation,
- explain the need for security and redevelopment measures and to
- support the further economic development of the affected regions by singling out the areas and objects that are in fact contaminated.

For that reason, the BfS has started the Project titled »**Radiological Registration, Investigation and Assessment of Contaminated Sites from Past Mining Activities (Register of Contaminated Sites)**«.

A distinction must be made between those legacies which can still be legally attributed to the WISMUT and the ones where the parties responsible do no longer exist or are no longer legally bound. For the legacies of the first kind, the WISMUT bears the responsibility. However, the company stopped its regular mining activities on 1 January 1991 and is now preparing its facilities for decommissioning. The WISMUT has been ordered by the Federal Minister for the Economy to carry out a comparable registration of data for these areas, operational plants and installations in order to collect them in the so-called **environmental register**. This will be harmonised with the **register of contaminated sites** to enable a direct transfer and comparison of data and results and thus to create a uniform basis for evaluations.

2. Aim of the Project

It was the aim of the first project phase to use the **existing information** from documents of commercial firms and institutions of the former GDR in order to identify areas and objects as contaminated sites and to assess them radiologically. Therefore it was necessary to store the available data and information as quickly as possible in a **data bank** and to evaluate them.

The **Gesellschaft für Anlagen- und Reaktorsicherheit (GRS)** was commissioned to carry out the project as main contractor. Its task was furthermore to involve those institutions and companies from the affected regions in the project who could provide the factual knowledge on mining as well as the relevant data.

3. Data Bank

In its present form, the data bank »Register of Contaminated Sites« developed by GRS consists of several **master files and subject files**

Master file A contains the geographical coordinates of the corner points of all determined suspected areas and has information on the singled-out geological partial area withing these coordinates.

Master file B contains information on the individual objects within the suspected areas like slag heaps, shafts, trial pits, removing plants, ore loading points and mining areas; it also includes other relevant data such as geographical position, area and volume, and former suppliers, users and operators. There are presently approx. 8000 objects registered in master file B, also counting those objects which have been registered outside the defined suspected areas. All objects are directly or indirectly related to uranium ore or other past mining activities.

The subject file **radioactivity** accomodates all the measurement results on radioactivity in the environment media. These are subdivided into the following categories: local dose rate, radioactivity in the air, radioactivity in the soil, radioactivity in the water, and radioactivity in biomedia such as plants and animals. A further differentiation is possible if needed. The subject file radioactivity contains at present the results of the aero-gamma measurements (eU and eTH content in the soil) for practically all suspected sites and, on a larger scale, for almost the whole of Saxony, Thuringia and partly for Saxony-Anhalt. These can serve to determine large-scale areas with increased U-concentrations in the soil. In addition, there are at present more than 30.000 data sets stored on local dose rates and on radioactivity in the air, soil, water and in other environment media. The majority of the measurement results comes from the pilot projects and the measurement tasks performed by the BfS, the smaller part from the monitoring of the environment through the State Office for Nuclear Safety and Radiological Protection (Staatliches Amt für Atomsicherheit und Strahlenschutz, SAAS) of the former GDR or through the WISMUT.

The subject file **earth science** contains data that is needed for the registration of natural radioactivity as well as concerning the spreading of radioactivity in the environment. It is divided into the subordinate files geology, hydrogeology, soil geology and earth chemistry and contains in all some 10.000 data sets.

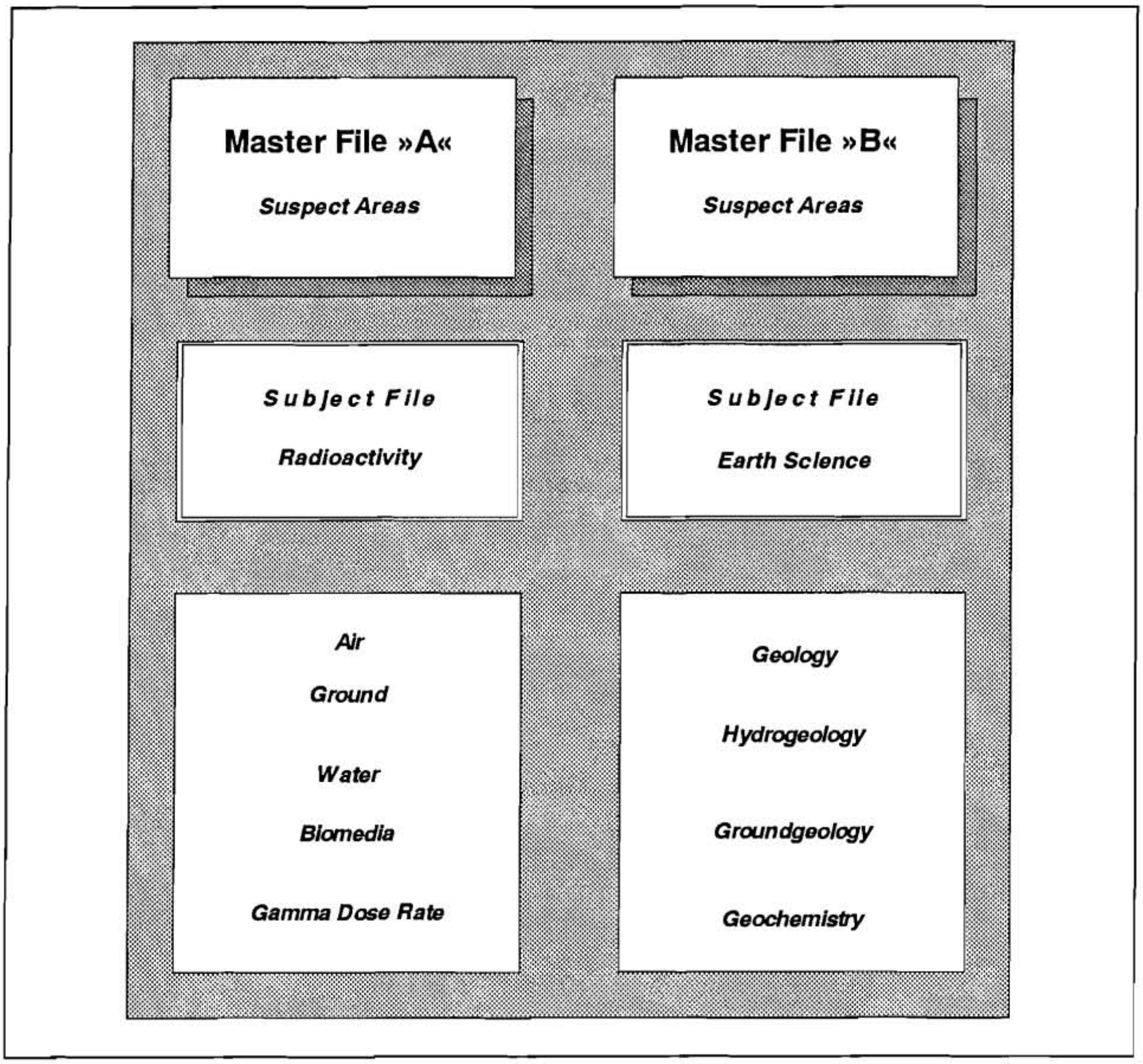


Fig. 1: Structure of the Databank »Altlastenkataster«

Environmental Information Systems

R. Winkelmann
Digital Equipment GmbH, Köln

Two Environmental Information Systems are described :

- **IMIS / IRIS** (Integrated **R**adioactivity **I**nformation **S**ystem)
  IRIS is the international version of IMIS (horizontal expansion into the area).
- **INFOTHEK** (Enterprise Environmental Information System)
  INFOTHEK is the vertical expansion of IMIS - say - Surveillance of other environmental pollution and more.

The base-system for surveillance of radioactivity is **IMIS** (Integrated Measurement Information System), which is installed and in operation in whole Germany. Those of you who attended the annual meeting of the GRS in 1992 may remember the presentation of IMIS held by the Federal Agency for radiation protection (BfS).

1. IMIS/IRIS (Integrated Radioactivity Information System)

In course of the nuclear power plant accident at Tschernobyl the German Government passed a law for the preventive protection of the population against the Exposure to Radiation. In order to comply with the law, the BMU (Federal Ministry of Environment) signed a contract in 1988 with DIGITAL as prime contractor to develop and deliver the IMIS. In 1990 this contract was expanded to cover whole Germany after the reunification.

This act has been assigned for the pupose :

- to survey the environmental radioactivity, and
- to keep both radiation of man and radioactive contamination of the environment as low as possible by implementing appropriate measures in the event of an incident of potential radiological output.

For the purpose of monitoring the environmental radioactivity, the act laid the basis for **IMIS**, which is in operation since October 1990. The concept provides functions for the following tasks of the » **I**ntegrated **M**easurement and **I**nformation **S**ystem«:

- continous surveillance of the environmental radioactivity
- early detection and assessment of events that are potentially significant radiological input (early warning).
- continuous and comprehensive information about the actual radiological situation and

assessment of the actual consequences,

- accumulation of knowledge about the radiological situation and related consequences.

In view of these tasks, the overall system was designed to meet the following requirements :

- permanent measurement of radioactivity in the relevant environmental fields
- fast processing of measured data and communication to the appropriate authorities for further analysis
- forecast of the potential future development of the radiological situation
- accumulation of currently known data and information as a basis for fast evaluation and decision making.

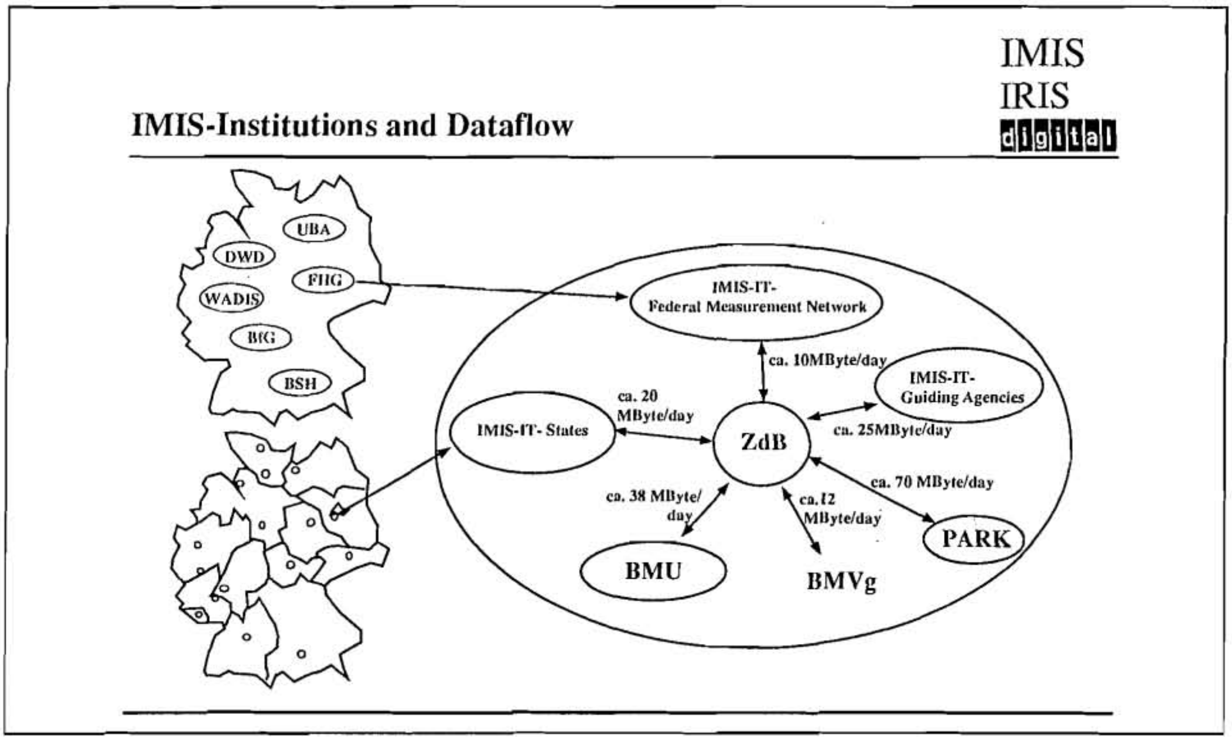


Fig. 1: IMIS-Institutions and Dataflow

The surveillance of specific activity in other environmental fields (food & beverage, tobacco...) is performed by 47 state measuring agencies linked together into 16 state measurement networks. Together with data from 5 Federal Measurement Networks with about 2000 sampling points all data are forwarded electronically for checking and processing to so-called Guiding Agencies for the surveillance of the Environmental Radioactivity. Then the data are electronically returned to the central federal Agency for the Surveillance of the Environmental radioactivity to summarize, process and document data for the Federal Minister for the Environment, Nature Conservation and Nuclear Safety. The Minister makes the first evaluation of the radioactivity-data and gives corresponding recommendations. The Minister submits a report on the status of environmental radioactivity to the federal parliament and the Federal Council. He informs media and the publics.

The following environmental fields are controlled by state Measurement Agencies :

- Food & Beverage
- Drinking Water, Groundwater
- Animal Feed
- Soil
- Plants
- Organic Fertilizer
- Surface Water
- Residual and Waste Materials
- Tobacco
- Medical Drugs and their Basic Substances
- Commodities

2. System Integration

One critical success factor for such a system is the capacity on doing system integration on several levels :

- by merging compatible technologies with standardized data exchange
- by cross-linking different systems and system-components based on a comprehensive communication/managing infrastructure
- by combining different presentation forms (text,table,maps,business graphics), based on homogenous basic data
- by summarizing or linking relations, using central and locally distributed databases (data integration)
- by inclusion of expert knowledge and decision-relevant information via appropriate systems (PARK)

These tasks can not be handled by a PC.

The central hardware components are **RISC**-computersystems with connected Workstations like the DECstation 5000/240. Printer for output and cassette or tape for backup of the data. Database Disk and System-Disk and transmission path with packet Switching X.25.

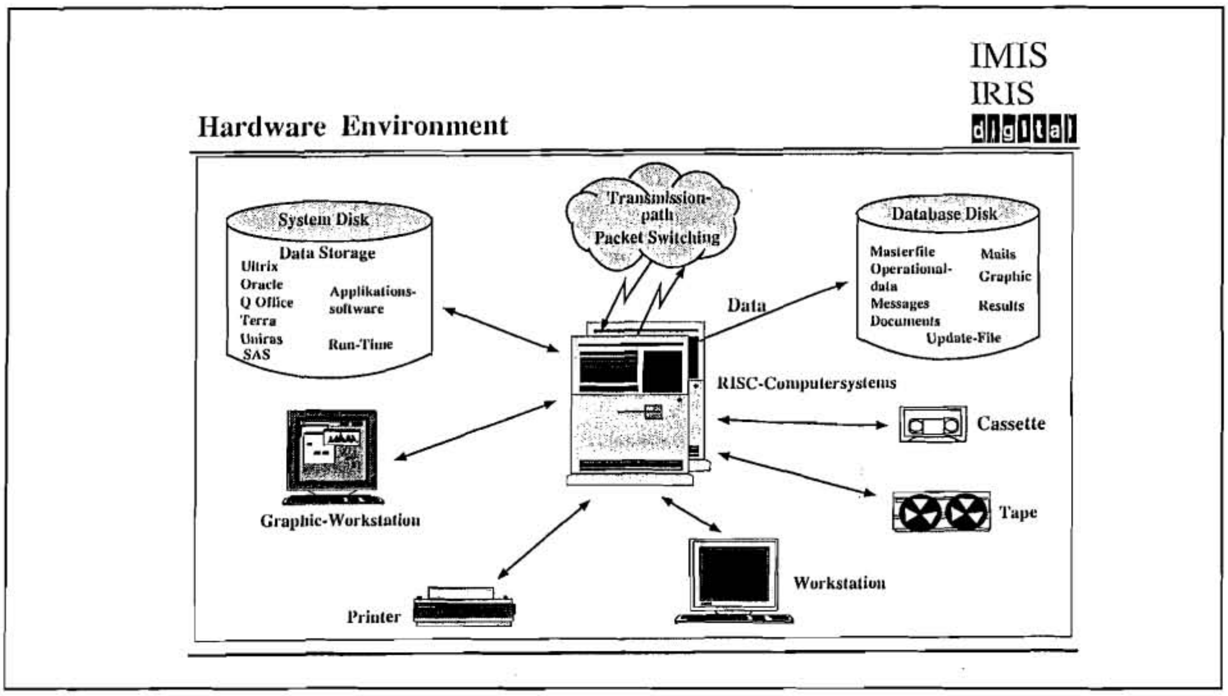


Fig. 2: Hardware Environment

Expansion of IMIS/IRIS into other countries

The system was built by **DIGITAL** as the prime contractor together with **Dornier** and some other companies. The system is in operation since October 1990. Even before that time it was recognized that IMIS has taken a leading role in the area of radioactivity surveillance. The demand for this system in other countries is pressing. Based on this and the experience in building such large systems the partners **DIGITAL** and **DORNIER** made pilot-installations in the following countries :

- Russia
- Czech Republic
- Slovakian Republic

These installations were funded by the Federal Ministry of the Environment (BMU).

Outside Germany the system is called **IRIS** (**I**ntergrated **R**adioactivity **I**nformation **S**ystem). IRIS is designed to allow the bilateral exchange of radiological data with the German system IMIS. Most important for a successful implementation of systems like IRIS and IMIS are communication-standards. Besides using the public transport-protocols like X.25 one prerequisite for exchanging data is the standardised DATAFORMAT Nr 7. Only when this format is used by the system the international bilateral data-exchange can be managed. All countries participating in a global networked system like **IMIS/IRIS** have the advantage of early detection and assessment of events that are potentially hazardous to man or environment **(early warning)**. This is the best way to fulfill the requirements of preventive protection of the population against the exposure to radiation in whole Europe.

3. INFOTHEK

IRIS is the **horizontal expansion of IMIS** for measuring radiological data. To expand the system vertically to monitor more environmental pollutions or - to go one step beyond - to monitor the production data of a power-plant you can use the system **INFOTHEK**. INFOTHEK is designed to combine all systems and their corresponding databases which operate in an enterprise like a nuclear power plant. As an example the following systems could be connected :

- Radiological data coming from IMIS/IRIS
- EMISSION MONITORING systems
- HEALTH AND SAFETY systems may be collecting data about exposure to radiation
- MATERIAL BALANCING systems
- DOCUMENTATION of equipment and process

.........you can imagine every application.

With INFOTHEK you can allow the access to all data of the connected systems. The user can navigate within the data with a mouse-driven menu and present the result of his request in different formats (list, spread-sheet, map, business-graph,...).

INFOTHEK connects existing or new systems via a network-infrastructure. The system is designed to access the data via the standard query-language SQL. Therefore it is very easy to connect systems with relational databases like RDB, ORACLE, DB2, etc. Access to other »non SQL«-databases can also be realized.

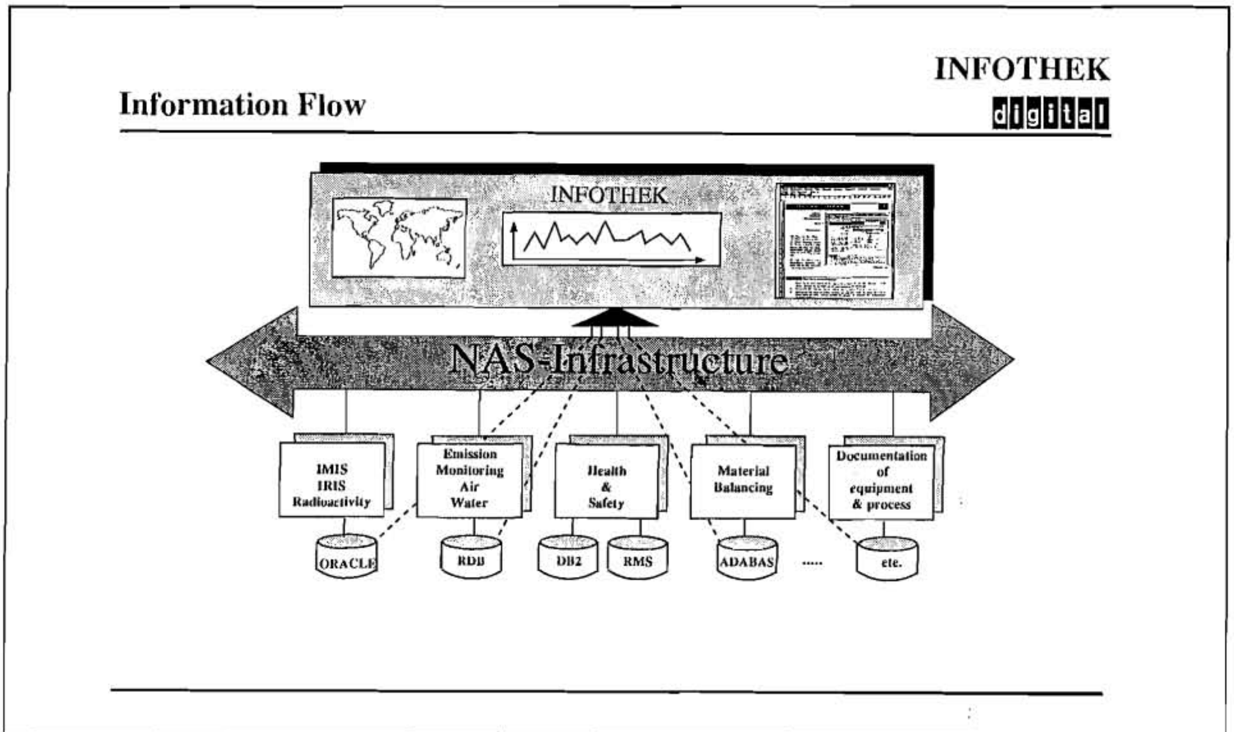


Fig. 3: Information Flow

4. Navigation

The easy userfriendly navigation in the data is implemented through an object-oriented data-modell which is the heart of the system and reflects the data-organisation of your enterprise. The system is designed and implemented with the advanced Object-Oriented methods in C++.

The user-interface on the top of the system interacts with this model. With the help of the OO-modell the user navigates in the meta-data until he finds th topic he is looking for. At this point the systems starts access only to the previously selected data. This is implented through the communication-standards which are implemented in the middleware NAS (Network Application support), a product of DIGITAL.

By this method the traffic on the network is reduced to a minimum.

You can see all the data of an enterprise represented in the graphic-window. Most of the data have a geographic relation to your nuclear power-plant. To get access to the data you can use another way by just clicking on the graphic objects. The graphic objects have a direct relationship to the data-objects defined in the data-model.

By selecting an object in this window you can zoom into the corresponding datasources.

By clicking on one of the boxes on the top window you get displayed the corresponding drawing of this particular machine. From there you can proceed further. Imagine the possibilities....

The advantages of this system-design are :

- Existing systems can easily be connected via standard interfaces
- Responsibility for the data stays at the originating systems
- Users have access to the original data - no old copies which are »out of date«
- Access can be limited for the different users through masks
- Data of different sources can be combined (The whole is more than the sum of its parts).
- Easy expansion and modification of the system by just adding the new data to the model.

ISU Informationssystem Umweltchemikalien Information System for Environmental Chemicals - New Developments -

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Abstract

Due to the fact that there are thousands of databases offered, there is an urgent need to establish information systems which describe other information systems and resources. In our research project granted by the Bavarian State Ministry for Country Development and Environmental Protection we set up three metadatabanks, one for manual sources, one for online databases and one for CD-ROMs. We put the emphasis on the subject of information on environmental topics of chemical substances. The structure of our metadatabase of online databases will be explained. A ranking approach for 15 online databases using the criteria size of the online database, update of the online database, cost of the online search, availability of the database at one or more hosts and the existence of the same information on other data-sources e.g. CD-ROM, tape, disc, print media is demonstrated. The ranking is carried out using Hasse Algebra and the corresponding Hasse diagrams.

1. Introduction

The online database industry continues to grow in terms of number of databases, size of database, and types of databases and it is also expending in terms of use and revenues. Over the time period from 1975 through 1992 the number of databases has grown by the factor of 26 [1]. The CD-ROM market is expanding exponentially. In the latest editions of TFPL, The CD-ROM Directory 1993 [2] and Meckler, CD-ROMs in Print 1993 [3] there are listed over 3500 titles available to the public. This means a ten-fold increase in three years [4]. The German directory entitled " Handbuch lieferbarer CD-ROMs" comprises information on more than 2600 titles which means it comprises four times as many titles as in the 1990 version [5].

There is an urgent need to establish information systems which describe other information systems or resources. This type of database is called **metadatabase**.

2. Metadatabases of Data-Sources for Environmental Chemicals

Data-sources which treat chemical and environmental aspects have an increasing importance these days [6]. Since 1987 we have been working on a research project granted by the Bavarian State Ministry for Country Development and Environmental Protection called "Information System for Environmental Chemicals". It consists of three different metadatabases which describe the contents, accessibility, and costs of retrieving information from numerous sources. These metadatabases are:

- DAMA: Databank of Manual Sources
- DADB: Databank of Online Databases
- DACD: Databank of CD-ROMs (offline databases).

Fig.1 gives an overview of the three metadatabases and their corresponding sources.

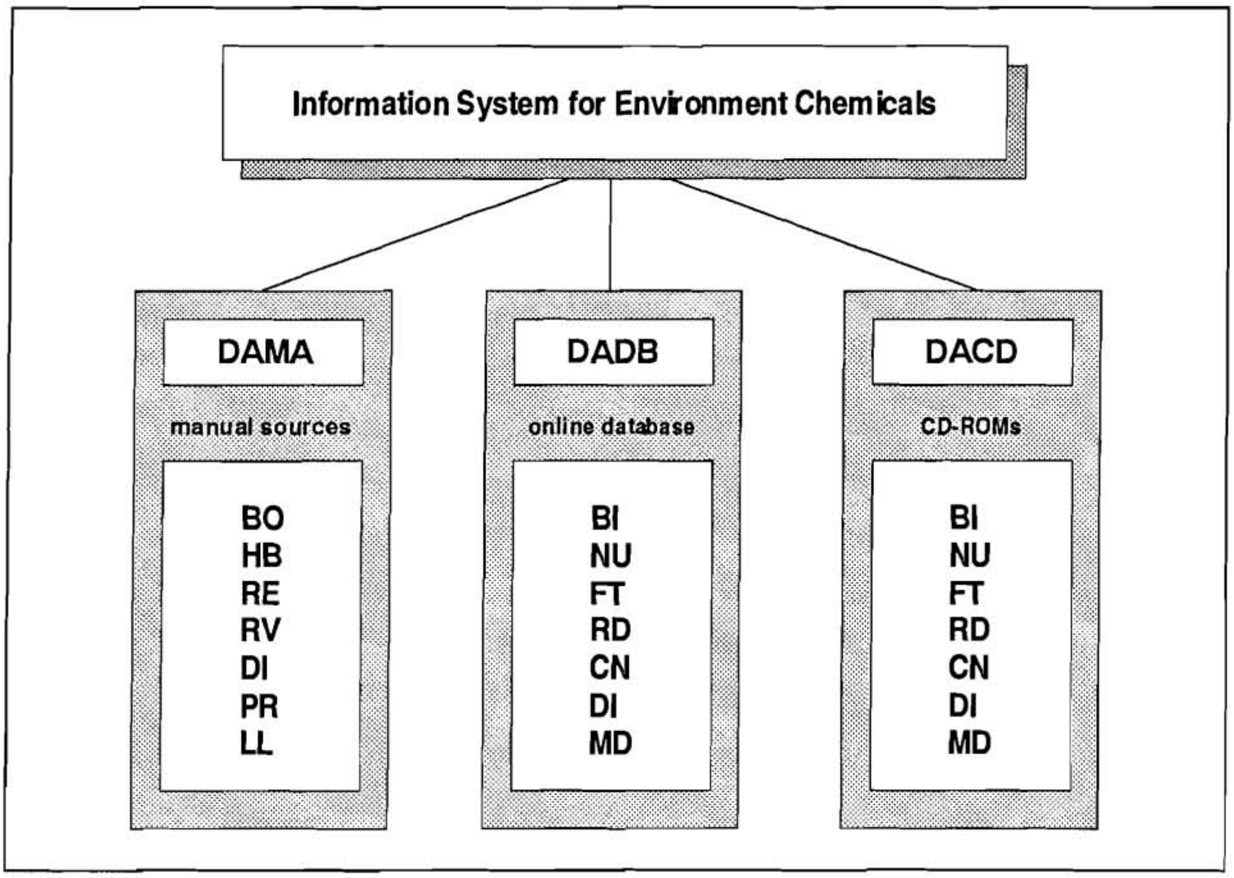

Fig. 1: Constituents of the Information System for Environmental Chemicals

Manual sources are divided into: books (BO), handbooks (HB), reports (RE), reviews (RV), directories (DI), proceedings (PR), loose leave publications (LL). Regarding databases (online databases and CD-ROMs) we distinguish between bibliographic, numeric, full-text, reaction databases, chemical name directories, directories and metadatabases (see chapter 3).

We use a commercially available database software package [7] to build up these metadatabases. This database system is explicitly developed for IBM AT compatible microcomputers under MS-DOS since version 3.X with a memory of at least of 640 KB. Network versions of the LARS software are available and used on the campus of the GSF Research Center for Environment and Health.

For the retrieval of information the commonly known Boolean operators can be used. Front, middle, and end truncation is possible.

In our paper we want to put the emphasis on the subject of online databases in DADB and the description of further enhancements of the Information System for Environmental Chemicals with regard to a new scoring approach.

3. Metadatabase of Online Databases (DADB)

The set-up of the databanks and the organization of data-fields is of upmost importance for the future effective work with these metadatabases.

The database software LARS distinguishes mainly between alphanumeric, integer, text and fulltext fields [7]. In our three meta-databases we make a broad distinction between administrative fields, bibliographical fields, technical fields (only for CD-ROMs) and fields which describe the content of a source. The exact data-field description of all three databanks DAMA, DADB and DACD is given in our final report of phase 2 of our research project mentioned above [8].

This metadatabase of online databases contains 28 different fields. Positions 1 to 4 are reserved to merely administrative functions. Then the so-called bibliographical fields like acronym, name of database, host, producer etc. are given. The most important fields of our databanks of data-sources for environmental chemicals are those which describe the content of the source, like the "descriptor" field, the "test-set of chemicals" and the "number of chemicals" field. These fields are exactly the same in all our three different metadatabases. For a comprehensive description of the content of a source we developed a thesaurus containing the key words which are of interest to the problem of environmental chemicals. We tried to incorporate in this thesaurus not only environmental aspects but also health and workplace exposure aspects. Because of the diverse nature of the data pertinent to the problem of environmental chemicals, we decided that the best way of evaluating the utility of databanks of data-sources was the collection of data on a testset of chemicals. We chose a testset of 68 chemicals. These chemicals have been evaluated in a different approach as potential food contaminants and results have been discussed in our previous publications [9, 10].

As there are online databases which contain hundreds of thousands of chemicals and others which only describe a couple of hundred, we created the field "number of chemicals". Therefore a rough estimation of the probability of success using a specific database is possible.

In DADB we incorporated relevant databases of the following hosts: BRS, CIS (Chemical Information Service), DATASTAR, DIALOG, DIMDI (Deutsches Institut für Medizinische Dokumentation und Information), ECHO (European Communities Host Organization), ESA (European Space Agency), GBI (German Business Information), ICSTI (International Centre for Scientific and Technical Information), ORBIT, Questel, STN (Scientific and Technical Information Network), VINITI (The All Russian Institute of Scientific and Technical Information) and some small hosts which offer only a few databases. With the exception of the two big Russian hosts ICSTI and VINITI we have online access to all other hosts mentioned above. As we have no online access to these Russian databases we have to rely on secondary information like personal communications, directories, reports etc. [11].

Table 1: Data-Field in DADB

Pos.	Abbr.	Field-name	Field-type	Entries
1	DO	Document number	Integer	Single
2	DA	Date	Date	Single
3	LO	Location	Alphanum.	Single
4	OF	Official in charge	Alphanum.	Multiple
5	AC	Acronym	Alphanum.	Single
6	NA	Name of database	Text	Multiple
7	HO	Host	Alphanum	Single
8	OH	**other Hosts**	**Alphanum.**	**Multiple**
9	PR	Producer	Text	Multiple
10	TY	Type	Alphanum.	Single
11	SC	Subject coverage	Alphanum.	Multiple
12	SO	Sources	Alphanum.	Multiple
13	LA	Language	Alphanum	Multiple
14	RE	Retrieval language	Alphanum	Single
15	TS	Time span	Alphanum.	Single
16	SI	**Size**	**Integer**	**Single**
17	UP	**Update**	**Alphanum.**	**Single**
18	YI	Yearly increase	Integer	Single
19	CO	**Costs/h**	**Number**	**Single**
20	ON	Online print	Number	Single
21	OF	Offline print	Number	Single
22	SD	SDI costs	Number	Single
23	SA	Search aids	Alphanum.	Multiple
24	NC	Num. of Chemicals	Integer	Single
25	DE	Descriptors	Alphanum.	Multiple
26	TE	Testset Chemicals	Alphanum.	Multiple
27	RE	**Remarks**	**Alphanum.**	**Multiple**
28	UP	Update	Alphanum.	Multiple

(highlighted fields explained in text)

DADB has 384 entries so far. We distinguish for environmental- chemical relevant databases the following types of databases:

Bibliographic databases (BI) which encompass the bibliographic information with or without abstract. The actual data on chemical substances can only be found in the primary literature. In numeric or factual databases (NU) the user can retrieve the wanted information, e.g. melting point of a chemical substance immediately. The same applies to full-text databases (FT) where the complete article can be retrieved. In addition we have the category reaction databases (RD) which only applies for chemical relevant databases. Famous examples for this type are CASREACT [12] and CHEMINFORMRX [13]. These chemical reaction databases do not only belong to this reaction type of database but contain in most cases bibliographic or factual information as well. As the importance of reaction databases is eminent in chemistry we incorporated these as a different type of database. Another type within this respect are chemical name directories (CN) for example CHEMNAME [14] and CHEMSEARCH [15] of DIALOG, and CHEMLINE [16] of DIMDI. The specific purpose of these kind of files is to provide substance searching and identification on the basis of nomenclature, trade names, synonyms, and other substructure searching techniques, such as ring data, element count, and molecular formula. Consequently these databases are also numeric databases according to our definition. Directories of trade names and institutions are classified as directories (DI). Metadatabases (MD) are also classified as a different database type.

4. Scoring Approach for online Databases

Information found in DADB is important and helpful and gives the user of this metadatabase a pragmatic tool to know where to retrieve information and data on environmental problems caused by chemical substances. In a further and deeper approach of the Information System for Environmental Chemicals we are in the beginning to develop a scoring system for databases. In many cases it is necessary and useful to select the most appropriate online database - in accordance with special items of interest (e.g. cost, update) out of the hundreds of datasources described in DADB. Therefore a priority setting procedure of databases which first ranks the databases and helps to decide which database is of high priority may save time and money.

Ranking systems are used in many countries to establish a priority setting procedure e.g. for existing chemicals. In Germany the Advisory Committee for Existing Chemicals called Beratergremium für umweltrelevante Altstoffe (BUA) developed such a concept for a priority setting approach for chemical substances [17]. In the United States, Japan, Sweden, the Netherlands, France etc. similar procedures have beeen developed and established.

Priority setting concepts for data-sources have not yet been developed but are -according to us- urgently needed. We are in the beginning to set up a scoring-system for online databases using the scientific background of Hasse algebra as part of the lattice theory and its graphical evaluation Hasse diagrams being partly developed in our Projektgruppe Umweltgefährdungspotentiale von Chemikalien (PUC) at the GSF Research Center for Environment and Health [18]. Hasse diagrams are tools to analyse large data sets before more sophisticated mathematical methods are performed. The so-called ranking analysis is only one of many possible applications.

In the field of environmental protection, Hasse diagrams have been used in order to rank chemicals according to their einvironmental hazard [19, 20, 21], to compare waste disposal sites [22], to compare mathematical models [23] and in QSAR (quantitative structure-activity relationship) studies [24].

In our field of application we study the influence of generally important criteria regarding online databases in order to rank a set of objects (in our case 15 online databases). The ranking of a set of objects (online databases) depends not only on the scores given but even more on the choice of criteria.

In our approach we perform a ranking for 15 relevant online databases for environmental chemicals. The evaluation criteria are the following:

SI	=	size of the online database
UP	=	update of the online database
CO	=	cost of the online search
OH	=	availability of database at other hosts
RE	=	existence of other data-sources, e.g. CD-ROM, tape, disc, print media etc. (remarks field)

These criteria are given in our DADB (Metadatabank of Online Databases) and are highlighted in Table 1. For the criteria existence of other data-sources we have not defined an extra data-field but store the information under the "remarks" field.

The scoring is carried out according to the a 6 number scoring system which is given in Table 2.

Table 2: Scores and their Meaning

5	=	excellent
4	=	very good
3	=	good
2	=	acceptable
1	=	poor
0	=	insufficient

The 15 online databases (objects) are given in Table 3.

Table 3: Online Databases (Objects) Scored with five Criteria

AC.	Object	Name
BI	BIOSIS	Biosis Previews
CA	CA	Chemical Abstracts
DI	DIPPR	Design Institute for Physical Property Data
TO	TOXALL	Toxicology Information Online
UL	ULIDAT	Umweltliteratur-Datenbank
BE	BEIL	Beilstein Handbuch der Organischen Chemie
HS	HSDB	Hazardous Chemicals Databank
PO	POLL	Pollution Abstracts
AG	AGRC	Agrochemicals Handbook
AQ	AQUIRE	Aquatic Information Retrieval System
CD	CHCD	Chapman and Hall Chemical Database
EC	ECDIN	Environmental Chemicals Data Information Network
DE	DETHERM	DECHEMA Thermophysical Property Databank

It is obvious that e.g. an online database which encompasses information on 100.000 chemicals is better than one treating only 100 substances. Hence the first one would be scored much higher. An online database which is updated every other week is definitely better than another one which is only updated irregularly. Furthermore, the less we pay the better the online database is ranked. If the user has the possibility the access the online database via various hosts, this database is more useful than another one which is exclusively available at one host. Many online databases are being made available through various forms, e.g. printed versions, online and CD-ROM. The user is free to choose the appropriate distribution form for his purpose. Consequently online databases offered though various ways are scored higher than those which are only available online.

The exact scores for our chosen 15 online databases are given in Table 4. According to Hasse terminology the online databases are objects, the numbers in the head row show the five criteria size (SI), update (UP), costs (CO), availability at other hosts (OH) and existence/remarks field (RE) mentioned above.

Table 4: Scores Given for 15 Chosen Online Databases

AC.	Object	SI	UP	CO	OH	RE
BI	BIOSIS	5	3	5	3	3
CA	CA	5	5	0	5	2
DI	DIPPR	1	1	2	0	0
TO	TOXALL	4	4	2	2	3
UL	ULIDAT	2	4	2	2	0
BE	BEIL	5	2	1	1	4
HS	HSDS	2	3	5	3	3
PO	POLL	3	4	1	5	0
AG	AGRC	3	2	0	1	4
AQ	AQUIRE	5	0	2	0	0
CD	CHCD	4	2	1	0	4
EC	ECDIN	5	2	5	0	3
DE	DETHERM	3	2	3	0	3
ME	MERCK	3	2	1	4	4
HO	HODOC	4	1	2	0	2

The corresponding Hasse diagram is given in Figure 2.

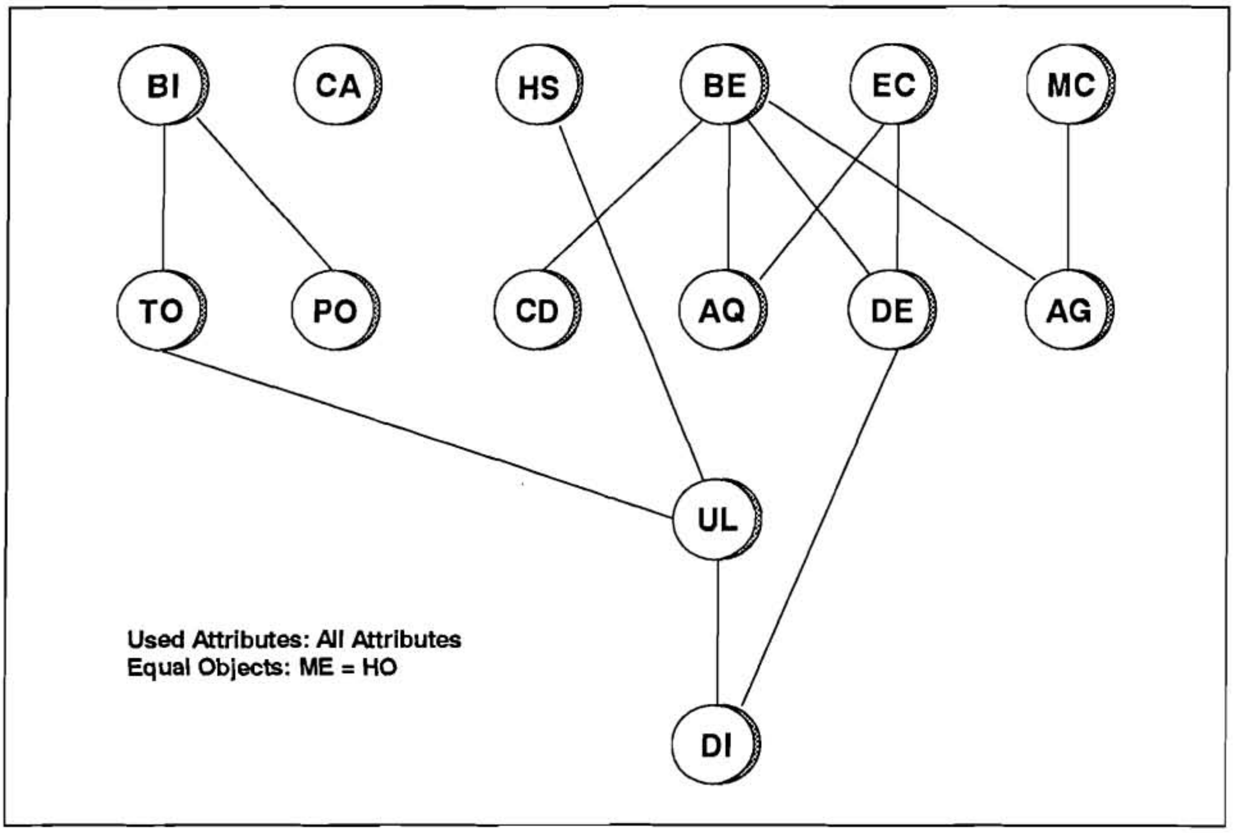

Figure 2: Hasse Diagram: Scoring Approach of 15 Online Databases

The diagram shows that there is no best online database (no "greatest object" in terminology of Hasse algebra) but the highest ranked online databases are BIOSIS, CA, BEIL, HSDB, ECDIN, MERCK and HOCD. These databases have the highest values with regard to our five chosen criteria. They are all so-called maximals. However these seven online databases are incomparable with each other. Considering for example the BEILSTEIN database, we find that BEILSTEIN is better than AQUIRE, AGRC, CHCD, DETHERM, and DIPPR but not comparable with the other maximals BIOSIS, CA, HSDB, ECDIN, MERCK and HOCD and furthermore not comparable with TOXALL and POLL.

Another interesting object is the online database CA. It is incomparable with any other chosen database. It is a so-called isolated object. Looking at the scores in Table 2 this phenomenon can easily be explained. The size of Chemical Abstracts is extremely huge, it is updated weekly and is available through various online hosts. On the other hand the CA file is rather expensive and is only available online and in printed version but not yet on CD-ROM.

Beside the isolated element CA which could be interpreted either as a minimal or a maximal, the Hasse diagram shows five minimals, e.g. objects which have no neighbours in downward direction in the graphic. These are the databases Pollution (PO), CHCD (CD), AQUIRE (AQ), AGRC (AG) and DIPPR (DI). Among these minimals the object DI is striking because it has many comparable objects which have better scores. Looking up the scores in Table 2, this is evident. However DIPPR is only a "minimal", not the smallest element. For example the object AG (AGRC) is a minimal too. AGRC has two scores less with regard to the criteria cost but has higher scores regarding all other criteria.

5. Conclusions

The information market is huge and still growing. This applies especially to data-sources in science and technology. The evaluation, comparison, and selection of the appropriate data-source, either manual source, online or offline database will become increasingly important with the growing number of publications. We decided to build up an Information System for Environmental Chemicals including metadatabases of data-sources and put the emphasis on the evaluation of sources regarding environmental and chemical-relevant information parameters. The ranking approach is a further important step in the effective retrieval for the information wanted. We intend to intensify the scoring system activities with regard to other online databases, other data-sources, e.g. CD-ROMs and different evaluation criteria.

References

[1] Williams, M. E., Highlights of the Online/CD-ROM Database Industry: Opportunities Through Technology, Proceedings of the Thirteenth National Online Meeting, New York, 4-6 May, 1993, 1-4, Medford NJ, Learned Information, Inc., 1993, ISBN: 0-938734-73-3.

[2] Mitchell, J., The CD-ROM Directory 1993, 9th Edition, London, TFPL Publishing, 1993, ISBN: 1-870889-30-4.

[3] Desmarais, N., CD-ROMs in Print 1993, An International Guide to CD-ROM, CD-I, CDTV & Electronic Book Products (Print Version), Westport, Meckler Publishing, 1993, ISBN: 0-88736-881-6.

[4] Information World Review, CD-ROM titles pass five thousand, Information World Review, **77**, January 1993, Oxford, Learned Information (Europe) Ltd, 1993.

[5] Scientific Consulting, Dr. Schulte-Hillen BDU (1993) Handbuch lieferbarer CD-ROMs, CD-ROM, CD-I, Multimedia, Darmstadt, Verlag Hoppenstedt & Co, ISBN: 3-8203-0273-5, 1993.

[6] Buchner R., Wunsch oder Wirklichkeit, Informationsverhalten und -bedarf in der chemischen Forschung - eine Marktuntersuchung, cogito, **1**, 8-15, 1993.

[7] WEKA Software für Wirtschaft und Verwaltung GmbH, LARS, Bedienungsanleitung und Handbuch, WEKA, Frankfurt (Friesenstr. 26), 1992.

[8] Voigt K., Pepping T., Informationssystem Umweltchemikalien, Abschlußbericht, GSF-Bericht 10/92, Neuherberg, GSF-Forschungszentrum für Umwelt und Gesundheit GmbH, 1992.

[9] Mücke W., Voigt K. and Schulze H., Approach for Identification of Hazardous Environmental Chemicals in Food, Toxicological and Environmental Chemistry **13**, 129-140, 1986.

[10] Voigt. K., Benz J. and Mücke W., Registering and Analysing Data on Detection of Chemicals in the Environment, Chemosphere, **21**, 12, 1429-1434, 1990.

[11] Voigt. K., Pepping T., Meta-Databanks of Data-Sources for Environmental Chemicals, in: Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) mbH, WINRE '92, 3rd Workshop on Information Management in Nuclear Safety, Radiation Protection, and Environmental Protection, Cologne October 14-15, 1992, GRS-96, Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) mbH, Köln, 113-122, 1993, ISBN: 3-923875-46-0.

[12] CASREACT, Host: STN, Karlsruhe, 1993.

[13] CHEMINFORMRX, Host: STN, Karlsruhe, 1993.

[14] CHEMNAME Chemical Name Directory, Host: DIALOG, Palo Alto, 1993.

[15] CHEMSEARCH, Host: DIALOG, Palo Alto, 1993.

[16] CHEMLINE, Host: DIMDI, Köln, 1993.

[17] Gesellschaft Deutscher Chemiker (GDCh), Beratergremium für umweltrelevante Altstoffe (BUA), Umweltrelevante Alte Stoffe, Auswahlkriterien und Stoffliste, VCH-Verlag, Weinheim, 1986, ISBN: 3-527-26617-8.

[18] Brüggemann R., Halfon E., A Systematic Way to Analyse Hasse Diagrams, Teoretical Base of the Program "Hasse", GSF - Forschungszentrum für Umwelt und Gesundheit GmbH, Neuherberg, 1993 (in print).

[19] Halfon E., Reggiani M. G., On Ranking Chemicals for Environmental Hazard, Environ. Sci. Technol., **20**, 11, 1173-1179, 1986.

[20] Halfon E., Brüggemann R., Environmental Hazard Ranking of Chemicals Spilled in the Rhine River in November 1986, Acta Hydrochim. Hydrobiolog., **17**, 47-60, 1989.

[21] Brüggemann R., Münzer B., A Graph-Theoretical Tool for Priority Setting of Chemicals, Chemosphere, accepted, 1993.

[22] Halfon E., Comparison of an Index Function and a Vectorial Approach Method for Ranking Waste Disposal Sites, Environ. Sci. Technol., **23**, 5, 600-609, 1989.

[23] Reggiani M. G., Marchetti F. E., A Proposed Method for Representing Hiearchies, IEEE Transactions on Systems, Man, and Cybernetics, **18**, 1, 322-330, 1988.

[24] Brüggemann R., Altschuh J., A Validation Study for the Estimation Aqueous Solubility from n-Octanol/water Partition Coefficients, Science of the Total Environment, **109/110**, 1991.

Electronic Archivation and Kurzweil-OCR

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It all started with an article in a distinguished german newspaper. We learned about a brandnew american invention, a machine that was able to read printed material, newspapers, typed documents and books, for the blind.

We were higly interested and curious and very soon went to America to see, what was behind this story.

We met a man named Raymond Kurzweil. He was the principal developer of KCP (Kurzweil Computer Products). His goal was, to solve the problem of omnifont (any type font) optical character recognition (OCR) and to apply the resulting technology to the reading needs of the blind as well as to other commercial applications.

It happened some 15 years ago, we brought the Kurzweil Reading Maschine to Europe and it was the very beginning of the CCS company.

The first Kurzweil Reading Machine (KRM), introduced in 1976, consisted of an image scanner developed by KCP that contained an electro-optical camera. The camera was mounted on an electro-mechanical "X-Y mover", which could move it in both vertical and horizontal directions. The camera scanned each line of print, transmitting the image electronically to a minicomputer. Using the OCR software, the minicomputer recognized the characters, grouped them into words and computed the pronounciation of each word. The resulting string of phonemes was sent to a speech synthesizer, which articulated each word.

The KRM was the first commercial product to successfully incorporate AI (Artificial Intelligence) technology.

After the KRM a refined version, the KDEM (Kurzweil Data Entry Maschine), designed for commercial applications was introduced. The KDEM could scan printed and typed documents and recognize charakters and page formats from a wide variety of sources, but rather than speaking the words, it transmitts them. It has been used to automatically enter documents into data bases, word-processing machines, electronic-publishing systems, and a variety of other computer-based systems. Many computerized systems move information from electronic form onto the printed page. The KDEM allows it to move back not just as an electronic image but in an intelligent form that a computer can understand and process further.

Further steps in developing the system have been made since that times and it is now a high performance data entry machine for professional users.

You will find these machines that now work on the Macintosh, DOS and different UNIX-platforms in numerous important enterprises all over the world.
When the first machines in 1978 were sold for $ 120,000 what meant not less than a quarter of a million marks, it is offered now for even less than DM 20,000.

Introduction

informare [lat.] form into, im-presse, print-on

Information is content, immaterial, mental, spiritual content. It is formed by a sender into a physical media and de-tected, de-coded by a receiver.

Information is based on the existence of both, a sender and a receiver. Information is transmitted between these poles and there is an exchange between sender and receiver.

Information is an original phenomenon, it is the basis of all relationship between men.

Information is the central term of our modern society; a society, thats characteristic feature is that people can exchange with one another at any time without any restrictions.

Action - information - reaction concur today, run fluently into one another. Circumstances permitting I get the information, that after an earthquake a tidal wave is scorching towards the coast of the japanese island of Hokaido earlier in germany than the japanese fisherman living at exactly this coast. Because my network of communication is better developed and my information channels are easier accessible than his. And I can listen to the news-correspondents presumtions about the victims to be expected in two hours time.

To have information means, to have an advantage, means, to have power. Information gives you a benefit.

That's true in private and in political life as well as in business life and in all economic aktivities.

The charakter of our media is responsible for the increasing flood of information. At first we are unable to distinguish between important and unimportant news. The matter of secondary importance is blown up and the marginal note of today may be of central interest tomorrow.
We find all these informations in different media and in different formats. We have to examine, sort, standardize, categorize, describe, list and file all these informations and have to hold them at disposal.

On top of that informations have repeatedly to be corrected, revised and completed; and in the multitude it is often hard to find the urgently needed single information. Informations are fugitive and they get lost.

The relevant deal with informations is a task that as a rule is not easy to be realized.

A modern Press-Archive as an Exampel for Information-Management and Archivation with Electronic Media

Taurusfilm GmbH & Co KG, Munich

Observing the press is one important basis for decisions

Today every large enterprise has to appear publicly. One of the basic suppositions is the thorough observation of media. Most enterprises have special departments for this purpose. These departments are responsible for observation, documentation and archivation.

From "traditional" to electronic archivation

Up till now "traditionally" all relevant articles in printed-media concerning the enterprise and its subjects of operation have been cutted out, pasted onto a sheet of paper, were copied and then passed as a press-review to a number of dedicated receivers among the managers of the company. On top of that these informations were stored sheet by sheet, categorized, described by key-words, were listed on card-indexes and stored in filing-cabinets.
We know from experience that large worldwide operating companies are confronted with about 750 relevant newspapers and magazines. Not very rarely these companies choose out between 250 and 300 articles daily for the purpose of information.
By installation of an electronic capturing- and managing-system, combined with electronic archivation, a company can take a decisive step in rationalization. Aditionally it is far more efficient in distributing and retrieve collected informations.

The CCS-frontend NewsClip and Kurzweil-OCR

Today newspapers and magazines are captured either with a Fujitsu-A3-scannern or with a special A2-newspaper-scanner that enabels you to scan the whole page at a time. The extraction of the desired articles out of the source-pages can be accomplished on the screen within a few seconds. Articles are pasted electronically to A4-pages and compound to a press review.
Beside different formal classificators - that can be found in the document - as the name of the publikation, the date of publishing, the volume number etc., the headline of the article is automatically recognised by the integrated Kurzweil-OCR and added to the created file.

Workflow

At a central workstation, the captured articles are looked at and every document gets a distinguishing mark. They determine the following treatment of the document.
A special attribut for example causes, that a document will be passed to the OCR-server running in batch-mode for automatic recognition of the full-text. Classificators, full-text(index) and faksimile data (in tiff-formate) are stored afterwards on different media, text-files in a data base on the server, image-data on WORM's in a jukebox.
At the same time, the document is inserted in a printer-queue and, following a pre-established key, printed out together with an automatically generated cover-sheet.
Supplementary the press-review is distributed electronically by fax or e-mail.

Full-text-retrieval
Documents, that have passed the determined workflow and have been succesfully stored to the archiv-system can be retrieved immediately.
Due to OCR-full-text-recognition you can look after a single term and you will find the desired article if it is available.
Retrival is no longer restricted to a list of key-words that before had to be administrated in the company carefully and with great expense.

Technical realisation
This solution for Taurusfilm was realised by connecting 10 client-PCs to a Data-General-Unix-server under TCP/IP.
Text-files are stored to the full-text-database BRS/search, faksimile-data are stored on 5,25"-Data-General-WORM-jukebox.

NewsClip the CCS Frontend for Press-Archivation

NewsClip is a frontend to capture text- and image-data from newspapers, magazines, reports, manuals etc..
NewsClip is a modular designed system that can be operated by a single user as well as it can be integrated in a network surrounding.
The system consits of different components.

NewsClip Scan/cut+paste
the software enables to scan the documents,
cut out the desired parts and paste them on to electronic A4 sheets
add index-information
pass it to a database

NewsClip Kurzweil-OCR
additional integration of the Kurzweil- OCR-module for automatic indexation
online full-text-recognition of any part of the document

Kurzweil-OCR-server
a Kurzweil-OCR-server, integrated in the network, is operating in batch-mode and automatically reconizes the content of all captured documents

WorkFlowManager
the WorkFlowManager is integrated in a network with multi-user frontends and is responsible for workflow under conditions of shared capturing
dustribution by fax or e-mail
batch-printing of the press review
automatic retrival according to pre-defined surch-profiles

Hardware workstations are PC's equiped with MS-Windows connected with a Novelle-server or UNIX-server (TCP/IP)

Scanner Fujitsu-A3-scanner for magazines, reports, manuals etc.
A2-newspaperscanner for newspapers

Archive Database CCS is an independent consultant for archive-systems, databases and archivation-media.
The frontend-data can be prepared to be imported into allready existing archiving-systems.

Data Bases of Chemical Compounds

B. Bussian
Umweltbundesamt, Berlin

How to Use the Database

Technical requirements

- Datex-P10H - Hauptanschluß
- preferable VT100/220 terminal or terminal emulation
- user registration at UBA-mainframe

For further questions and registration contact:

Umweltbundesamt
- FG Z2.8 / Gefahrstoffschnellauskunft -
Bismarckplatz 1
14193 Berlin

Umweltbundesamt
Fachgebiet Gefahrstoffschnellauskunft

The Objectives of the GSA

Gefahrstoffschnellauskunft

Fast information on dangerous chemicals and compounds

Information in case of Emergencies and hazards

Control of transport and handling dangerous chemicals and compounds

The GSA is restricted to official use at federal, state, and municipal offices and institutions under public law

Umweltbundesamt
Fachgebiet Gefahrstoffschnellauskunft

Subject Groups

Substance identification

Chemical und physical properties

Handling information and safety

Environmental impact

Umweltbundesamt
Fachgebiet Gefahrstoffschnellauskunft

Data Content

approx. 8000 chemicals, compounds, and products

approx. 250 properties can be retrieved

The yearly update comprises approx. 600 new data records

Umweltbundesamt
Fachgebiet Gefahrstoffschnellauskunft

Data Sources

BIG - Brandweerinformatiecentrum Gevaarlijke Stoffen, Geel, Belgium

Handbuch der gefährlichen Güter, G. Hommel, Springer Verlag

CHEMIS - database, joint project of the Federal Environmental Agency and the German Health Office

IdF - Institut der Feuerwehr, Heyrothsberge

Umweltbundesamt
Fachgebiet Gefahrstoffschnellauskunft

Outlook

Future developments are addressed to

- new data records
- fill gaps of information compound-wise

Concrete steps are

- registry procedure for chemicals, compounds and substance classes
- factual data modell

Umweltbundesamt
Fachgebiet Gefahrstoffschnellauskunft

Outlook
(continued)

A research and development project at FEA in collaboration with Beilstein - Institute has been started

The goal is

- integration of data of different sources to form a homogenous database
- *identification of information gaps and well defined* filling of these gaps

Umweltbundesamt
Fachgebiet Gefahrstoffschnellauskunft

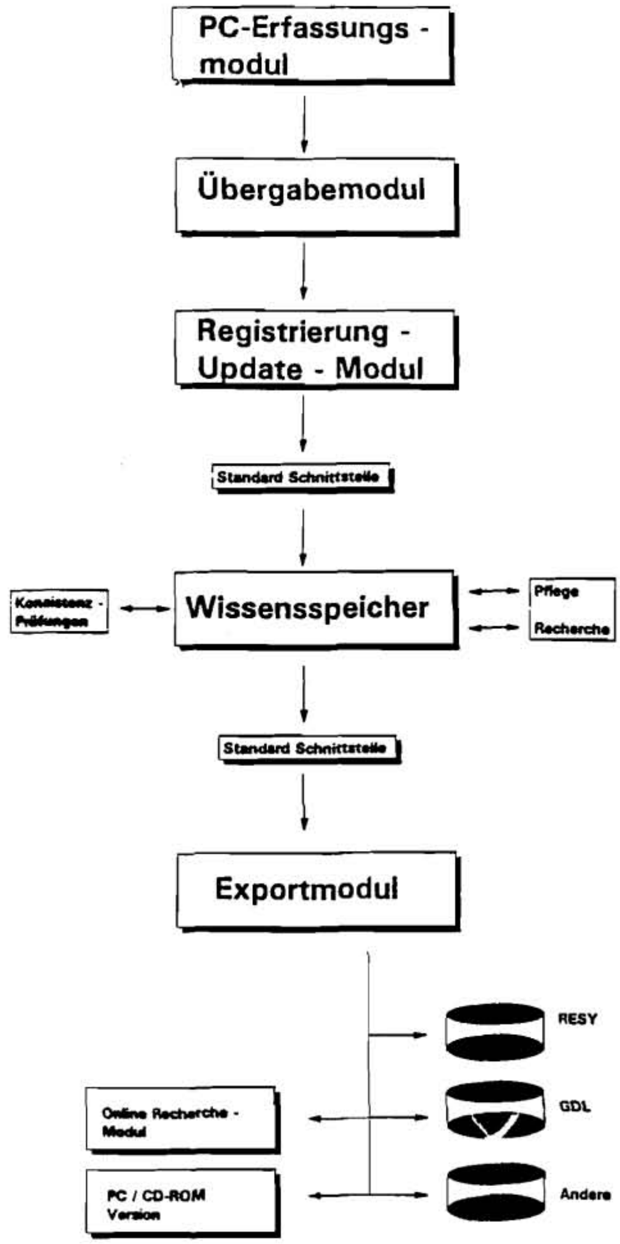
Outlook
(continued)

The GSA as a tool for practical use will be based on a factual database for chemicals (central database for chemicals - ZSD).

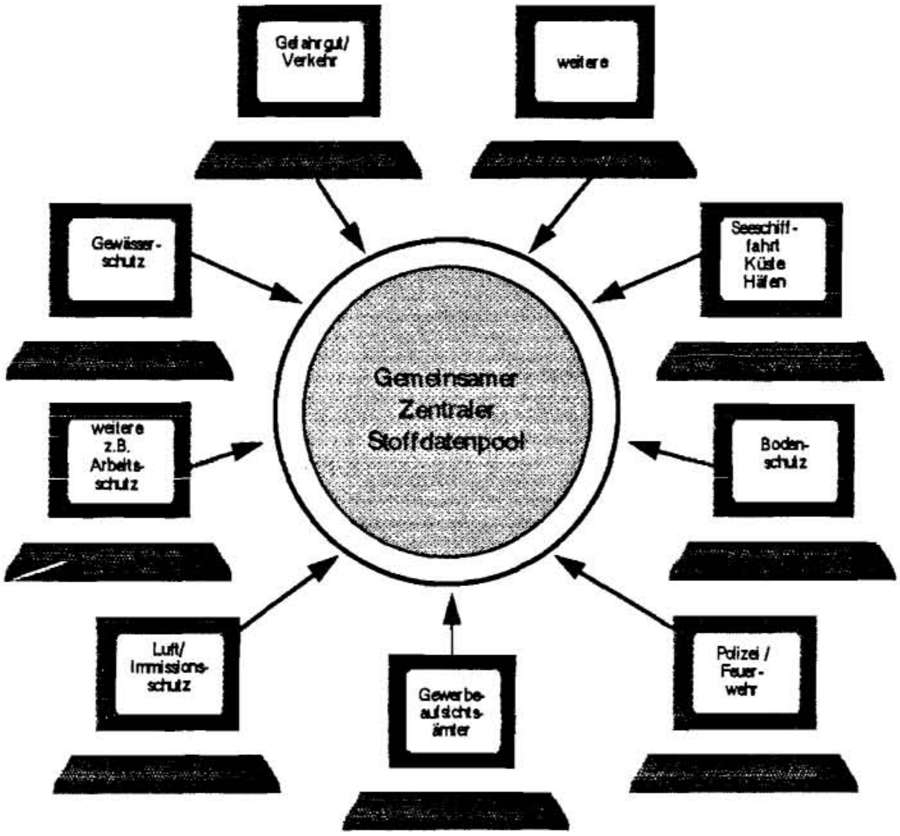
The data are input to federal / state - collaboration. A common data pool federal/state (GSBL) is planned.

The emphasis of ZSD and GSBL is on data relevant to quote environmental impact of chemicals.

Umweltbundesamt
Fachgebiet Gefahrstoffschnellauskunft



Stoffdatenbank
modularer Aufbau
Umweltbundesamt
Fachgebiet Gefahrstoffschnellauskunft



Anwendersichten auf den gemeinsamen Zentralen Stoffdatenpool

Umweltbundesamt
Fachgebiet Gefahrstoffschnellauskunft

DATEI/QUELLE: ______ DATUM: __.__.__ FOLIE/SEITE NR.: ______

```
POLIZEIMASKE            Kurzinformation des Stoffes          Bildschirm - K -
--------------------------------------------------------------------------------
 /1/  Gesucht wurde mit Stoffname=epichlorhydrin,
 STOFFNAME: Epichlorhydrin                                      Seite 1   von 4
 ---------------------------------------------------(C) Hommel/Springer Verlag
 SOFORTBEWERTUNG DER GEFAHREN NACH UNFAELLEN MIT GEFAEHRLICHEN STOFFEN
  Gefahren-  Gesundheitsgefahr: Sehr gefaehrlich! Aufenthalt im Gefahrenbereich
   Diamant                      nur mit voller Schutzkleidung und Atemgeraet.
             Brandgefahr:       Entzuendungsgefahr bei normalen Temperaturen.
     3       Reaktionsgefahr:   Heftige chemische Reaktion moeglich.
                                Verstaerkte Schutzmassnahmen. Loeschangriff nur
   3    2                       aus sicherem Abstand.
             Besond. Anweisng.: Wasser als Loeschmittel zulaessig
     W

  Hazchem-   Feuerloeschmittel: Spruehstrahl
   Code:     Koerperschutz u. Stoffbehandlung: Vollschutz; Eindeichen; Heftige
   2 W       oder explosionsartige Reaktionen moeglich.


 -------------------------------------------------------------------------------
(____)<-- Leer= weiter,   auf bestimmte Seite (z.B. 4S= 4.Seite),    - = zurueck
?= Hilfe V= Vollinfo F= Fund. SV= Stoffverz. M= Masken D= Druck S= Suche E= Ende
 Anzahl der gefundenen Informationen: 1                     1992-11-05  17:14:28
LTG                                             TAST
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Suchergebnis als Kurzinformation (default): 1. Sofortbewertung der Gefahren

DATEI/QUELLE: ________ DATUM: ___ FOLIE/SEITE NR.: ___


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POLIZEIMASKE                       Stoffsuche                      Bildschirm   - S -
------------------------- Eine Angabe ist ausreichend -----------------------------

  Stoffname----->(epichlorhydrin____________________________________________________)
                 (__________________________________________________________________)

                 Den Stoffnamen bitte nach Moeglichkeit genau eintippen.
                 Der Stoffname kann andernfalls auch gekuerzt werden (z.B.:
                 Arsentri..), die Suche kann dann etwas laenger dauern und
                 zu einer groesseren Menge Stoffe fuehren. Bitte etwas Geduld.
-----------------------------------------------------------------------------------
  UN-Nummer----->(____)                                     z.B. 1561

  CAS-Nummer---->(___________)                              z.B. 1327-53-3

  EG-Nummer----->(____________)                             z.B. 033-002-00-5

  Summenformel-->(__________________________)               z.B. As2O3

  UBA-Nummer---->(_______)  z.B. 10636    Hommel-Nummer-->(_______)   z.B. 812
-----------------------------------------------------------------------------------
(?_) <-- Leer= weiter     SV= Stoffverzeichnis      V= Vollinfo      M= Masken
           ?= Hilfe       BL= Bildsch.loeschen      E= Ende    /  danach ENTER
                                                          1992-11-05  17:13:41
LTG                                                 TAST
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Polizeimaske: Suche mit einem Stoffnamen (und Anforderung von Hilfe)

Concept of the BfS Data Bank System of Materials used in Nuclear Installations

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Bundesamt für Strahlenschutz, Salzgitter

ABSTRACT

Informations on material behaviour, e.g., due to ageing and decisions on possibly resulting backfitting measures require a large amount of data concerning, among others, mechanical/technological values, physical properties, chemical content, irradiation behaviour, and corrosion properties. Such data have to be stored in an appropriate data bank system in order to ensure an easy and promptly access in the case where these informations are required (for example evaluation of an unusual event). This paper describes the current approach for the concept of a BfS data bank system taking into account - as far as possible - already existing data and data structures in different German institutions. Main issue is the correlation between the used materials and its properties and behaviour on the one hand and the respective components in the investigated nuclear installation on the other hand.

1. Introduction

In the Federal Republic of Germany, nuclear power plants are in operation since more than twenty years, the latest generation (PWR of Konvoi-type) about five years. As in other technical disciplines the development of science and technology in the material field is an ongoing process. Hence, a lot of different materials for comparable components has been used in the nuclear power plants according to the respective state of science and technology.

In particular in the case of older nuclear power plants ageing effects due to irradiation or other operational impacts have to be investigated and evaluated. For example, comprehensive discussions in 1993 were concerned with the question of crack initiation and crack increase of pipings made of austenitic steel of some nuclear power plants (BWR type) detected during in service inspections.

Due to the fact that the documentation of the vendors and utilities concerning material data is of different content and depth with a decreasing amount of recorded and easy available data in case of older nuclear power plants, a data bank system of used materials is necessary and helpful.

On the other hand, different institutions in Germany have collected and, partially, evaluated material specific data but, of course, restricted to the special points of view which are important for the respective questions and tasks.

The Federal Office for Radiation Protection (Bundesamt für Strahlenschutz - BfS) a federal institution in the portfolio of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit - BMU) needs for its tasks in the field of nuclear safety a data bank system correlating the used materials and the respective components established in the nuclear power plants.

The first approach for a concept of such a data bank system must take into account some important boundary conditions:

- the data bank system must be compatible with the total information management concept of the BfS as described in a separate paper [1],

- at a final stage the data bank system should be enlarged to a information system; this has already to be taken into account in the developing phase of a concept,
- the information contained in the system should be comprehensive but resticted to informations required for the tasks of the BfS,
- a user-friendly surface is necessary in order to ensure the use of the data bank system, in particular in those cases where the information is needed within a very short time period.

2. Report on existing material data banks

As indicated above, the first step has been the search which data and data structures concerning materials used in nuclear installations already exist in different German institutions. This search has resulted in the fact that indeed a lot of different data banks have been established or are planned. However, only some data banks provide those informations which could form the basis of a nuclear technology data bank system. In other cases, the content is of less interest but the data bank structures give hints for the establishment of the intended BfS data bank system. In the following the main relevant extern data banks are described; at the end of this section data banks of general interest and special data banks (e.g. for HTR-materials) are discussed.

a) SIEMENS, KWU, Erlangen

SIEMENS had built up a material data bank early in the first years of the seventies. This data bank system contains values from acceptance tests of KWU components of pressurized water reactors (PWR) and boiling water reactors (BWR). The actual structure of the data bank is not compatible to modern data bank systems. Moreover, the manufacturers and operators have to permit the access of external users.

b) Staatliche Materialprüfungsanstalt (MPA), Stuttgart

The MPA uses a data bank which contains experimental results of the research project "component safety of small and big specimen of different materials in the reactor pressure vessel area". Characteristic values of loaded and unloaded materials are stored. The aim of the data bank is to predict the radiation behaviour of materials. An expert system contains some "leak-before-break"-data of nuclear power plants [2]. Experimental results in the field of high temperatures fatigue are stored in a knowledge based computer documentation system (WIZE [3]). Material data are stored in different MPA data banks, however not yet related to components in nuclear power plants. A knowledge based documentation data bank for the description of the condition of nuclear power plants is intended.

c) GRS, Cologne

The data bank TECDO-online [4] contains, among others, data of safety reviews, system descriptions and training data, emergency manuals, operation expertises, quicklook reports, calculation codes, technical reports, German regulations in full text and including images. TECDO-online is helpful to collect information and to evaluate and screen these documents. Special requests are necessary to select relevant material data. More information about TECDO-online is given during this workshop. An access to TECDO-online will be realized by BfS at the end of this year.

d) RWTÜV, Essen

The material data bank SOLMAT of the RWTÜV [5] has been developed within the EC research project "demonstrator program material data bank" in 1984/85. Requests are possible in the dialogue form. This data bank system contains information about set values of 4700 metallic materials which are partly used in nuclear technology. Results of material tests of steel and nonferrous metals are stored. The aim is to gain material parameters, specifications and standard data for the investigation of operation behaviour and damage analysis.

e) Data banks of general interest for BfS

At the Bundesanstalt für Materialforschung und -prüfung (BAM), Berlin, a standard specification data bank on welding is planned. After its completion it may be of special interest for the BfS. At the University Hannover, Institut für Werkstoffkunde, a decommissioning data bank has been built up within the European Community Project "ECDB-Tool". It contains information about cutting and handling technology, decontamination and dismantling technology of large components. The input of data and completion of work is planned at the end of 1994. The data bank structure based on Oracle has just been established. A lot of commercial data banks (INIS, MDF, METADEX, STEELTUF, ...) is available at the Scientific & Technical Information Network (STN), Karlsruhe

[6], but no special data bank of materials used in nuclear installations. They mainly contain chemical analyses and informations on material properties.

f) Further considered data bank systems

The contents of the following data banks are less relevant for BfS, their structure, however, may be of more interest. The data bank of TÜV Rheinland, Cologne, contains more than 10 million acceptance tests of manufacturers and own test data. Materials and components in nuclear power plants are not correlated. The research centre Jülich (KfA) uses a data bank for metallic materials of high temperature reactors (HTR) [7]. Also the international HTR data bank of Petten (Netherlands) contains characteristic data of materials used at high temperatures [8]. Within a special research project SFB 300 the University Hannover works on a material data bank about forging. The VDEh (Verband Deutscher Eisenhüttenleute) data bank is used to investigate representative parameters of long time high temperature strength (long time behaviour of German steels at higher temperatures). Data of about 19.000 creep tests and 7.000 tensile tests of 49 sorts of creep resistant steels and Ni alloys are stored. The material data bank of IMA Dresden (Institut für Materialforschung und Anwendungstechnik) contains information about nearly 1500 steels, ferrous and nonferrous metals [9]. Technological and physical parameters are stored together with the forms of delivery. It is used to compare materials and to find manufacturers of the material.

3. Utilization possibilities of a material data bank by BfS/BMU

A material data bank has different utilization possibilities, determined by the tasks of the BfS.

a) Support of the national incident reporting centre

Material knowledges are of increasing interest with respect to the evaluation of unusual events. The support of the national incident reporting centre located in the BfS especially requires different informations in order to answer material related questions. The correlation of nuclear power plants, systems, components, structures, locating places, the material and changes of the material parameters (ageing, lifetime) are of special interest. A material data bank system should ensure the quick answering of these questions in case of demand.

b) Support of BMU in case of material questions

In order to support the BMU in all questions concerning material problems a comprehensive knowledge on material characteristics is necessary. This task will be fulfilled more easily with the help of a data bank system.

c) Initiation of backfitting programmes

A further task of the BfS is to report the status of backfitting concepts and to initiate backfitting programmes. Therefore, it is necessary to know the material data and the current parameters of a nuclear installation in order to initiate appropriate and safety enhancing material backfitting programmes. The large number of data only can be organized using a data bank system.

d) Initiation of investigation projects on material problems

The initiation, supervision and control of investigation projects concerning material questions requires an overview of earlier results and the data of different experimental parameters. This helps to avoid inhomogen data structures in future plannings, and allows, in particular, to fill existing gaps.

4. Concept of the BfS data bank system

The structure of a comprehensive nuclear technology data bank system is shown in Fig. 1. Its modular structure contains all relevant data of a NPP from design until decommissioning state. Such a comprehensive data bank system is expensive and in principle only realizable in case of new NPP projects because the necessary data are not available to BfS.

However, it is reasonable and worthwile to develop the most important parts of this modular system for existing NPP. These parts are shown in Fig. 2. They shall form the basis of the planned BfS material data bank. The screened connections between the different modules can be understood as direct connections or access possibilities. A material key is a relevant information to connect the different data banks. The origin of informations is important to evaluate the reliability of the data. The material application, especially the correlation between nuclear power plants, systems, components, structures, location places, materials and material parameters as well as changes of these parameters are of central importance. This new data bank system uses existing data banks.

As a first step, the development of a simple data bank structure using Oracle as a basis is planned; in parallel, necessary data are collected. The application of Oracle ensures - at a later stage - the implementation in the BfS network. It is expected that some tenthousend single data shall be stored in the material data bank system.

5. Possible ways to get input data

Different ways to gain relevant informations for a material data bank system are possible.

The access to an existing or planned external complete data bank or data bank with partial results is helpful (for example STN data banks). Chemical analyses, results of tensile tests, hardness etc. may be gained. The online access to external data banks is advantageous because parallel development is avoided and permanent actualisation guaranteed.

Existing plant documentation, safety reports, KTA specifications, DIN records, research reports etc. can be analysed with respect to material problems. This leads to partial results because the underlying documents do not contain the necessary information in detail.

The data bank BEVOR of GRS (input of data by BfS since 1993) contains information from more than 4000 unusual events in German nuclear power plants. The integration of this important existing data bank means a significant decrease of costs, because parallel developments are avoided.

The results of national advisory comissions which are available to BfS can be analysed. Sometimes their recommendations include technical documents which are helpful in order to gain relevant data.

In order to develop the BfS data bank system, all these different sources shall be used as far as possible and manageable.

6. Conclusions

The establishment of a BfS data bank system on materials used in nuclear installations (mainly nuclear power plants) is planned in order to fulfill the different tasks of the BfS, e.g., in the area of incident evaluation with respect to materials question, the evaluation of material ageing or life time extension of components/systems and the initiations of investigation programme, for example concerning test and surveillance techniques in order to get information on material behaviour changes at the earliest stage. Such investigations support the increase of safety margins.

It is intended to make use of already existing data bank systems as far as possible and to integrate the relevant data in the BfS system or to get an easy access to external data bank systems in case of demand, even under time pressure.

A first approach for the concept of such a BfS data bank system exists where type of nuclear power plant, systems, components, location of the respective component within the plant, and used materials are collected and correlated.

Due to the intended modular structure selected information should be collected for already existing nuclear power plants; in case of new reactor projects it seems to be worthwile to store all available relevant informations.

This planned data bank system is embedded in the total information technique of the BfS. As a first step of the further procedure, the current situation concerning material data banks used in nuclear installations shall be discussed within the German Reactor Safety Commission. Possible recommendations of this advisory body of the BMU shall be taken into account. This discussion is expected at the end of this year. Afterwards, first steps of the development of the data bank system are planned.

References

[1] D. Meyer, F. Piefke, Information Management in the BfS; The Wide Area Network as Base of the IT-Applications, these proceedings

[2] ESR - A Large Knowledge-based System Project of European Power Generation Industry, A. Jovanovic and K. Maile, Expert Systems With Applications, Vol. 5, pp. 465-477, 1992

[3] Design and implementation of a knowledge-based computer documentation system in the field of high temperatures fatigue (WIZE), A. Jovanovic, K. Maile, P. M. Schäfer, W. Bernstein, D. Weiss, 18. MPA-Seminar, Stuttgart, 8. und 9. Oktover 1992

[4] TECDO-online, Technische Dokumentation kerntechnischer Informationen, K.-A. Höpfner, J. Keusenhoff, U. Riedel, 17. GRS Fachgespräch, Cologne, 1993

[5] Die Werkstoffdatenbank - ein Element der internen Qualitätssicherung bei der Auswahl legierter Stähle, G. H. Mück, VDI-Tagung "Rostfreie Stähle", Würzburg, 30. Oktober und 1. Dezember 1993

[6] Datenbanken aus Wissenschaft und Technik, STN International Fachinformationszentrum Karlsruhe

[7] Die Werkstoffdatenbank der Entwicklungsgemeinschaft Hochtemperatur-Reaktor, H. J. Penkalla, M. Offermann, Kernforschungsanlage Jülich, Institut für Reaktortechnik

[8] High Temperature Materials DATA BANK, Commission of The European Communities, Joint Research Centre, Institute for Advanced Materials, Petten Site, Netherlands

[9] "Werkstoff- und Sortimentsvergleich", Anwendungsdokumentation, Dez. 1992, Institut für Materialforschung und Anwendungstechnik GmbH, Informationszentrum Werkstoffanwendung, Dresden

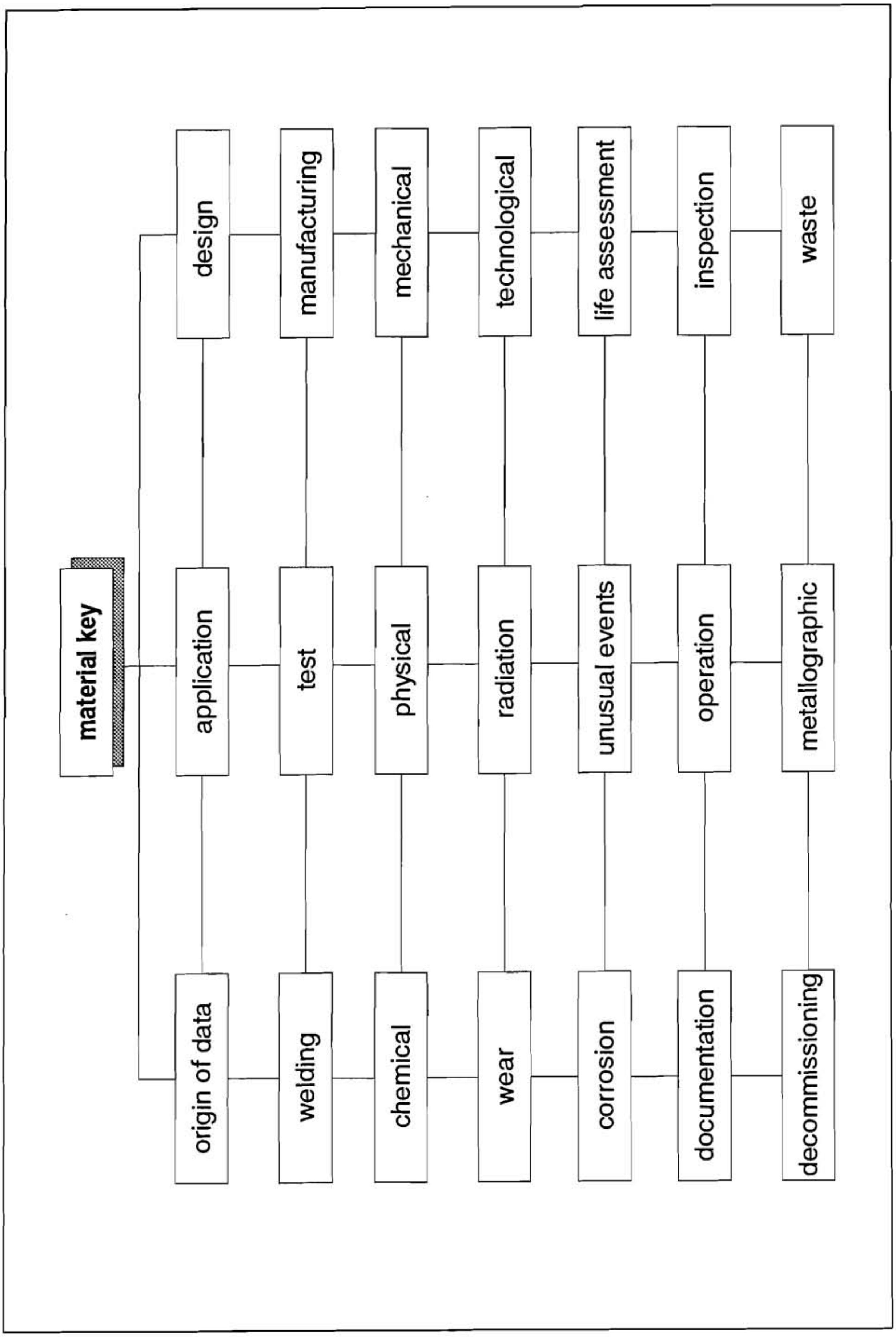

Fig. 1: Modular Stucture of a NPP Data Bank System

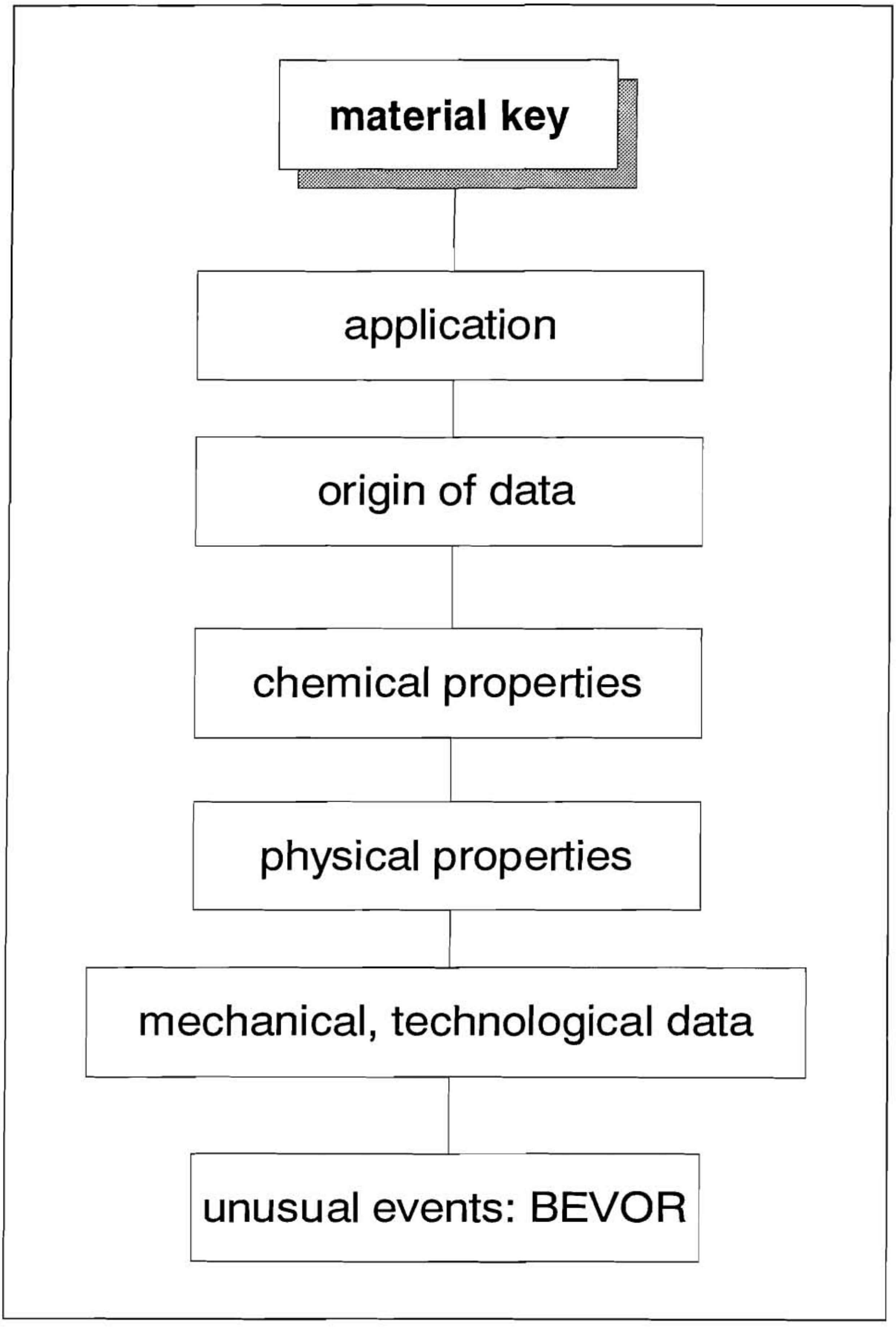

Fig. 2: Modular Structure of the BfS Data Bank System

***TECDO*-online - Technical Plant Documentation**

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Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) GmbH, Köln

Abstract

Up-to-date operating experience is an important component for the further improvement of the safety of nuclear power plants in the Federal Republic of Germany. In this context, GRS has been evaluating for many years the operating experience at home and abroad. The performance of the related tasks requires in all cases detailed information about the design, the operating processes and the safety-related condition of the plants concerned.

***TECDO*-online** is the modern plant-information system of GRS which transports the needed information to the expert's PC-workplace with the **full text containing illustrations and drawings**. The main ideas behind ***TECDO*-online** are:

- **central collection, expert processing and evaluation** of the information,
- **decentralised availability** of the information via a **user-friendly menu and display**,
- **current relevance and compatibility of data.**

The system is now fully operational and increasingly used. It presently contains approx. 120.000 pages of full text, 40.000 images (illustrations, drawings and pages of text that were recorded like illustrations) and data on a further 25.000 large-scale technical drawings from the central GRS-drawings archive.

1. Introduction and Tasks

With its interdisciplinary know-how in all important areas of reactor-safety technology and its practical knowledge of nuclear power plants, GRS is capable to perform expertly the evaluation of operating experience, using the normally available documents of nuclear power plants at home and abroad. However, the plant-specific expert knowledge necessary for the detailed evaluation of operating experience remains mainly with the internal documentation and the personnel of the respective nuclear power plants. A detailed evaluation and corroboration of the results must therefore fall back on this particular knowledge.

The past has shown that in many cases neither the necessary up-to-date documentation of the respective plants nor the necessary plant-specific expert knowledge were directly available for the individual examinations. This information sometimes first had to be collected and processed, which has proved to be too time-consuming in the context of safety analyses and investigations of special events, which often have to be carried out at short notice. Due to the importance attached to the operating evaluation, a systematic procedure as regards the availability of the required documentation became necessary, also in particular with taking the increasing amount of operating experience and problems that have to be evaluated into account. Therefore the BMU/BMI asked GRS to build up a DP-supported information system on the expert know-how necessary for the evaluation of the operation of nuclear power plants.

***TECDO*-online** is a modern information-management system which systematically collects and expertly processes on a large scale **full texts** and **images** of documents which are available on various data carriers in different forms and languages as well as in different quality; they are then quickly available on the screen when they are needed, like e.g. in accident situations. The centrally stored information is simultaneously available to a large circle of users thanks to the linking of the PC-workplaces in a network.

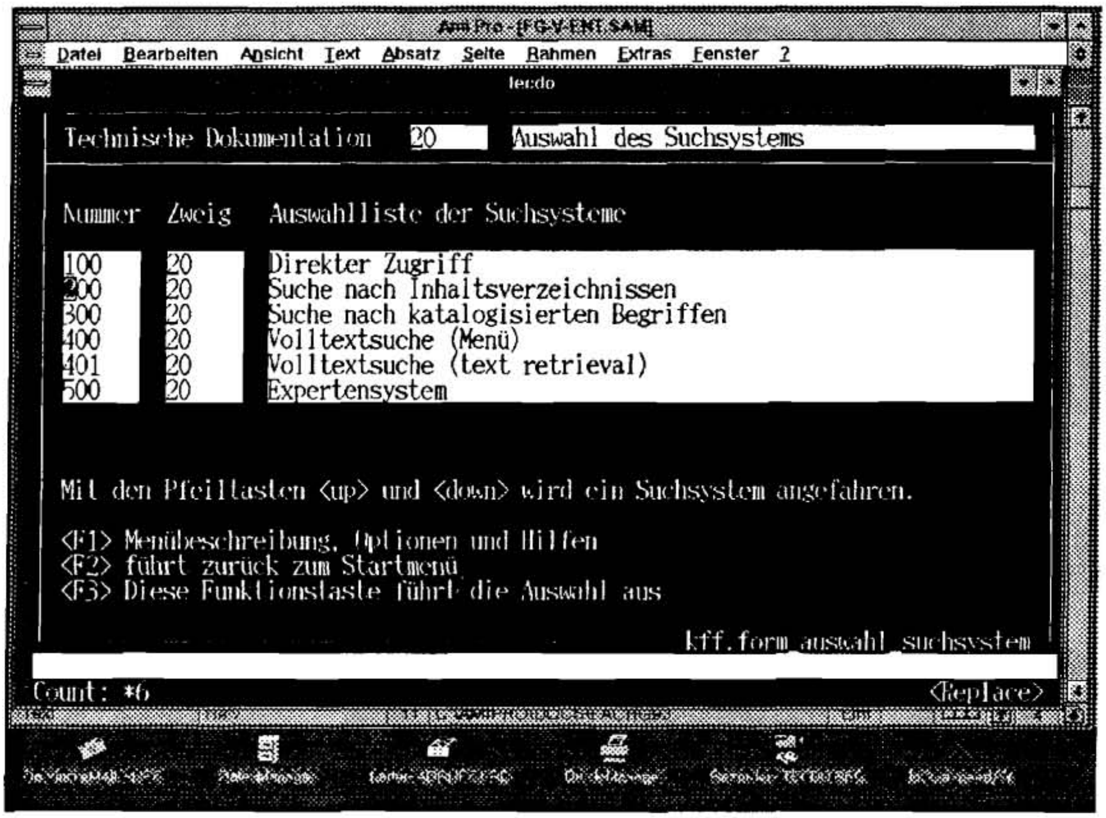


Fig. 1: ***TECDO*-online** table of contents (main categories)

Along with the immediate provision of information for the evaluation of operating experience, ***TECDO*-online** also has the following tasks that are especially relevant to the BMU:

In the case of special events occurring in nuclear power plants at home and abroad, the BMU can quickly call up comprehensive and factually correct information and evaluate the event at short notice.

In the case of emergency situations or damage on a large scale, the BMU can react quickly and help in decision-making regarding which action to take.

If necessary, the system can link as an expert information-exchange instrument into the emergency centre to be established at the BMU.

The provision of up-to-date and detailed plant documentation, as it is prescribed e.g. in KTA-rule 1404, Annex B, is a basic prerequisite for this.

GRS has been and still is playing a leading role in practically all national issues on reactor safety. The extensive amount of information gathered in over 30 years of close relations with the nuclear industry, nuclear power plants and research institutes is permanently conserved as well as made quickly available by ***TECDO*-online**.

The intensive co-operation of GRS with international institutions also enables or facilitates the acquisition of data on plants abroad. In this context, the joint GRS/IPSN-office in Paris as well as the technical offices in Moscow and Kiev will in particular be of great use to the acquisition of information about European nuclear power plants.

In the course of data acquisition, processing, editing, evaluation and management, there is intensive co-operation between the technical departments of GRS in order to acquire the data and structure the data bank in accordance with the needs of the users.

2. System Configuration

The hardware and software of ***TECDO*-online** are arranged in an advanced client/server architecture (Figure 2). The user connects from the normal Windows menu on his PC (Figure 3) via certain programme products with various computers on which the searches are carried out and which provide the required information, sending it on to the user's PC.

In this system configuration, all texts are stored on the GRS mainframe computer; the images, on the other hand, are decentrally stored in the workstations of the local networks. Centralised storage of texts has proved successful (keywords: data security and management) because even very long transmission ways do not effect the call-up speed on the PC-workstation. In the case of the images, however, satisfactory call-up speed could only be achieved by decentralised storing due to the considerably larger storage space needed.

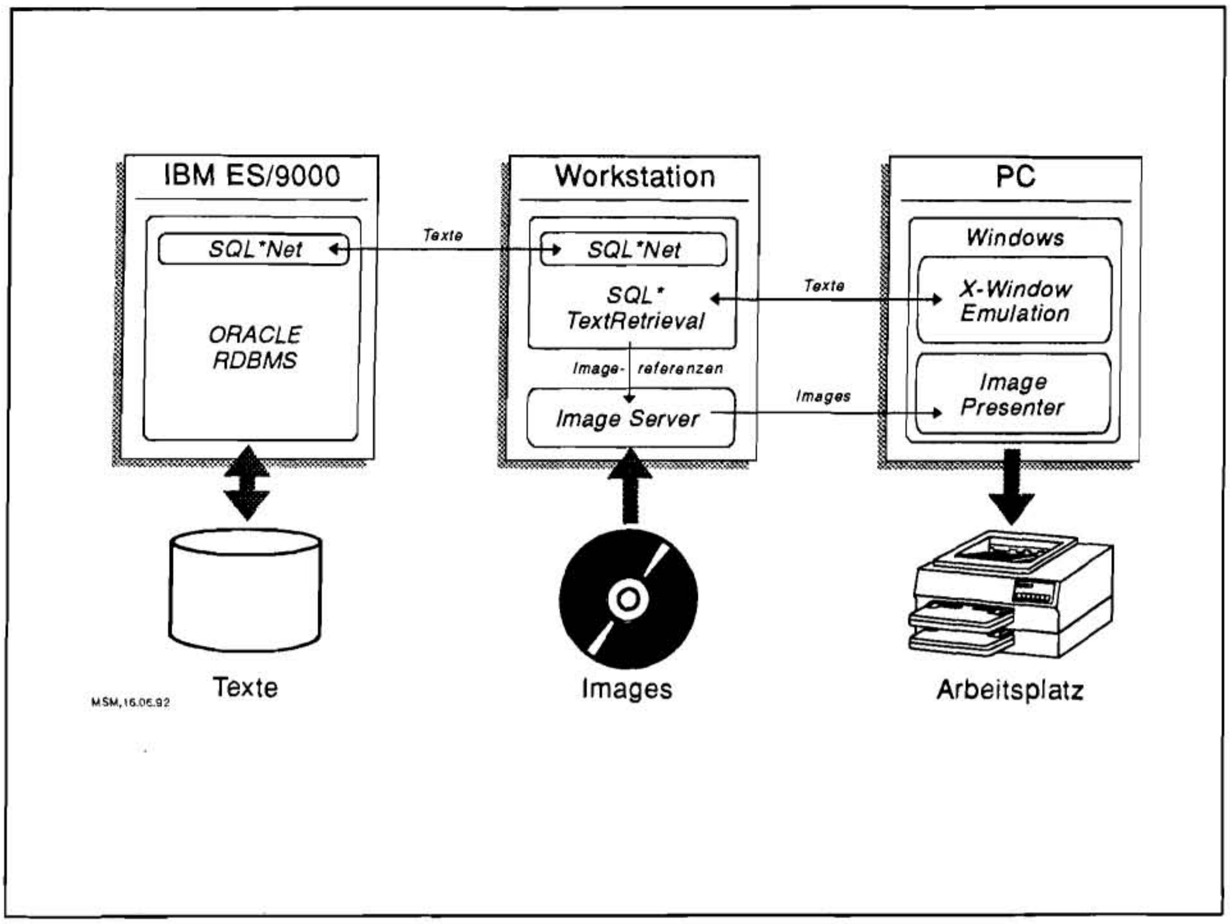


Fig. 2: ***TECDO*-online** system configuration

Detailed menu guidance enables the user to search via the window of the MS-Windows application where all the textually-related information and results (text-client) are presented which have resulted from the retrieval strategy. The menu guidance is a GRS-development carried out with the corresponding tools of the ORACLE (see further below) data-bank-management system.

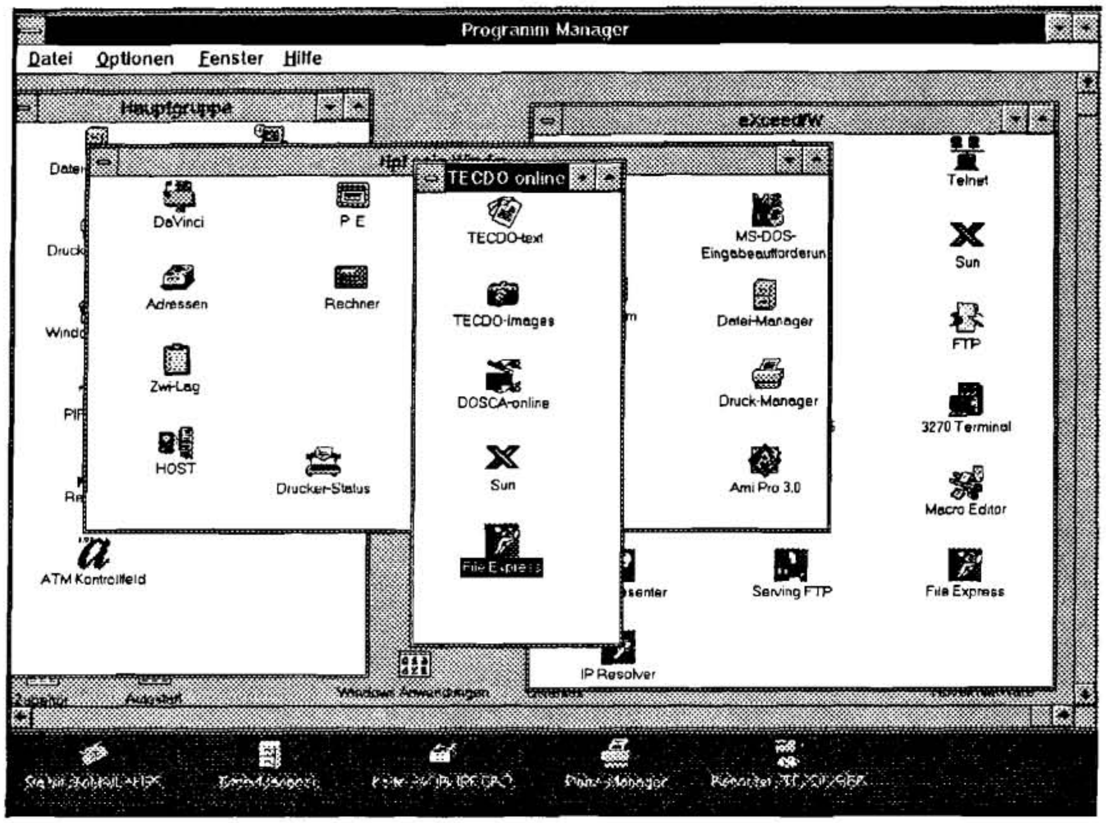


Fig. 3: ***TECDO*-online** on a MS-Windows user interface

Hardware

The following are the main hardware components within this system architecture:

- IBM ES/9000 mainframe at Garching,
- Data General AV 4606 workstations, currently at Garching and Cologne,
- PCs (desk-top computers) of the users at the respective locations.

These computers are integrated in the GRS Local-Area Networks (LANs) at Cologne, Garching and Berlin; these LANs are in turn interconnected via permanent lines of the Federal Post Office to form a Wide-Area Network (WAN). The BMU's LAN is also connected to the WAN of GRS via such a permanent line.

In principle, it is possible to include other local networks into the system. With the current configuration, this requires permanent lines or dialling lines to the GRS-network. Eligibility is strictly restricted to applicants that have been approved by the BMU, who will make the application for them. At present there is a link being prepared to the Federal Office for Radiation Protection in Salzgitter.

Data-bank management system

***TECDO*-online** is based on the relational data-bank-management system (RDBMS) ORACLE for the processing of data and full texts. ORACLE works according to the SQL-standard (Structured Query Language); as an open system, it provides interfaces for the programming of menus. The main products for handling the stored texts are

- ORACLE as text server on the mainframe,
- various ORACLE-components (e.g. SQL*Plus, SQL*Textretrieval) as text clients on the workstations,
- the XWindows Emulation on the PCs, which enables the use of ORACLE as MS-Windows application on the PC via the workstations.

ORACLE has sophisticated tools for password protection available. Staggered access controls guarantee that the confidential data will only be revealed to a narrowly defined circle of users.

Image-processing systems

An important pillar of ***TECDO*-online** is its option to include illustrations, tables and technical drawings as images. In order to speed up retrieval times, modern image servers (systems for storing and processing images) are used which store the images in condensed form and transmit them directly to the user via the GRS-network. The introduction of the image-processing system 'FastFind' has provided new possibilities for the processing of these images. Among other things, this system makes it possible to comfortably zoom in on image details and 'navigate' in large-scale drawings.

If the search leads to documents including stored images, the mainframe will transmit the image addresses to the corresponding image server, i.e. to the workstation in the LAN of the respective user. The user can then change on his PC from the»Text« to the»Image« (FastFind) window and, by menu guidance, look at these images and manipulate (scroll, zoom, print, etc.) them. Image Server and Image Presenter are programme products that were specially developed for ***TECDO*-online** by Data General on the order and with participation of GRS.

The main products for handling the stored images are

- the ffis_grs programme as Image Server on the workstations,
- the FastFind programme, representing the Image Presenter as MS-Windows application on the PC; the PC thus becomes an Image Client.

Quick-scroll system

Since FastFind allows for the quick scrolling between provided images on the PC, extensive documents that so far were only available in printed version can now be processed as image files. This way, ***TECDO*-online** provides e.g. the operating manuals which often have several thousand pages. After retrieval, the user is led from the manual's table of contents to the desired chapter, whose text and illustrations are stored page by page in facsimile. Thus there are now tools available which make it possible to process very large quantities of data, without great losses in terms of detection, in a much more economical way than in full-text recognition. As ***TECDO*-online** image processing uses the so-called TIFF format, there is the guarantee that images can also later be added to electronic text recognition, if necessary.

3. User Guidance

User-friendliness was a priority in the development of ***TECDO*-online** in order realise easy handling of the system even for the occasional user. ORACLE makes it possible to design menus in any desired form in such a way that requirements for the search can be met without any system-related restrictions.

Menus are designed under the condition that they are self-explanatory and can be used without an instruction manual. The following search strategies have been realised:

- Content-guided search.
  Search via the tables of contents, depending on the various types of documents.
- Full-text search.
  Search via all relevant words of all stored full texts.
- Search via keywords.
  Search via additional technical terms from Thesauruses or keyword lists. These keywords are issued by experts along with the text for the detailed description of the contents and also to make the documents easier to find.
- Direct access (so-calld electronic reference library).
  User's own note pad for marking documents and search paths for quicker retrieval of information that has already been searched for before and is frequently needed.

The so-called retrieval approaches are introduced in self-explanatory menus. The set menu options are being modified according to the needs of the user in the course of the on-going operation of the system. The system is furthermore open to user requests as long as they concern the addition of certain documents, the creation of differenciated retrieval and processing options, and the programming of special menus and input layouts.

To simplify user guidance, a model has been developed which allows the entire retrieval process to be carried out by using no more than three function-keys.

- **F1**-key:
  Help
  This key opens a window which shows the user the complete options menu.The required function can be selected from this window (Fig. 4).

Fig. 4: ***TECDO*-online** with open»Help« window

- **F2**-key:
  BackThis key returns the user to the previous level.
- **F3**-key:
  NextThis key leads to the next level or performs the requested retrieval.

4. Contents

***TECDO*-online** now incorporates a large stock of texts, images and other data, some of which are rather complex. As the storing of full texts in DP-systems is very time-consuming and labour-intensive, the mass of documents needs to be formally processed with the least possible effort. Thus, the data is stored on electronic data carriers wherever this is technically possible. Other data is scanned and made available either as image or as retrievable full text via subsequent optical- character-recognition (OCR) procedures. Extensive paper documents are stored in facsimile.

Along with the technical plant documentation, further information categories have been included, like e.g. background information and information concerning general aspects of several plants. The documents and data contained in ***TECDO*-online** can at present be classified in the categories given below.

TECDO Plants

The processing of technical nuclear power plant documentation mainly covers the reactor plants operated in Western countries. LWR-plants of German vendors are treated in particular detail. For the evaluation of operating experience, the following information is especially important:

- design and configuration of the buildings,
- design and data of the primary and secondary systems,
- instrumentation-and-control systems and electricity supply,
- design, tasks and functions of the safety systems, e.g. shut-down, emergency cooling and residual-heat removal, emergency-power supply containment,
- design, tasks and functions of relevant components,
- design requirements for accident management(basic spectrum of accidents, framework conditions),
- plant and systems behaviour under normal conditions as well as during incidents and accidents,
- experience with the operation of components, systems and plants,
- general technical information if necessary for accident evaluations at short notice,
- administrative and technical regulations concerning emergency measures.

Typical document types of plant documentation are e.g.:

- data collections in the form of quiocklook reports
- safety-analysis reports
- descriptions of systems and functions
- technical drawings
- training documents
- operating manuals
- crisis and emergency documents
- operational expert analyses
- licensing documents
- results of periodic safety assessments

GRS working results and external technical reports.

Along with the technical documents on the nuclear power plants in the old *Länder* (states), data from the plants in the new *Länder* (states) have already been added to a considerable degree. They comprise e.g. the following documents from Unit 5 of the Greifswald plant: operating regulations, examination regulations, lists of locks, lists of limit values, lists of measured data, the limitations and conditions for safe operation, descriptions and circuit diagrammes of systems as well as the results of safety assessments.

The documentation activities regarding East-European nuclear power plants that are currently being performed concentrate on the plants at Rovno (Ukraine) and Balakovo (Russia).

The safety-analysis reports (FSARs) and training documents of the most common reactor lines of American vendors have already been incorporated as retrievable full texts. For the other US-plants, the available opportunity to update the FSARs every 12 to 24 months as a complete microfiche library is currently still used.

The electronic processing and provision of reports on special events and of GRS-*Weiterleitungsnachrichten* (information notices) as well as of the USNRC Information Notices is continuously kept up.

Reports and data relevant to operation supplied by the NPP-information services of the IAEA are step by step integrated in ***TECDO*-online**. At present, all available OSART and ASSET-mission reports of the IAEA are electronically stored.

TECDO Drawings

As one of the most important information sources from the engineering point of view, a central image archive has been established at GRS which now contains more than 25,000 large-scale technical drawings (blueprints). Parallel to putting the drawings on microfilm, their bibliographical data has been electronically processed and is now retrievable via ***TECDO*-online**. The original drawings are centrally administered at GRS Cologne. The Berlin and Garching branches were each provided with a set of drawings on microfilm and the corresponding reading devices. Here, the user receives direct reference as to where to find the original drawing and the corresponding microfilm card. Methods are already being used to scan microfilm cards and include them as images into the data production of ***TECDO*-online**. For financial reasons, however, only selected drawings are processed in this way in order to be able to provide a basic and as uniform as possible stock, classified according to technical aspects, of system-circuit diagrammes, building cross-sections, component drawings etc. of all operating German plants. In this context, the adoption of CAD-drawings produced elsewhere is growing more and more important.

TECDO Standards

The retrievable full-text documentation of standards presently comprises the following codes and guides:

- selected guidelines from the reactor-safety manual,
- KTA-rules,
- «Code of Federal Regulations, Part 10, Energy«, and
- NRC Regulatory Guides.

The inclusion of French and East-European rules and regulations will follow shortly.

TECDO Commissions

Information from committees and commissions is constantly required by GRS and its customers. To meet this demand, corresponding data banks are now being established. The RSK-data bank (PARK) is already operational. Due to the confidentiality of its data it is only available to a restricted circle of users (it should be noted here that when electronically storing any data, GRS as a principle always observes the copyrights as well as its contractual obligations to the customer by staggering the limitations for user access accordingly).

TECDO R&D

In this category, work has begun on processing and providing final reports of national and international research projects, e.g. the 2D/3D-project.

TECDO Know-how

- **GRS working results**
  GRS-reports and GRS-A-reports (contractual working reports) published after 1st January 1992 have been included in ***TECDO*-online** with full texts and images.
- **ARCHIVE**
  is a further component of the storing of know-how in ***TECDO*-online**. This is a collection of the cover sheets (containing title, project-identification number, person in charge, etc.) of the individual files that were put on microfilm during the clearance of old files at the Cologne branch. The full-text search via the cover sheets results in the direct reference to the corresponding microfilm. This way, 1.5m pages of original documents are readily available on microfilm and can be read with the help of reading devices.

***TECDO*-theque**

***TECDO*-online** also contains background information and general information concerning several plants, related external data banks, reference manuals and dictionaries, e.g.:

- lists of NPPs (world-wide),
- Power Reactor Information System (IAEA),
- Research Reactor Database (IAEA),
- International Nuclear Event Scale NPP,
- technical dictionaries,
- lists of technical terms,
- power-plant-identification systems.

5. Data Processing/Evaluation

5.1 Reference data

The variety of different kinds of documents to be included in ***TECDO*-online**, from technical drawings and minor documents only counting a few pages (e.g. quicklook reports) to extensive documents that often comprise several files (e.g. operating manuals), requires on the one hand a flexilble structure of the formal registration criteria, but on the other hand also needs the possibility to retrieve the desired documents via a particular retrieval strategy.

The experience with ORACLE and FastFind under ***TECDO*-online** has shown that there is the necessary freedom for the development of the reference-data structe. In order to retrieve the required information more directly and in less time from the documents presently stored in ***TECDO*-online** and those yet to be included, those documents have to be structured even more clearly than they are now.

The structure of the reference data (information about the stored files) is designed as an organisation and administation framework. Thus a document always consists of a clear identification, the reference data, the attached images and (if existant) the texts.

The reference data are divided into directly attributed data like e.g. title, author, date, drawing-identification number, etc., and the data which is attributed to the document in separate tables. Belonging to the latter type of data is the classification which places the document in a position in the table of contents of the technical documentation. Other data, like e.g. concerning plant or system, serve for the systematic differentiation in menu-guided retrieval. In a similar way, the document is provided with a number of keywords which can originate from various keyword catalogues. Detailed data like memorandums or administration notes are finally included in different tables; the more or less serve the internal administration. The separate tables facilitate necessary changes or additions and make access easier.

In the context of the development of image processing on the one hand and also for the link-up with similar information sources and other, not full-text-related files, general retrieval strategies were developed which mainly relate to the reference data. It is important that during the search no information available in the system goes unnoticed. The current form of menu guidance is a first step in the direction of such a general retrieval strategy. Other tools and methods are being developed. For example, in addition to conventional full-text retrieval, the retrieval via structured tables of contents of stored image files is being optimised; this way, extensive documents (e.g. operating manuals) become retrievalble as image files.

5.2 Evaluation of contents

An important step in the evaluation of documents is the compilation of keywords, i.e. the reference to key expressions and technical terms relating to the content of the text, which further characterises the document. Keywording is especially important for those documents which are stored entirely as images and which furthermore have no clear structure and are thus not retrievablevia a table of contents. Keywording requires corresponding expertise in nuclear engineering, which is necessary for understanding the conent of the document, putting it into the right context, and knowing about the importance that it may have in the framework of the main objective of the project: the evaluation of operating experience and the assessment of the safety of nuclear power plants.

The prerquisites for keywording are strictly defined lists of keywords which are kept centrally for the various kinds of documents. The broad range of document types (from systems-related technical documents, e.g. descriptions of system, to comprehensive analyses, e.g. GRS working reports) requires different keyword catalogues, relating to the particular type of document. Expertise in nuclear engineering is also needed for the compilation of these catalogues.

The succes of a search often depends on the knowledge of the synonyms which are associated with the keyword. If, for example, the keyword is the German word»*Sicherheitsbehälter*«, then it will also be advisable to look up the English word»containment«. With the help of so-called lists of synonyms, it is possible without any further action required from the user to associate individual keywords with other keywords or, if necessary, with abbreviations (e.g.: *Reaktordruckbehälter, RDB,* reactor pressure vessel, RPV). These lists of synonyms are drawn up on the basis of experience with typical searches and are activated if the type of document requires so.

Another form of help in evaluating documents comes with the so-called Thesauruses, i.e. lists of words relating to one topic area on which a search can build. These Thesauruses are developed as to the extent to which they are required and are integrated into the user guidance.

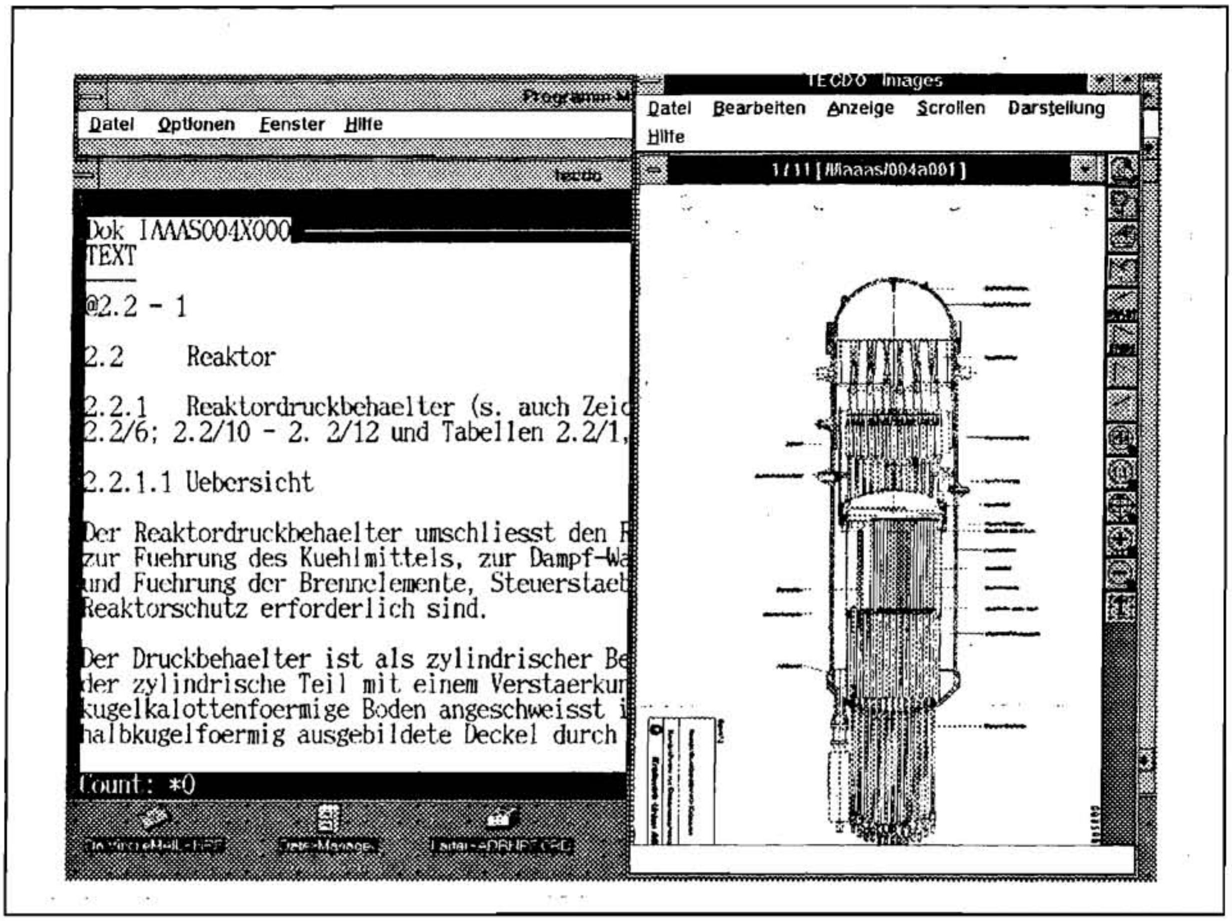
6. Summary

With ***TECDO*-online**, GRS has a high-capacity central information system available in which the information on the evaluation of operating experience and on safety assessments of all kinds can be collected according to technical criteria and which can make this information accessible for further use. ***TECDO*-online**is constantly being updated with regard to practical experience and user-frienliness. Once developed, a user interface is open to improvements suggested by its use. The coupling of text and image has been solved in an optimal way, and improved methods for the analysis of full texts have been implemented. The process of issuing the documents and retrieval lists has been realised. In a first version of a flexible menu guidance that is capable of adaptation, the path to intelligent searches using the methods of a knowledge-based system has been chosen. Selection lists can be ordered which facilitate the search and the related work. Each user has the possibility of drawing up his own personal lists of documents and retrieval paths to relive him of some of his work. The layouts are designed in such a way that, if necessary, the lists and documents can directly be worked on.

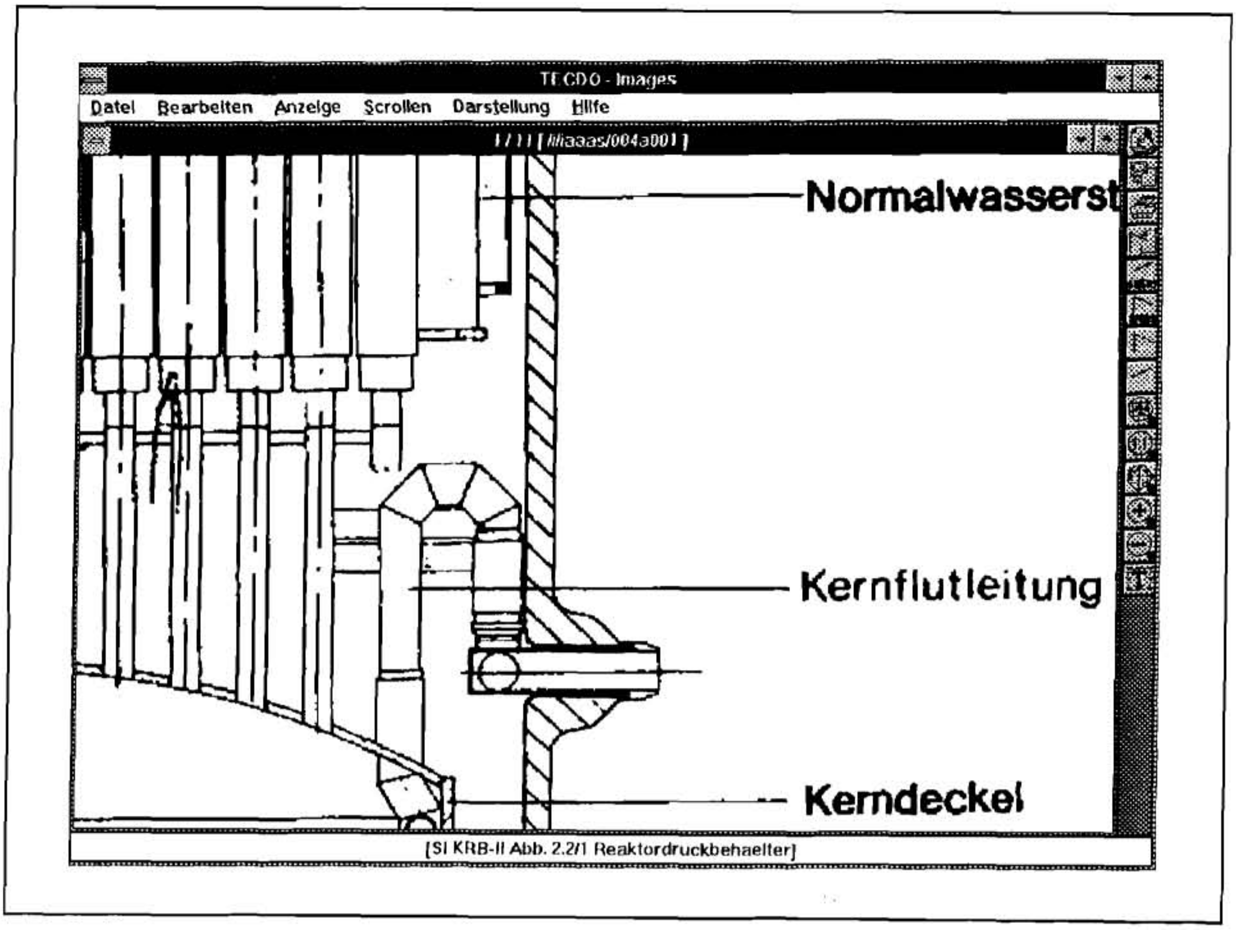
The traditional retrieval components, e.g. field-orientated search, word searches or keywords, are available. New, structuring retrieval strategies, e.g. via classification units and tables of contents in full texts or image files, have been introduced for a further increase in user-friendliness and are continuously being developed.

***TECDO*-online** is designed as a so-called»living documentation« and will therefore remain open to any new developments and documentation aims. Due to this flexibility and potential for development, it is possible at any time to implement any new requirements to contents and structures.

7. Examples



Example No. 1: Text of the safety report KRB-2 with illustration showing the reactor pressure vessel



Example No. 2: Navigating through the drawing, zoomed section of the illustration. Partial view of the RPV with core-flooding line

Session IV

Information Management in the Private Industries

Chairwoman: K. Voigt

Experiences with European Information Marktes from Everyday Consulting Practise

P. Drotos
Arthur D. Little International Inc., Wiesbaden

SYNOPSIS

The world market is the most significant business information source available today. Through the use of such techniques as online databases, market research methods, and competitive intelligence techniques a creative and aggressive researcher for practically any industry or technology can create management intelligence reports about supply and demand patterns, selling and purchasing trends, distribution channels, and potential replacement products and technologies.

A competent researcher using modern retrieval and research techniques to probe the world market can forecast and report important technological, industrial, and market trends.

Since business information is essentially information about buying and selling, every transaction in the industrialized countries produces information as a by-product. Smaller transactions are cumulated as statistical information, and larger transactions often are documented in press releases or in the financial or industrial press. Every transaction reveals information about the buyer and the seller, their financial situation, their plans and their strategies. To flourish a company needs only five elements: capital, labour, raw materials, production technology, and markets. However, all of these elements are constantly changing, and every changes leaves traces of information. A researcher who uses online and other research techniques to report and analyze these changes for management will produce competitive advantages through information for his employer.

BUYING AND SELLING

The world market is the most significant business information source available today. To understand why the world market is the essential information source, one should ask first what is business information.

Business information is news about buying and selling. Every transaction in the industrialized world produces information as a by-product. Leonard Fuld wrote some years ago that every time money changes hands, information is created. The billions and billions of dollars, marks, francs, and yen traded every year also create enormous amounts of information of inestimable value. Smaller transactions are cumulated as statistical information, and larger transactions often are documented in press releases and in the financial or industrial press. But what is the significance of all this information? It may have inestimable value but it possesses also unimaginable volume. Why bother?

QUESTIONS AND ANSWERS

Nevertheless, the world market answers significant questions such as :

What goods and services are on offer?
What goods and services are **not** on offer?
What goods and services are being supplied?
What goods and services are being bought and sold?
When are they bought and sold?
Where are they bought and sold? (Door-to-door, at the discount store, at a luxury boutique, in a department store, on the telephone?)
What else could be bought and sold, that is not on the market?

PLANS AND STRATEGIES

Answered simply, every transaction reveals information about the buyer and the seller, their financial situation, their plans and their strategies. If I complete a transaction here in a boutique in Cologne for a filmy black silk negligee and present it to my girlfriend when I return from this conference she will have complete insight into my financial situation, my plans and my strategy. Well-informed companies quickly recognize the financial situation and strategy of their competitors. They use this knowledge to create competitive advantages for themselves.

ADVANTAGES AND DISADVANTAGES

Possessing competitive advantage can change definitively the rules of the game in an industry. New methods or technologies in procurement, production or sales can eliminate obsolete industry structures, and the competitors who still use them. Just-in-time procurement in Japan has assured car makers over there of significant advantages over Detroit, Torino and Wolfsburg. The Independent newspaper in London won significant profits over its Fleet Street rivals through modern word and graphics processing technology. Through information technology companies can penetrate earlier and easier than ever before new product markets and geographic markets. Consultants at Arthur D. Little and elsewhere use online business information to identify candidate companies for joint ventures and partnerships in new markets for clients expanding in new industries or new countries. Companies controlling their research and development through information save millions. Those that do not, waste their hard earned profits in pseudo-innovations. According to a survey by the German Patent Office, about 30 % of all research budgets every year are wasted on parallel developments. Almost 18 milliard marks are squandered on products and processes that are already patented. Companies using online-data to fine-tune their research increase the impact of their research programs by at least 30%.

Companies that use online-data have a significant advantage over the competition. Online-users identify more quickly new chances and new challenges. They perceive earlier newly opening markets and regions. They recognise earlier foreign competitors struggling to establish themselves, often successfully, in their home markets. Online-users are better informed also about developments in foreign markets. Through the timely prompts of their online-researchers they acquire new technologies, new markets, new customers and new suppliers faster and cheaper.

TECHNOLOGIES AND ATTITUDES

However, the critical factor to successfully tapping the world market information source is not technology but attitude. The successful researcher has learned not just the online commands. He has also learned to ask the right questions. However, today's challenge is not learning this command language or that command language, or even discovering the host with all the data bases for our particular field. Today's challenge is much simpler. In the face of the world market where so much information is available, we no longer suffer from ignorance but rather from disinformation. To overcome this problem we have to learn to ask the right questions. Otherwise, the information explosion will become as unmanageable for us as the EEC wine lakes and butter mountains, if less tangible but no less real. Our clients will suffer a disservice through disinformation if we cannot make sense for them out of the information explosion.

Through the use of such techniques as online databases, market research methods, and competitive intelligence techniques a creative and aggressive researcher can create management intelligence reports about supply and demand patterns, selling and purchasing trends, distribution channels, and potential replacement products and technologies. A competent researcher using modern retrieval and research techniques to probe the world market can forecast and report important technological, industrial, and market trends. However I wish to emphasize again, the critical success factor for research is not technology, (be it online, market research, or competitive intelligence techniques) but rather the right questions at hand. In the following examples, the information-gathering-technology has secondary importance.

ELEMENTS AND TRACES

To flourish a company needs only five elements: capital, labour, raw materials, production technology, and markets. However, all of these elements are constantly changing. Every change leaves traces of information. A company can have a lot of capital or a little capital. It can be self-financing, or be backed by banks, a partner or by stocks. The capital can be expensive or cheap. What does it mean to you when a competitor sells millions of dollars of bonds? Is he perhaps stocking up a war-chest to take you over? Or is he simply collecting money to double his capacity in your markets in North America?

A company can have a lot of personnel or just a little personnel. The personnel can be well qualified or poorly qualified. What do his hiring advertisements say about the kind of people he is looking for? What does it mean to you if the competition is advertising for french-speaking engineers who are willing to travel a lot?

A competitor can have modern or obsolete production technology. What does it mean to you if your competitor has just installed a new assembly line, and doubled his capacity? Where do you think he will sell his increased capacity? Whose norms and standards does his product comply with? Is his product cheaply or expensively priced? Is it modern or is it obsolete? Are there replacement technologies that already are patented, although they play no role in the market place? Why has the market ignored these new technologies? Are they too expensive, or are they badly marketed through the wrong distribution channels?

Is your market in a development phase, or is it already mature? Is price, performance or prestige the decisive buying factor? How quickly is the market progressing from the development phase to the mature phase?

All of these changes in the world market leave traces of information. And increasing numbers of these changes leaves traces of information in the press, in statistics and in databanks.

RESEARCHERS AND EXPERTS

Both in business and private life we need experts. If I'm suffering from a tennis elbow, I'll go to a sports doctor, he is an expert for such distress. If I want to sell tennis rackets, I'll sign up a Davis Cup champion for the endorsements. He is recognised by the buyer as an expert. If I want to make tennis rackets, I'll look for a man who understands something about Graphite-Fibre Compound Materials.

How does one recognise an expert? An expert is not someone who knows something, but rather someone who is known to know something. He has a high profile. High profile individuals are registered in databanks, they are quoted in the press, they publish dissertations, and they receive patents. Using databanks one can identify very quickly a relevant expert about a business, or a market, or a technology, whether he is in Milwaukee or in Lyon or in Milton Keynes. Once again, it is a question of asking the right questions. Do you need a marketing expert or a technology expert? Should the needed expert have written a dissertation on the market or technology you are researching? Should the expert have patented a device or a process? Has the expert been quoted in the popular or the trade press? Has he appeared in the new appointments column of the press? With what companies or what institutes has he been associated? Once a researcher has identified his expert he is ready to approach him, if he has briefed himself with the right questions. It's no use asking a technology expert about markets. However, most experts are proud of their knowledge and abilities. A few intelligent questions and the ability and willingness to actively listen often produce the opinions, statements, and prognoses that a researcher is seeking.

An effective market researcher uses a broad band of research methods, including online, documentation, and market research techniques, as well as a broad selection of information sources including internal and external databanks, directories, exhibition catalogues, company reports or company jubilee brochures, financial advertisements, job advertisements, Company House information, and statistics. Also traditional instruments of market research such as expert interviews, panel interviews and market research reports are relevant instruments for the aggressive researcher who wants to influence his organisation.

Over two decades ago, the canadian media expert Marshall McLuhan stated that future information technologies would shrink the world to the size of a global village.

About the same time, Andy Warhol prophesied that in the future every person in the world would be famous for 15 minutes. Online data communications are the technology that allows every item of information to be recallable everywhere, and the databanks insure that every person after his quarter-hour of glory will not sink into total forgottenness.

Using several patent databanks, at ADL we could identify new business opportunities in the conjunction of ceramics and sensors for a leading chemical company. Through the analysis of the patent activities we were able to identify the technology trends and the technology leaders. Using manual techniques the same research would have cost five times as much and taken five time as long.

EXPECTED AND UNEXPECTED

Information sources are often lie in unexpected areas. A few years ago some Fleet Street newspapers themselves published some press releases that they had bought some new presses with significantly increased capacity for four-colour printing. The signal to potential customers, competitors, and suppliers was clear : the newspapers were joining battle with the illustrated magazines for a larger and more valuable part of the coloured advertisement market. However, several months before, significant numbers of representatives of these newspapers appeared at specialist seminars about four-colour printing. Their participation at these seminars was an early warning signal of increased interest and investment in four-colour printing. For an aggressive researcher, online-data, press releases (unpublished as well as published) and also seminar participant lists are sources of competitive information. Look at your participant list from the ONLINE conference. Do you recognise any company names ? A competitor, for example? Think what could a competitor do with the information that you have learned here today.

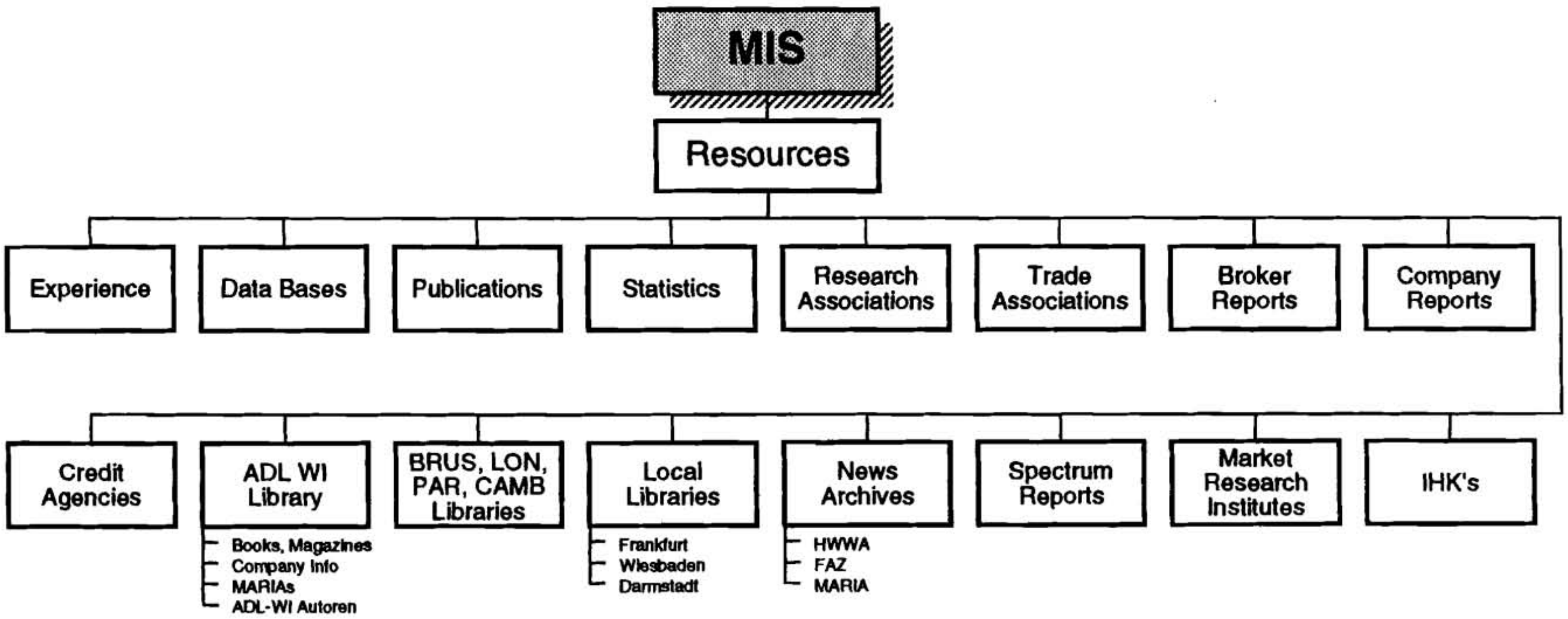
INFORMATION AND INFLUENCE

In the very near future the role, structure and methodology of the company information center will change radically. The changes are unavoidable since the methods of business decision-making have undergone a revolution. In the past, strategic business planning was an intuitive affair. Too often critical decision factors and decisive information were only found through chance. However, increasing professionalism and specialization have discredited traditional decision-making methods. Tomorrow's manager will base his decisions not just on the basis of experience, instinct, education and chance but rather on the new methods of strategic planning and on a much complexer information base than before. In many corporations, the company archive, exhibitions and the media are the only information sources for strategic planners. But we have left behind the stone age, the hunters and gatherers already are fossilized. The strategic planners expect more than a company archive that warehouses documents and occasionally answers a reference question. They expect an active, not reactive, strategic information service. The researcher who seeks the respect of top management as a professional, must master not only the online craft, but he must have also analytical and communicative abilities to understand the information needs of top management and to communicate in compressed, economical, and understandable form his research. His ambition must be to influence through information the decision-makers in his organisation.

Patrick /w 2

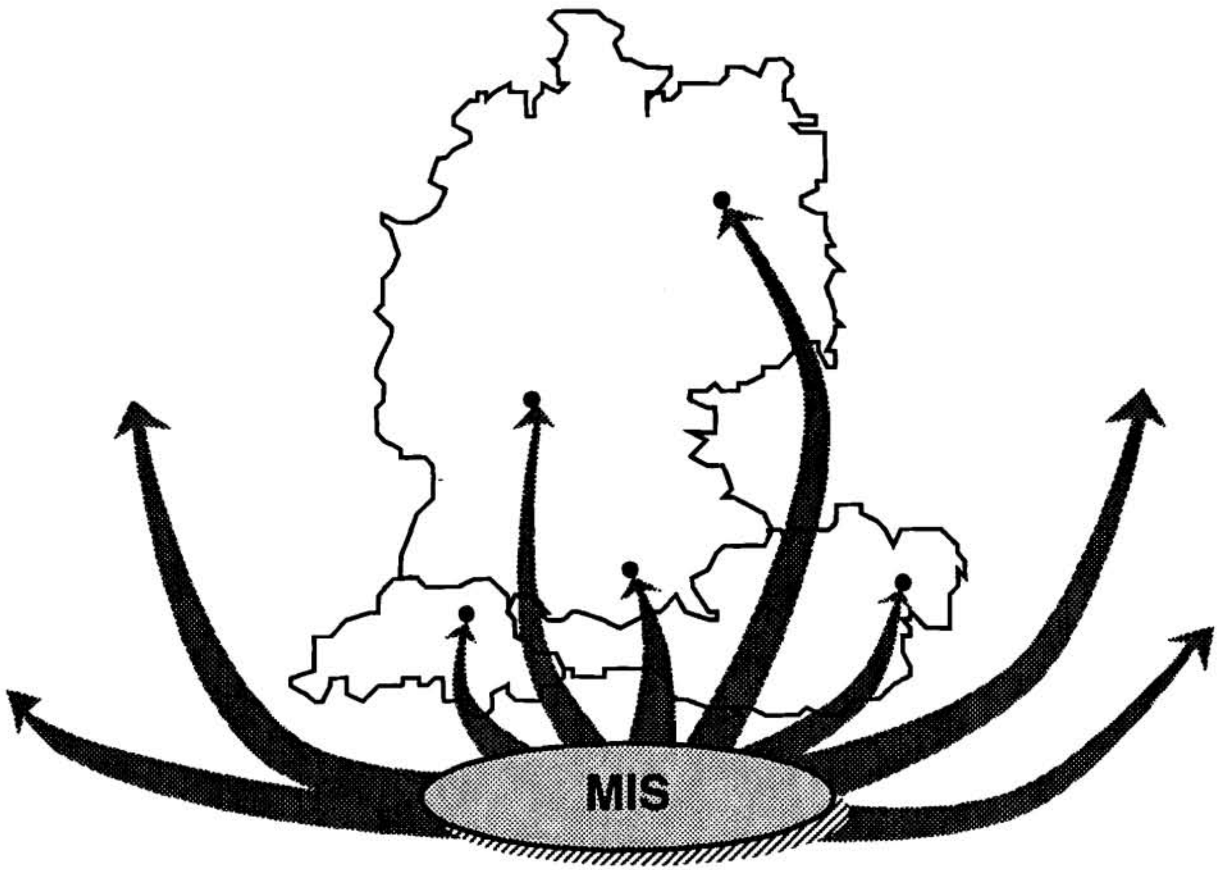
What is the Market Information Services?

➡ Market Information Services serves ADL's information needs through a concentration of services, skills and resources



Who uses MIS?

➡ ADL staff in Wiesbaden, Munich, Berlin, Vienna, Zürich and internationally



When to use MIS?

Sales Situation

- Who is the client?
- What are his strengths and weaknesses?
- What are his problems?
- Who are his competitors?
- Have we worked for the client or the competition?

Case Work

- Finding information about individual industry and technology segments and company information, issues and experts, key ratios, strategic analyses

Self Development

- Extending know-how about consulting, strategy, organisation, planning, controlling, PC's, logistics

Market Information Services

Patrick /w 8

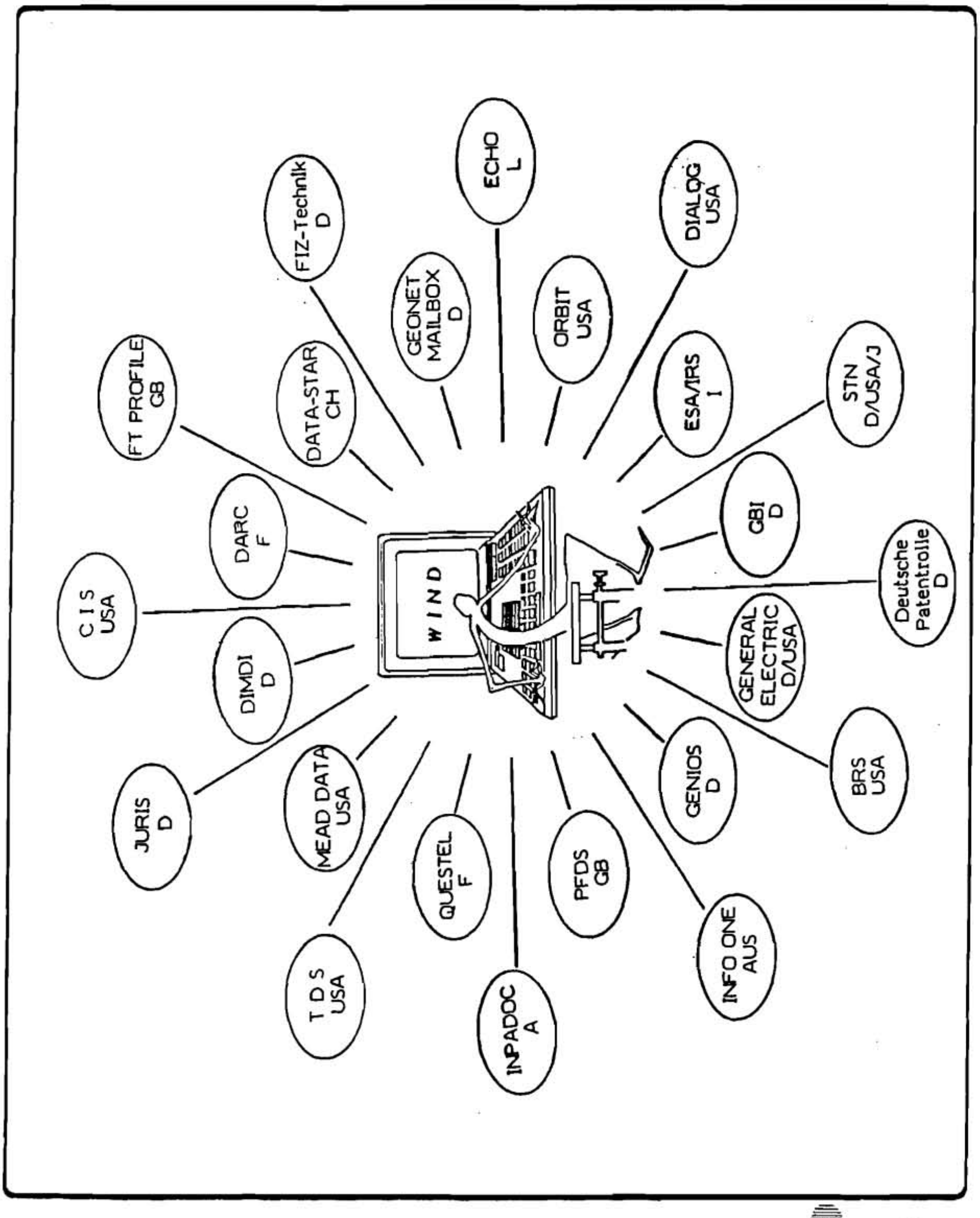
What kind of methods do we use?

- We are not economic spies
- We only use voluntary statements (Selbstauskünfte)
- But voluntary statements appear in diverse forms:

- Annual reports
- News reports
- Product catalogues
- Product directories
- Company directories
- Job advertisements
- Product advertisements
- Credit reports
- Broker reports
- Market research reports
- Interviews
- Questionnaires
- Building applications (Bauanträge)
- Chamber of Commerce registrations (Handelsregistereintragungen)
- Packaging
- Statistics
- Trade association reports
- Lobbyist reports
- Press releases
- Prognoses
- and own case reports and proposals

Portrait of the WIND GmbH

C. Wolff
Wissenschaftlicher Informationsdienst (WIND GmbH), Köln



WISSENSCHAFTLICHER INFORMATIONSDIENST KÖLN

Activities of WIND

Online Searches

Chemistry
Patents
Engineering
Medicine
Biotechnology
Environmental information
Business
Trademarks
Legal information

Document Delivery

Online Work Stations

Plan the individual requirements
Optimizing
Hardware
Software
Contract service with hosts & Telekom

Training

Databases
Retrieval
Communication software
Inhouse retrieval
Word processing for onliners

WISSENSCHAFTLICHER INFORMATIONSDIENST KÖLN

Cooperation

a well-established concept
between information broker and
industrial information departments

T I C

Technical Information Center

internal information broker	external information broker

Departments for marketing, R & D, sales, patents ..

Customers

Online Searches

	1992	1989
Industry	75 %	25 %
Service industry*	15 %	30 %
SME	7 %	35 %
Authorities	1 %	3 %
other	2 %	7 %

* patent attornies, consultants, engineer's offices, physicians

Turnover

Year	Online Search	Training	Consulting	Hard-/Software	other
1990	43 %	19 %	11 %	18 %	9 %
1991	50 %	20 %	13 %	5 %	12 %
1992	34* %	34 %	16 %	10 %	6 %

* new contracts with customer's passwords

Subjects

Online Searches

	1992	1989
Natural Sciences/Medicine	25 %	30 %
Patents, Trademarks	40 %	40 %
Business Information	20 %	12 %
Engineering	15 %	18 %

Average Duration
of WIND Online Searches

Connect Time per Contract	50 minutes
Online Sessions per Contract	7
Connect Time per Session	4,3 minutes
Working Time per Contract	3 hours

Information Management in a Private Company

R.H. Meyer
Bayer AG, Leverkusen

1. Introduction

Thank you for inviting me to the WINRE 1993. Before I start to talk about *Information Management*, I would like to introduce myself. My name is Rudolf H. Meyer. I am employed by *Bayer AG*, where I am the Manager of the »*Competitor Analyses and Information Services*« Department.

My remarks will be directed to the four following topics:

- Information Management as part of the Bayer organization
- Responsibilities of the Information Management Group
- "Philosophy« of the Department
- Trends and Implications

2. Information Management as Part of the Bayer Organization

The »*Competitor Analyses and Information Services*« Department, that I manage, is part of the »*Corporate Market Research & Business Information*« Department, which is one of several organizational units of »*Corporate Planning*«. »*Corporate Planning*«, in turn, is one of the main organizational units of the »*Corporate Staff Division*« of *Bayer AG*.

Next, I would like to show you how my department is positioned within the »*Corporate Market Research & Business Information*« Department (see Chart 1). The »*Corporate Market Research & Business Information*« Department is comprised of some 30 people, 20 of whom are professionals with academic degrees. As you can see, this department is not the only group of market researchers within the company. There are also market researchers in each of the business groups or divisions as well as in our major subsidiaries abroad.

»**Information Management**«, the way we understand that term, is the responsibility of three groups within my department:

- Business Data Bases/Electronic Files/Library
- MR Consultants (Outsourcing)
- Central Business Information System (ZWIS)

By the way: When we discuss »*Information Management*« in my area of responsibility, we are only talking about **Business Information**. Scientific and Technical Information Management is incorporated into the »*Corporate Research & Development*« Service Division.

4. Responsibilities of the Information Management Group

Business Data Bases/Electronic Files/Library (For responsibilities, see also Chart 2)

- ■ **Information Sources Management**

  Our *Information Management* professionals offer a range of information sources that can be researched directly by Bayer employees, be it Marketing, Production or Purchasing personnel in need of business information. This portfolio of information sources is comprised of

  - a **paper clipping service** that now is being replaced by an **electronic archive**, named **CWD**.
  - CWD is an imaging system which will include OCR - software as an additional feature over the next couple of months.
  - a **library**.
  - some **data bases on CD-ROM**, but only a few.
  - the **»Bayer Market Research Index«**, a reference data base that contains reference information regarding all market research studies that have either been done in-house or have been purchased from outside consultants. This data base is related to our **archives of market research reports**, which are hard copies and are not electronically stored. These can be signed out be Bayer employees.

- ■ **Carrying out Short Requests by searching information sources**

  In the area of activity given above internal customers search those information sources themselves. They can also request two research professionals to search the vast assortment of **online data bases** in addition to the above mentioned sources. Internal customers do not normally research the online data bases.

MR Consultants (Outsourcing) Responsibilities see Chart 2.

Central Business Information System (ZWIS) Responsibilities see Chart 2.

5. »Philosophy« of the Department

While in the previous topic I explained the responsibilities of our *Information Management*, I would now like to characterize the guidelines along which these activities are to be performed.

Chart 3

The »Value Added« of *Information Management*/Market Research with Respect to the Complexity of Clients' Information Needs

- On the low end:
  Offering information sources to internal clients who will research these sources themselves.This has a low »**value added**«.
- Carrying out research requests and either handing over the information retrieved »as is« without any further processing or, upon request, process the information and sum it up in tables or graphs.
- Carrying out research requests thru research personnel. The information retrieved will then be analyzed by a market research professional who will write an executive summary on the findings.
- On the high end:
  Conducting a full fledged market research study involving desk as well as field research, analyzing and evaluating the information collected and coming up with implications and recommendations as to what decision should be made or what action should be taken. This has a high »**value added**«.

The first two categories of activities we call »*Information Management*«. Market Research on the high end we characterize as »*Inhouse Consulting*«.

I will emphasize two aspects:

First, the »***Corporate Market Research & Business Information***« Department is a full-range supplier of market research services: Refering to the »**value added**« of *Information Management*/market research with respect to the complexity of clients' information needs, these services span between two ends (see Chart 3).

Second, the »***Corporate Market Research & Business Information***« Department and subsequently our *Information Management* look upon themselves as being in the position of a *market research institute* that:

- should work for internal customers who are in such urgent a need of business information that they are willing to spend money in order to get that information. Therefore, we backcharge most of our services to our internal customers.
- must be positioned to satisfy the information needs of our customers in a better way than any inside our outside competitor.

There, we think we do a good job. It is our strong belief that, e.g., as far as researching online databases is concerned, if we do not uncover the information needed, it is not there.

6. Trends and Implications

Finally, I would like to point out some of the underlying trends and implications resulting from the issues that I have been talking about.

Mostly because of the objective that in the long run, to secure the position of the »*Corporate Market Research & Business Information*« Department and of the *Information Management*, respectively, we will strive to increase our turnover from backcharging our services and also to be very cost conscious, and we foresee the following trends:

- More and more of the information gathered from secondary information sources stems from electronically stored data. It is not only because you can process the data much better in terms of, e.g., word processing or spread sheets. It is to a significant part because you can implement a software program that will help you to monitor and record who has gotten how much information. Thus, you can accurately backcharge the cost of information to the user. Our library and the paper clipping archives will lose importance since we do not backcharge those services.
- The usage of online data bases will increase further as compared to other categories of information sources mentioned before, because more and more information is going to be available through online data bases.
  At present, already 70 % of all information retrieved from secondary information sources, when carrying out research requests, stems from online data bases.
- When backcharging, data bases on CD-ROM will stay unimportant, as long as the current pricing policy of CD-ROM vendors prevails.
  In researching online data bases, your cost is on a pay-as-you-go basis. If you subsribe to a data base on CD-ROM, normally you pay a lump sum per year, upfront, mostly out of your own budget. After that, usage is unlimited and no additional cost is incurred.
  For one thing, demand for information increases, but this information has to be taken from an ever increasing number of data bases. The money spent on a particular data base does not increase. Therefore, we never reach the break-even-point in an online vs. CD-ROM database comparison where it would pay to abandon the online data base in favor of a data base on CD-ROM.

In addition to that, due to the differences in pricing policies, the cost of online data bases can be backcharged easily while customers question the backcharging of CD-ROM data base costs since those have already been paid. Therefore, we have almost no data bases on CD-ROM.

- To increase our turnover in terms of cost being backcharged, we try hard to widen the share of services requested and paid for by our internal clients that are on the high end of the »**value added**« chain as discussed previously. In doing so, we are gradually getting out of the mere *Information Management* sphere and onto the *consulting* level.

A new policy derived from these trends and implications has come into effect a year ago. Following these new guidelines, within one year we have managed to more than double our turnover.

Thank you very much for your attention!

Imformation Management in the Private Sector of the Bulgarian Economy

B. Dorbrev
Bulgarian Information Industry Association, Sofia

The private sector of the Bulgarian economy should be considered as a part of the big changes in the society and economy which happened during the last 3-4 years. The society achieved a peacefull establishment of a democracy - new political structures has been formed, free elections has been performed, a high spirit for innovations appeared at almost each part of the society. A lot of hopes, but also many disappointments arise. Than increasing unemployment and inflation (still under control) are disturbing a lot of people.

The economy is definitelly on the way to market-oriented economy. The whole banking and financial system were re-built, privatization is starting, a big part of the land is returned to the previous owners, the number of new private shops and restaurants is enormous and is increasing every day. But at the same time production is still decreasing, there are big foreign debts, many old structures are destroyed and the new are not full established. There is not a modern business infrastructure, the links between the Eastern European countries were destroyed and in addition there are very big losses due to the UN embargo for former Jugoslavia.

Never mind the existing problems the changes in the society and economy led to a rapid development of private firms. From more than 200 000 registered firms, about 85% are in the private sector. The structure of the private sector shows, that 30-35% are with limited liability and about 60% are firms of sole propietors - "one man firms". In the same time 94-95% from the firms involved in production are state-owned.

The firms that are being registered are mainly oriented to catering and trade rather than to production of goods. This tendency is still dominant. Many firms have curbed there activity because they lack good and reliable information and competent planing. They are looking forward to a better marking price-formation.

Its a rule that small firms - most private firms fall into this category - start their business without the necessary preliminary study to the market and without close and reliable international contacts. In most cases they are not in a position to maintain market departments or else they seldom seek the help of specialized marketing companies.

More than 61% of the Bulgarian Firms that have been investigated are oriented to trading with non-durable goods, mainly from the food, wine and tobacco industries. More than 10% of the firms are opening enterprises closely connected with the manufacturing of foodstuffs - dairies, sausage-making butchers and baker shops. Few companies are really interested in the development of farming and tourism mainly because of the high interest rate and difficult bank crediting. These branches are the chief concern of state-owned companies and joint ventures which take on themselves the financial and investment risks.

The interest of a large number of private companies in the development of ecological industries, such as processing waste water and products, alternative sources of energy, etc. is steadily growing.

There is a steady tendency towards looking for foreign representation in Bulgaria and launching joint ventures with foreign participation. Most Bulgarian firms can offer high professionalism and good contacts with the markets in Central and Eastern Europe, mainly with the Russian market.

More than 22% of the companies want to establish contacts with foreign producers and dealers.

Information is an important factor for the development of private business in Bulgaria. This is recognized by more and more private firms. A survey with more than 10 000 Bulgarian firms shows that for the time being the most information which they need is:

about: 22.5% - Direct contacts with other firms

20.5% - Investments and Investors

18% - Export regulations

15.5% - Import regulations

15.5% - Joint ventures

8.3% - Terms of branches registration

The expected information requirements of the private business will promote the Information Management in the private sector.

But Information Management in the private sector is depending on the state of the art and development of the

Information Industry, the Information Infrastructure and the Information Services Market in the country.

The Bulgarian Information Industry could be characterized by:

- More than 25 years experience in EDP
- More than 100 Computer Centers, including 28 Regional Computer Centers, IBM Main frames equipped and several hundreds PC's are attached to them
- Well developed software development by public and private firms
- Wide PC's implementations and PC's software applications (including a large number of office systems)
- Very good qualified DP professionals
- Two big hardware producers (for PC's and magnetic disk drives)
-.More than 1 000 companies involved in information service

The existing Informations structure is geared towards the needs of the state, not towards the free market economy.

Although there is a relative good background concerning EDP, hardware and software equipment and experience in information processing. Due to the central planned economy for many years only the science-technical information had been promoted and statistical data bases had been developed. The communication infrastructure is unsufficient. The market oriented economy is changing the role of the information and the first business data bases and business information services had taken place. Also the number of small private companies in the information industry is increasing.

What about the Information Market?

As in other branches a market for information products and services should be established. Many years there were dissemination, implementation, but not realy sales of products and services. Traditional services like data processing, MIS and software development, office automation have been planned and performed more due to central decisions and only in few cases due to the realy demand and needs of the clients. It didn't exist marketing, price estimation and quality control of the information products and services.

Now a lot of things have changed. There are several groups of clients - government authorities, municipalities, banks, public and private companies, research institutes and universities, citizens. Each client decides by himself what kind of products and services he needs and how much money he could spent for that.

There are a lot of companies providing information products and services. Government owned companies have to earn their profit on the market (only the nominal capital is from the state) in competition with other companies. As a rule public companies have a lot of resources and potential, a big share of the expected market, but are less flexible and innovative. The new established private companies involved in software development and information services are relative small, but very innovative. They usually provide one or two good products, but they do not have the infrastructure for it's distribution in the country.

As a result of a lot efforts in the last decades there exist a relative sufficient amount of hardware and software in the various users in Bulgaria. The problem is to improve their effective usage but the estimation is that software and hardware market will be limited in the next years.

There is a good market for information products and services, management consulting and training. Business and marketing information, product prices about domestic and foreign companies are requested and financial, banking and stock exchange information will follow. And bulgarian managers do not need only information, but also knowledge how to deal with it, so that management consulting has good chances. Prices for information products and services are different, but they are now market oriented and lower than in Western Europe.

Problems which should be solved in order to establish the information market and to provide better opportunities for information producers are:

- to learn the users how to use information for manager decision making
- to learn how to perform marketing and saling of information
- to improve the user interface and the quality of user manuals
- to establish data protection and privacy rules
- to develope intensive links to international data bases and organizations.

Important considerations which should be taken in account by information products marketing in Bulgaria are:

- There is a need not only to offer information products but also knowledge how to use it (management consulting, training etc.)

- Managers have to learn the value of business information and therefore a direct contact is recommended (marketing by phone, fax or mail did not brought optimistic results)

The information products and services market has to be established and developed with common efforts of information producers and information brokers representing domestic public and private companies and with cooperation with foreign international organizations and companies in the information industry.

An important role in this process will play the Information Management in the Private Sector of the economy. The private sector should be considered as an user of information products and services. but also as producer and provider of Information.

All above mentioned considerations about the Information Industry and the Information Market define the scope and the problems of the Information Management in the private sector. Following the tasks of IM the conclusions would be as follows:

- Hardware is available - mostly PC's (386, 486)
- There is a lot of Application Business Software
- Communication facilities are bad. The most private firms are using INFOTEL / a public network, similar to Bild-

schirmtext)

- Private companies had implemented Office Systems, Accounting Systems and few Marketing IS or Management IS. A lot of information technologies were installed in the banks.

- Private firms explore as a rule small data bases, or are operating as distributors

- Personnel - most of the best computer and software professionals had moved in the private sector. A problem still are the unsufficient Management skills of a part of the firms owners and managers.

With the increasing the number of private firms as a result of the privatization and due to the lessons (some times not very pleasant) of the market, I do believe that Information Mangement in the private sector will grow up in the next years. The reasons for this optimistic forecast are based on the expectations for the development of the entire environment of the Information Management, which are:

- Increasing the speed of the economic reforms and as result an increasing private sector. This would mean:

- Increasing information needs for the objectives of company management, marketing, banking, stock-exchange, investments, international cooperation

- Private firm owners and managers will recognize the role and the power of information as a strategic resource and a key success factor in business

- The privatization of a part of the information infrastructure will permit a better usage of it's capabilities

- Increasing the number of business data bases and the access possibilities to international data bases

- Development and implementation of MIS, DSS and Executive IS in the private companies

- There is a good knowledge and experience of development and usage information technologies

Only with the joint efforts of the private and the public sector, strong supported by the government and using the full scope of the permanent increasing information needs and initiatives of the private firms and the information and communication infrastructure, which is and will stay for a certain period of time mostly in the public sector, Information management could bring the expected benefits to the private sector and to the whole Information Industry. This is one of the main goals of the Bulgarian Information Industry Association (BIIA) to promote the cooperation between the private and public sector in the field of information technologies and services. BIIA was established in 1990, restructured in 1992 and has now 50 members - companies and individuals, involved in producing and providing information products, services and related software, training and consulting. The priority tasks for promoting the Information Management development, recommended by BIIA are:

- Improving the communication infrastructure
- Developing business data bases on national and regional level
- Establishing the legal base - an Information Protection Law, Copyright etc.
- Implementing the European information standards
- Intensive training of Managers, Information producers and providers
- Marketing information products and services

- Developing Information brokers

- Cooperation between public and private sector

- Cooperation with other European Information producers and International organisations

Session V

Information Management in Authorities

Chairman: H.-P. Butz

The Example Deutscher Bundestag

S. Orti von Havranek
Deutscher Bundestag - Verwaltung Referat Datenbanken, Programmentwicklung (ZI 5), Bonn

Legislatives are not only producing a considerable amount of Information but are at the same time important consumers of information. The German federal Parliament - Deutscher Bundestag - has evolved over a long time sophisticated means of gathering information for its Members.

The information is provided not only by traditional means like books but also by using electronic media. Like other legislatures the Bundestag has got a library, an in-house documentation, an archive, a press documentation etc.

But there is at present no real integration of these services. The internal documentation of the parliamentary processes can be accessed by the Members directly using their PC and the internal X.25-network. The library started a machine readable catalogue in 1987 but unfortunately this information is not available online yet. There are plans to made it available soon. Last year, in autumn 1992, an internal database containing a seven day period of press agency material has been made available to the Members and an internal X.400 message handling system is under preparation. The archive and the press documentation work still in the conventional way.

External databases are used as well. The Bundestag started in the early 1970s using the database of the Press and Information Office of the federal government and the juridical information system JURIS at that time being developed by the federal Ministry of Justice. These systems were followed by the CELEX database of the Commission on the European Communities and later bycommercial hosts.

The online searches were made by one employee at the EDP department of the administration of the Bundestag. This service was well accepted and heavily used by the Members, their staff and the staff of the parliamentary parties as well.

In the early 1980s the Members began to feel dissatisfied regarding their technical support in performing their legislative tasks and in fulfilling their duty to control the government efficiently. As a result a project called PARLAKOM was started. This project had the objective not only to provide the Members with modern office equipment like telefax and PC but as well making the access to electronic information easier. In this context three models of using external databases were discussed.

The first was the direct individual access by the Members and their staff. This direct access was considered to be too cost-intensive and too difficult due to the complex retrieval systems and the numerous different databases. So only a small group of deputies engaged in the preliminary project were granted a limited access to external online systems. By today only some four or five are still using external databases by themselves.

The second model was a centralized solution. A team of searchers in a kind of open-plan office should do the searches for all persons entitled to receive databases information. As the Members are sited in about ten different buildings this solution was soon found not to be adequate.

As none of both concepts was considered to be adequate the administration adopted a different model. In october 1987 four decentralized retrieval points were set up close to the Members' offices in two of the buildings. The offices are runned by professional information brokers who are part of the parliamentary staff.

Apart from the direct requirements of the Members there is also a considerable demand for information from the Parliaments Research Services. As a consequence in 1989 a further database information office was installed in the new building occupied that time by the Research Services. Since autumn 1990 it has also been possible on one afternoon per week to obtain statistical data via the STATISBUND information system from a member of staff of the Federal Office of Statistics. This facility is also made considerable use of by the Research Services.

A further office has been opened early this summer in a third building occupied by Members of the Bundestag.

An information counter is as well installed in the lobby of the new plenary hall. So the Members have the possibility of passing on small demands to be dealt with immediately or more extensive search requests for processing later in one of the database retrieval points. The counter is staffed by the employees from the existing database retrieval offices.

The database retrieval service is formed by a staff of seven searchers, one of them as a senior position. The searchers all are documentation or library specialists. Due to the wide range of subjects which are searched for parliamentary purposes there has been taken the decision not to specialise on specific subjects or hosts but to operate as generalist information brokers. So a searcher will look for medical information in the morning, then search for economic or financial data and conclude the working day trying to find juridical information.

At present there are agreements with some 15 different hosts offering access to well over one thousand databases throughout the world. Amongst these hosts are both major suppliers as Dialog offering some four hundred files and specialists such as the Stiftung Wissenschaft und Politik which coordinates a network of documentation centers in the area of international relation and area studies and offers to the Bundestag direct access to its database which is also accessible via ESA-IRS.

It will be clear that not all of the databases are used with the same frequency and that there are even a lot of databases which will never be used like those offering structural searching in chemistry.

To tell Members which databases are available for consultation there is a small guide to databases containing detailed information on around one hundred of the most frequently used databases. In addition Members receive a leaflet giving notification of the information available from databases and the other information ressources in Parliament.

The progress in the number of database consultations since 1987 when the decentralized model started to work shows how well this service has been accepted. In the last years there has been an increase in demand of some fifteen to thirty percent per year. Despite this greater utilization there have been up to now no sacrifices in terms of quality, thanks to the growing experience and the ongoing training measures. A future increase at the same rate would probably result in a deterioration in quality which must be avoided.

Based on present figures, staffing may be planned on the basis of one retrieval point for sixty to seventy Members, making a total of ten to eleven retrieval points.

In view of the experience gained in the last six years, this service will also be included in the plans for the new buildings in Berlin. To facilitate manning and to enable researchers to consult with one another, it is suggested that retrieval offices should be installed in pairs.

The database retrieval service close to the Members' offices and to the Research Services have demonstrated thier utility in practice. The information they provide has become an essential component of day-to-day parliamentary business. An appropiate extension of the service is required in order to provide all Members with facilities which are adequate in terms both of quantity and quality.

Information Management in the Federal Office for Radiation Protection - The BfS Wide Area Network as Base of IT Operation -

D. Meyer, F. Piefke
Federal Office for Radiation Protection, Salzgitter

Abstract

As in many other public offices and institutions, the use of personal computers for many different applications has steadily increased during the past few years also in the Federal Office for Radiation Protection (BfS). In time, the need to combine the numerous isolated PC workplaces into a network became increasingly stronger. In the middle of 1991, when the project "BfS network" was initiated, the BfS could look back already on a BANYAN-VINES network operating in the Braunschweig office since 1988. The overall experience from a local BANYAN VINES network and 15 workplace computers over a period of three years was positive. By the middle of 1992, about 185 workplace computers were connected by the net at the fife sites, and about 275 co-workers were active users of the BfS network. Access to external data banks or institutions such as STN in Karlsruhe, DIMDI and JURIS via the network software, an aspect of extreme importance to the BfS, is also possible from each connected workplace.

1. Starting situation

As in many other public offices and institutions, the use of personal computers for many different applications has steadily increased during the past few years also in the Federal Office for Radiation Protection (BfS). The usual standard programs, as for word processing, spreadsheet calculations, simple computer graphic programs and many other programs are performed by personal computers. At the time of its foundation on 1 November, 1989, the Federal Office for Radiation Protection had neither the capacity for large computers nor for a computer centre, so that with the exception of some problems for which external computer centres were and are being used, such compute-bound and storage space-intensive applications were carried out with the more and more efficiently operating PCs.

In time, the need to combine the numerous isolated PC workplaces into a network became increasingly stronger. Therefore, the Federal Office for Radiation Protection started the network project in its central office at Salzgitter during mid-1991. For its administrative and predominantly scientific tasks, and apart from threee smaller workstations, the Federal Office was provided with about 235 MS-DOS PCs (meanwhile about 400 are available). Nearly all of them were isolated individual workplace systems and, additionally, distributed nationwide over ten sites. The Braunschweig office operated with only a small local BANYAN-VINES net of about 15 connected workplace computers.

When extensive documents had to be prepared by different BfS co-workers, the harmonization processes were rather time-consuming. The documents prepared by several authors in different offices had to be sent by house-internal mail or telefax to the central office in Salzgitter for review and possible amendments, and then be again returned - a very circomstantial procedure.

Without a network, the growing need of BfS to communicate with external computers and information systems would have resulted in a variety of isolated "communication islands". Besides this, the software maintenance of the individual PC workplaces was very time-consuming in practice. Every newly released program had to be installed to fit each individual PC.

This was no permanent solution for the extensive tasks of the Federal Office for Radiation Protection, which furthermore continuously increased during the developmental stage. Under the authority of the Federal Minister for the Environment, Nature Conservation and Reactor Safety (BMU), the Federal Office includes such special departments as:

- Radiation Hygiene
- Radiation Protection
- Nuclear Safety
- Nuclear Waste Management and Transport, and the
- Central Department.

The Federal Office for Radiation Protection is engaged, among others, in federal tasks according to the Precautionary Radiation Protection Act and carries out independent scientific and research projects in the field of radiation protection. Most of the 576 BfS employees are engaged in these fields. In brief some random examples of future or current projects, which reflect high requirement of information technology within the BfS are:

- calculations within the framework of safety analyses for planned radioactive waste deposits
- registration and documentation of notifiable events in nuclear installations
- shielding- and criticality calculations for containers with radioactive material
- calculation of age-dependent dose coefficients at internal and external radiation exposure
- data banks for radon measurements to estimate the regional and time distribution of radon concentration in dwellings.

2. Installation and operation of the BfS network

In view of these tasks, the "BfS network" project has been started two years ago. An efficient site-interconnecting communication system is required to integrate the available single workplace systems which remains open for the integration of further computer systems. Additionally, this system should enable or integrate all essential functions of administrative communication, such as

- electronic mail
- word processing
- spreadsheet calculations
- use of graphics
- use of data banks - particularly ORACLE, the standard BfS data bank system for major applications, and
- communication with external computers.

In the middle of 1991, when the project "BfS network" was initiated, the BfS could look back already on a BANYAN-VINES network operating in the Braunschweig office since 1988; this was in a department of the Physikalisch Technische Bundesanstalt (Federal Institute of Physics and Metrology), now integrated into BfS. The overall experience from a local BANYAN VINES network and 15 workplace computers over a period of three years was positive.

Besides such practical experience from a longer period of operation, the following reasons were decisive for the choice of the BANYAN VINES system:

- simple, clear and efficient administration, both in LAN and in WAN
- good function and scaling ability for an administrative-wide network
- flexible communication capability with external computer systems
- use of complex application systems.

After BANYAN VINES was selected for a BfS-wide network system, the installation of the local network was started, in autumn of 1991, at the following sites:

- Berlin-Karlshorst
- Freiburg
- Neuherberg near Munich, and
- Salzgitter-Immendorf.

Six months after the initiation of the "BfS network" project, these four offices including 70% of all workers, were integrated into the BfS network. In summer 1992 the LAN already installed at the Braunschweig site by a prior institution to BfS, was extended and integrated into the existing BfS network. This includes, except from Salzgitter-Lebenstedt, all essential sites with about 85% of all workers.

By the middle of 1992, about 185 workplace computers were connected by the net at the fife sites, and about 275 co-workers were active users of the BfS network.

As next step, the available servers were removed in order to integrate more workplace computers and users into the existing BfS network. Furthermore, the technical prerequisites had to be created to achieve the planned data bank applications under ORACLE, so that data sets could be processed that need both a higher server performance and a larger disk storage capacity.

The three servers in Berlin, Munich and Salzgitter were then replaced by the COMPAQ SystemPro/XL Server, with a 2 GB disc capacity each. All three servers were configurated identically. In addition, a fourth server of the same configuration was provided as maintenance server situated in Salzgitter-Immendorf. In case of a server breakdown, the maintenance server may start operation within a short time at any BfS site.

The office in Freiburg was equipped with a COMPAQ SystemPro 486 and a disc capacity of 840 MB. The other available COMPAQ-SystemPro 486 is intended for the office in Bonn, which will shortly be integrated into the BfS network; altogether 351 users will then work within the BfS network.

3. Software in the BfS Network

On all servers in the local network the BANYAN VINES network operation system is installed with an unlimited user number. Besides the software for MAIL, effecting the electronic mail, on all servers MNET is installed for the network management, and particularly also PCDIALIN, a software which enables the access the BANYAN network from an external PC over a modem at a traditional telephone connection.

Additionally installed at the central communication server in Salzgitter-Immendorf are:

- IBM 3270/SNA software for communication with IBM computers (e.g. to IBM systems at the GRS in Garching and to the Bundesamt für Finanzen (Federal Office for Inland Revenue)), and the
- BANYAN X.25/X29 Option and BANYAN Asynchrone Terminal Emulation for communication with external computers via Datex P and Telephone Modem.

The workplace computers are running the operating systems MS-DOS and MS Windows for Windows-dependent applications and the standard software Word, Word for Windows, Excel, Harvard Graphics, dBase for smaller data bank applications and many others. The aim is to keep and maintain all workplace computer software on the local servers, except MS-DOS and individual applications.

4. Use of external data bases by the BfS

Access to external data banks or institutions such as STN in Karlsruhe, DIMDI, JURIS, DBE and UBA via the network software, an aspect of extreme importance to the BfS, is also possible from each connected workplace.

Access is possible to the following external data banks or institutions:

- STN (Fachinformationszentrum Karlsruhe (Special Information Centre Karlsruhe))
- JURIS
- Data bank of Environmental Law at the Umweltbundesamt, UBA (Federal Environmental Agency))
- NEA data bank
- GRS emergency data banks VIBS and BEVOR
- in preparation: EC data bank system ECHO
- DIMDI
- DBE (document administration system).

The latter are described in detail as follows:

STN

Via the Fachinformationszentrum Karlsruhe information can be retrieved from more than 150 data banks on all aspects of research in exact science and technology, as well as identification data of material, and biomedical information. From this data bank system, the data bank INIS with information on nuclear technology is predominantly used at 77% by BfS. Since the use of FIZ in Karlsruhe, in July 1992, about 7-10 inquiries have been performed per month, with rising tendency. At every BfS site one co-worker has access to the FIZ Karlsruhe and is available for data bank inquiries to his colleagues.

JURIS

JURIS is a data bank system containing information on jurisdiction, legal literature and legal rules. It is frequently used since August 1992.

Data bank on environmental law at the UBA

The environmental data bank of the Umweltbundesamt can be used since May 1993 and provides information on general information of environmental law.

NEA

The Nuclear Energy Agency of the OECD offers a data bank system from which can be retrieved computer programs and data on nuclear research. As of October 1993, BfS workers have access to this data bank.

GRS

As of 1 January 1993, the physically available data banks on abnormal occurrences BEVOR (German nuclear power plants) and VIBS (nuclear fuel cycle centres) are registered. In BEVOR are registered about 200 abnormal occurrences, and about 60 per year in VIBS. During the coming year these data banks shall be kept by BfS under its own responsibility and its own systems.

ECHO

The use of the EC-host service is in preparation. Via the EC-host service about 20 data banks are going to be accessible. The access will be established before the end of 1993. Of particular current interest is the CORDIS data bank which is containing information on the F + E projects of EC.

DIMDI

The Deutsches Institut für Medizinische Dokumentation und Information (German Institute for Medical Documentation and Information) here in Cologne is offering various data banks from the health and medical services that are of particular interest to BfS co-workers at the Institute for Radiation Hygiene in Neuherberg.

DBE

The Deutsche Gesellschaft zum Bau und Betrieb von Endlagern für Abfallstoffe mbH, DBE (German Society for the Construction and Operation of Waste Depositories) has developed a data bank for processing significant background material on the licensing procedures of the proposed depositories Konrad and Gorleben. Originally, the data were processed parallel at DBE and BfS with the aid of a programmed application under dbase. DBE has meanwhile introduced a new development under ORACLE which BfS intends to use.

The trend towards an increased use of external data banks as an actual, rapid and efficient source of information will also in future be followed at BfS. The long range plan is to make data banks directly accessible to each interested co-worker via the BfS network. To accomplish this, it is of course necessary to know how to conduct the inquiry and to be in the possession of expert research background.

5. Extension of the BfS network

A SYSTEMPRO/XL server to use BANYAN in the operating system SCO-UNIX is currently prepared for integration into the local network in Salzgitter. This server is to fulfil the following tasks:

- communication computer for external computer connections as access route to the worldwide internet
- communication computer for the BfS-internal computer system
- ORACLE data bank application under UNIX

- use of further UNIX applications.

In this context, three UNIX workstations that are currently still in separate use, will be integrated into the BfS network above PC level and be available for each BfS workplace with network access. For this purpose, the operation of the following software components is presently in preparation:

- VINES for SCO UNIX version 1.0
- VINES TCP/IP routing
- VINES PC/TCP
- SMTP mail gateway, and
- ORACLE in version 7 for SCO-UNIX.

6. Summary report of experience

In summary, the experience gained from the BANYAN VINES network since its practical operation was started during the end of 1991 is very positive. All requirements were met, particularly in reference to the following subjects:

- The administration both in LAN and WAN is simple, effective and economic.
- The availability of the server hardware and software is very high and is nearly 100%.
- The functions available to the user, especially the Mail function, are very effective. Due to the distribution of the BfS over 10 sites, the status of the Mail in the daily administrative communication between the individual offices is very high. Most different documents such as reports, endorsements and communications are exchanged by mail between the offices, whereby the information processing has been highly improved.
- The user interface is simple, application-oriented and convenient to operate.
- The software PCDIALIN to gain access to the BANYAN network from an external PC via telephone modem is stable and effective and therefore frequently used.
- The software BANYAN-X.25/X.29-Option and BANYAN Asynchrone Terminal Emulation used to communicate with external computers is very effective and is currently used in the USA with five German computer systems in all (JURIS, DIMDI, STN, UBA, and DBE) and one foreign computer system (DIALCOM).
- The 3270/SNA software is stable and is currently used to communicate with an IBM computer at the Gesellschaft für Reaktorsicherheit, GRS (Society for Reactor Safety) in Garching near Munich and an IBM computer at the Bundesamt für Finanzen in Bonn in daily operation.

7. Development of application systems at BfS

During the current and the coming year, the BfS has to accomplish several DV projects for different sections on the hardware and software basis of systems integrated into the BANYAN network. In most cases, this involves data bank applications under the ORACLE system, which is the BfS standard for major data bank applications. The most important of these are:

- Radiation protection register
- scientific and administrative support of research projects
- data banks in the Nuclear Safety Department.

The staff capacity in the information technology section of the BfS being very low, it is not possible to develop own applications. As an alternative to own programming work remains the allocation to external companies. Therefore, in all three cases mentioned above, companies were commissioned with the development of the data processing concept, with software development, with software introduction and training of the BfS staff, and with the performance of the software service. The companies follow a BfS concept for the development of the application system including, among others, the use of ORACLE*CASE for the entire development process. The BfS staff that will later use these systems, is involved in the development from the beginning.

8. Figures

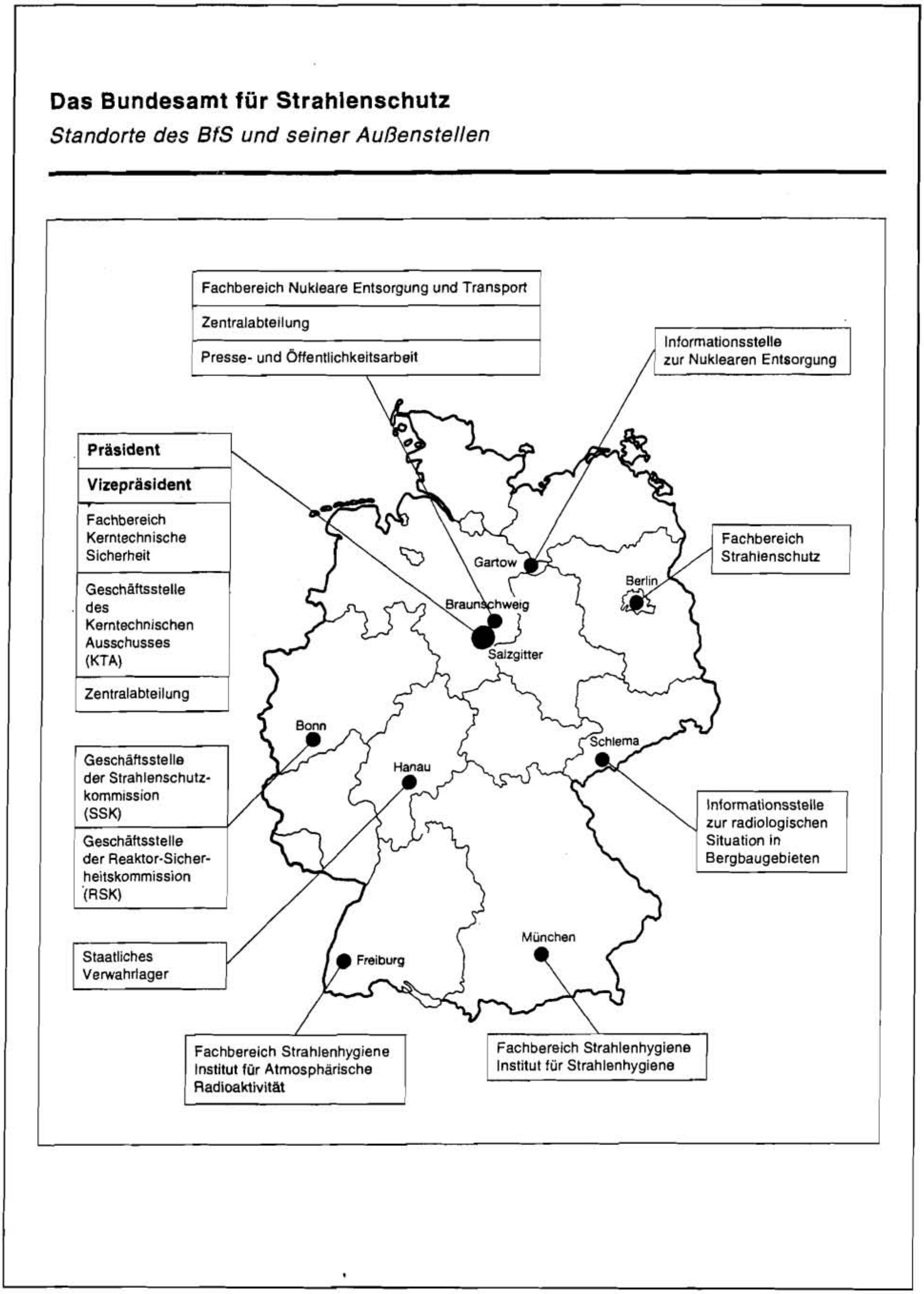


Fig. 1: Sites of the BfS and external sites

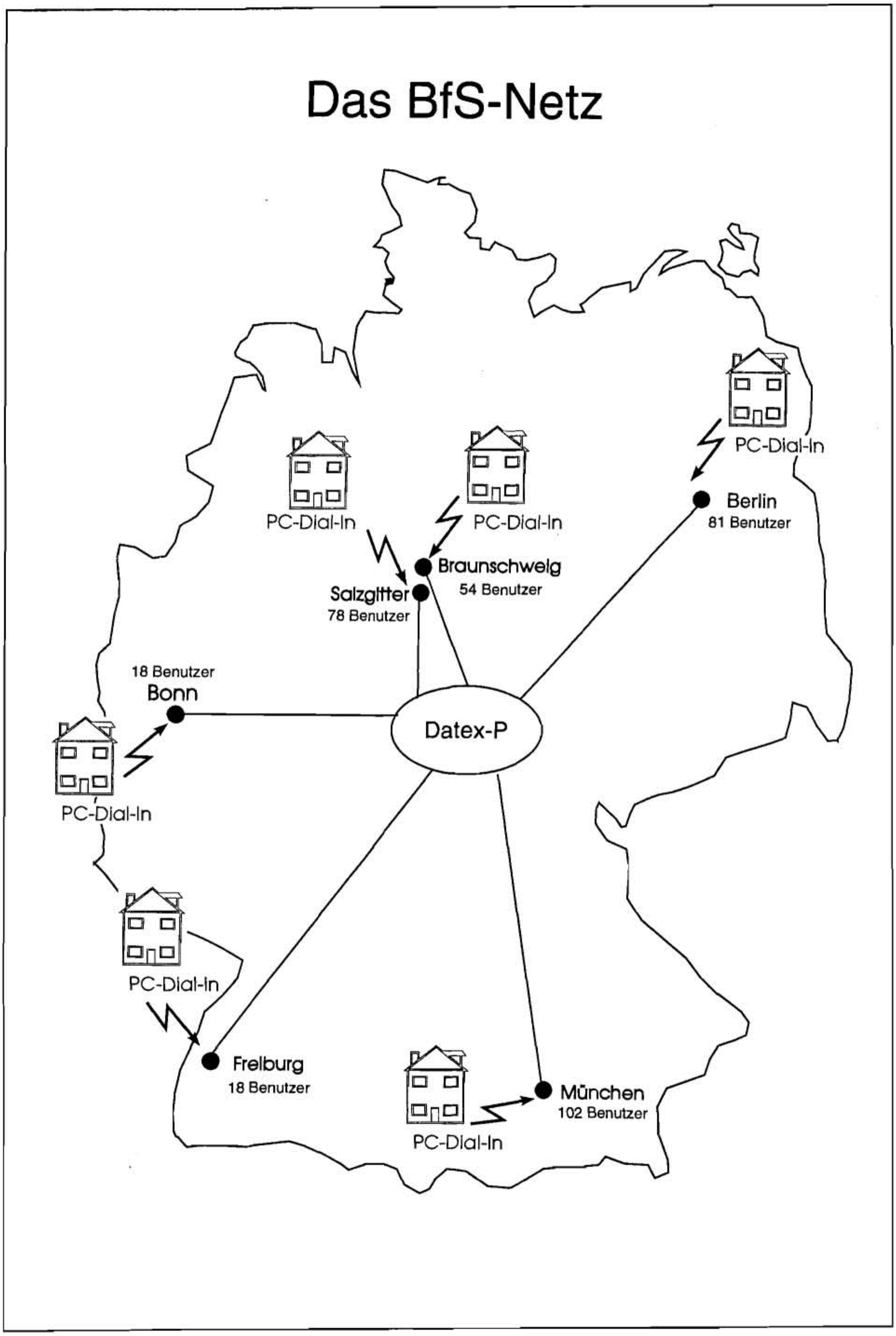


Fig. 2: The BfS network: 6 sites, 351 users

Information Management in Authorities
- The Landtag North Rhine-Westphalia -

W. Gärtner
Landtag Nordrhein-Westfalen, Düsseldorf

In the beginning of this Session 5, which deals with authorities, You hear some aspects of information management which are not quite typical for authorities. The management or the administration of a parliament has its own position in the range of authorities. You have been getting to know some aspects from the management of the Bundestag, our federal parliament. In Germany we have sixteen Laender, each of which has its own Land Parliament, and each parliament has its own administration or management.

So what is the purpose of this management? The purpose are the services provided for the parliament. That means

- o the Members of the Landtag and their assistants
- o the parliamentary groups and their staffs
- o the Landtag itself and its different committees.

The management of the Landtag Nordrhein-Westfalen is organized in the following way:

President
(Speaker)

Director at the
Landtag

Division I	Division II	Division III
Parliamentary Services	Administration	Information

Division I 'Parliamentary Services' has the following sections:

- o secretariats of the committees (organization of the meetings, preparations, assistance to the chairman);
- o stenografical (shorthand) services (shorthand reports of the meetings of the Landtag and its committees);
- o managing of petitions;
- o payment of the members of the Landtag.

Division II ' Administration'

- o Budget of the Landtag;
- o staff management/personell management;
- o property management;
- o organization of the authority;
- o data processing.

Division III 'Information'

- o information services;
- o public relations' services.

The division which is interesting for us now is the Division III "Information".

Division III
Information

Section III.1	Section III.2
Archive Documentation Center Library Information Office	Public Relations Press Office Visitors' Services

Information management is the job done by the Section called 'Information Services' in cooperation with the section which is responsable for data processing. That's why I will describe now the work and workflow in this section.

What kind of information is important for a Member of the Landtag?

electoral district		(own) political party
science, arts, research	MP	public opinion
parliament		government/administration

A Member of Parliament is faced with specific problems of information management:

- o from where or from whom can I get the informations I need?

  ----> **provision of information**

- o which are the informations that are important for me, and which are redundant?

  ----> **evaluation of information**

- o what do I do with the informations?

  ----> **processing of information.**

Information management for the parliament done by our administration in NRW means the managing of the sources

- o parliament (own, others)
- o government/administration
- o science, arts, research
- o public opinion (press, TV, radio).

In the section "Information Services" in the Landtag Nordrhein-Westfalen we are managing the following informations:

- o own parliament

  - o publications (proposals of laws, motions, questions)

  - o shorthand reports (parliament, committees)

  - o ordinances, regulations, guidelines.

  All these documents are indexed by documentarists in our documentation center completely from the beginning in 1946 up to now. There are printed indexes (in alphabetical order) for every electoral period up to 1985. Since 1985 there are data banks for the 10th electoral period 1985 to 1990 and for the 11th electoral period, which began in 1990 and will end in 1995.

  Publications of the land government are also indexed as far as they are directed to the Landtag.

- o other parliaments in Germany and European Parliament

  - o selected publications

  - o selected shorthand reports.

  - o ordinances, regulations, guidelines.

  There are printed indexes every year as well as a data bank with three data pools concerning the periods of 1980 to 1985, 1986 to 1990 and 1991 to (1995).

  This documentation service (the so-called 'Zentraldokumentation Parlamentsspiegel" - 'mirror of the parliaments') is a special service in NRW for all German parliaments and payed by all.

- o Science, arts, research

  In this field we are indexing selected articles from about 400 journals, magazines and periodicals which are important for the political work of the Landtag. We also index publications of the Land Administration. Retrieval is possible in a data bank beginning in 1986.

There ist also a library with about 50.000 volumes, and we get expert informations from external data hosts done by our retrieval services.

- o Public opinion

  In our so-called 'press documentation' we are indexing about 120 to 150 articles a day of political interest for the Members of the Landtag; this documentation is based on our daily press review. We are also indexing press statements of the Government and the political parties.

  Retrieval is done with our press data bank beginning in 1989.

All these informations are stored as bibliographical references with abstracts in a mainframe computer type SIEMENS (BS 2000); the retrieval system is GOLEM. Retrieval is done by documentarists in our documentation center on request, but we also give active information. Each Member of the Landtag and/or assistant can name us the subjects of his special interest. He will get from us a monthly extract from our data banks that delivers him bibliographical references to all new documents concerning his subjects.

The documents we refer to in our data banks are stored as images on optical discs. Up to now this means about 3,5 mio pages on 75 12" WORM discs. By this it is possible for us to provide all informations to the Members of the Landtag and to their staff in a very short time at a justifiable expense.

There is a link between the references in the GOLEM data bases and the full-text image documents on our optical disc system, which allows us to initialize the printing of all required documents during the retrieval session. It is even possible to export a publication by telefax services out of the optical disc system during the retrieval session. The optical disc system is in so far self-administrating.

The advantages of the optical disc system are

- o dramatically less need of space in the archive,
- o economical workflow in the archive (reduction of lending and especially of copying),
- o optimization of our services parts of which even can be used outside the opening and closing hours of the archive.
- o linking with the retrieval system.

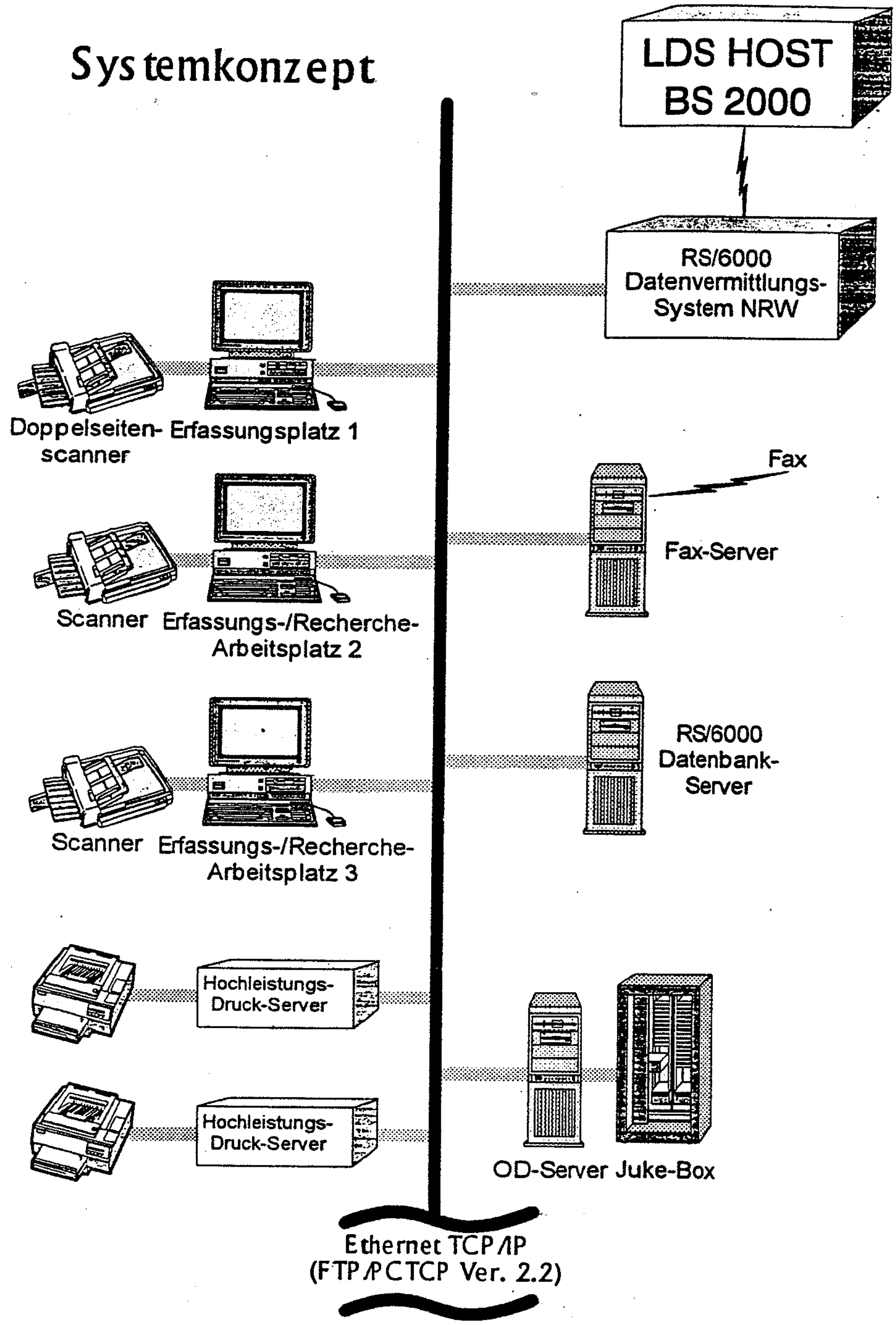
We are going to offer our retrieval system directly to our clients - the MP's, the staff - by developing a comfortable user-interface for the GOLEM data banks. Even today the retrieval languages, the syntax required, is still complicated and much too difficult for someone who is not trained on this subject. Most of our clients would like to do document retrieval by themselves, but they will only do it every three weeks or so. Our new user interface will allow to those clients to do retrieval instinctively without reflexion about Boole's algebra and mathematical operations. We give them a three-hour-introduction, and it works quite well.

Our next step will be a new optical storage system that will allow

- o us to store the inhouse documents immediately from our text processing system (This will allow retrieval in the full-text-documents);

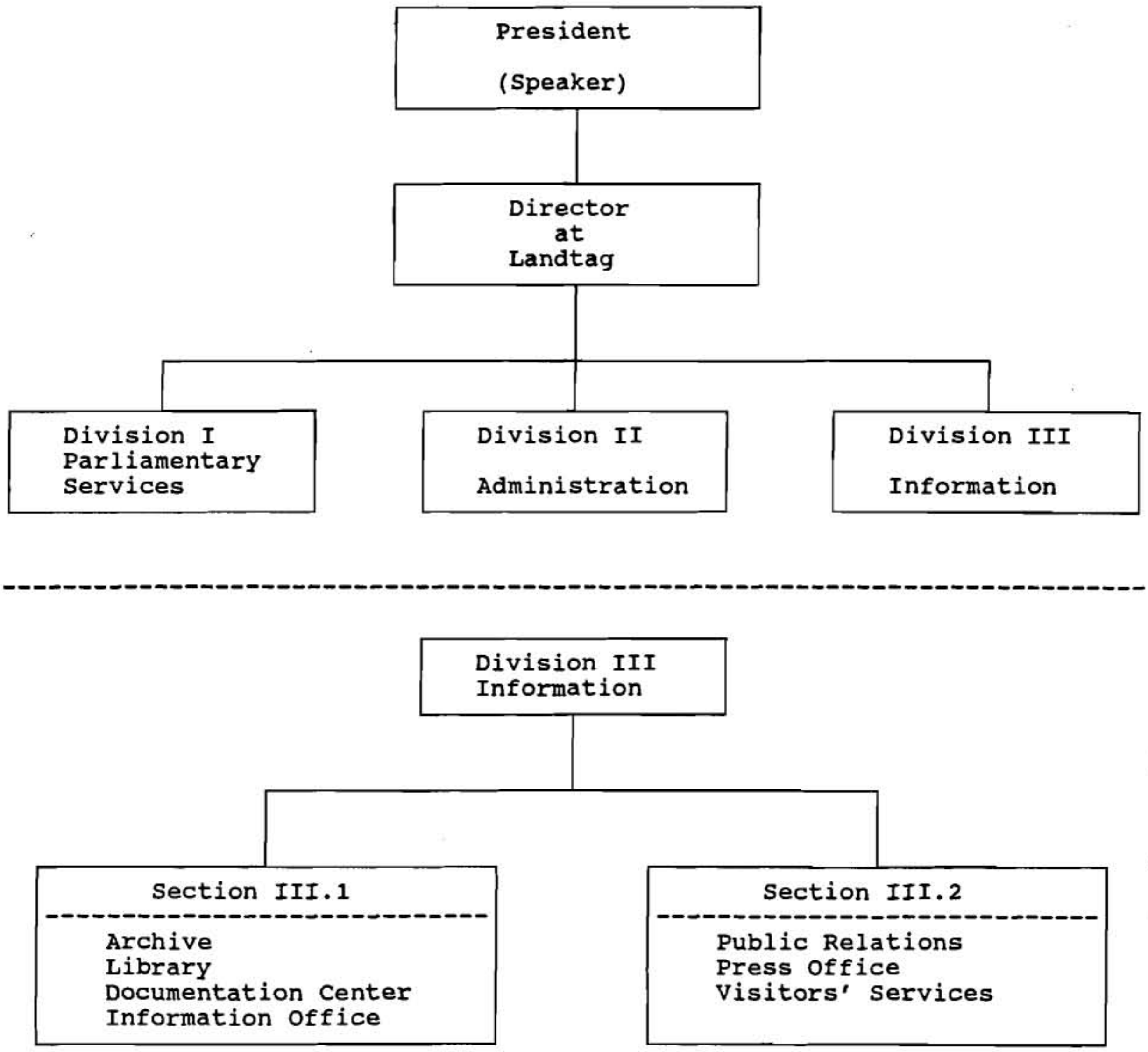
- o to our clients to get the documents on-screen or printed in their offices - not only in the building of the Landtag but also in their district bureaus.

3.2.3 Systemkonzept

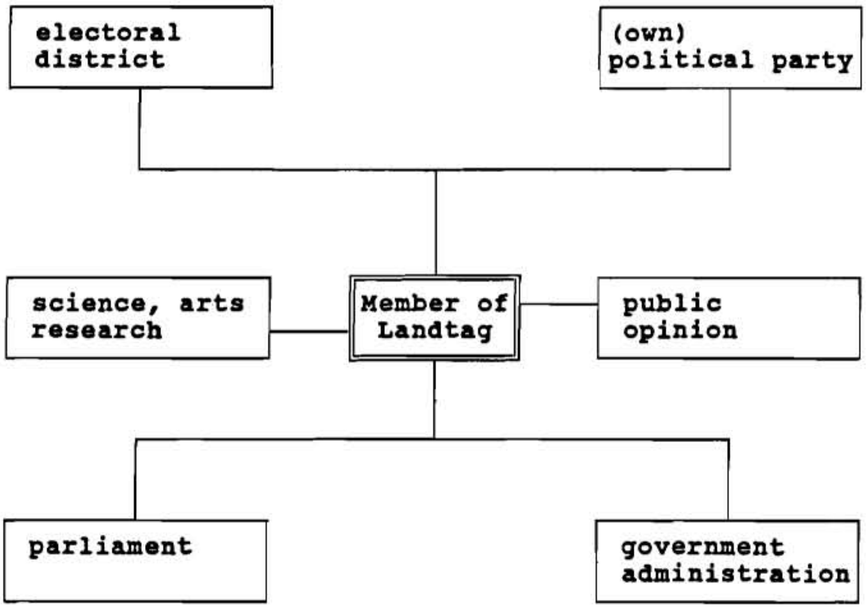


In der HYPERDOC Terminologie werden folgende Basiskomponenten unterschieden:

Organization of the Landtag Management



Sources of Information for Members of the Landtag



Information Management for Members of Parliament

o From where or from whom can I get the informations I need?

-----> **provision of information**

o Which are the informations that are important for me, and which are redundant?

-----> **evaluation of information**

o What do I do with all these informations?

-----> **processing of information**

Information management in the Landtag NRW: the sources

own parliament

- o publications (proposals of laws, motions, questions...)
- o shorthand reports (parliament, committees)
- o publications of Government as far as directed to Landtag

other parliaments in Germany and European Parliament

- o selected publications
- o selected shorthand reports
- o ordinances, regulations, guidelines

Science, arts, research

- o selected articles from journals, magazines, periodicals
- o library of the Landtag
- o external data hosts

Public opinion

- o daily press review
- o press statements of Government and political parties

Advantages of the Optical Disc System

- o dramatically less need of space in the archive
- o economical workflow in the archive (reduction of lending and especially of copying)
- o optimization of services in and outside the opening and closing hours of the archive
- o linking with the retrieval system

BELINFORMPROGNOZ

I. Antonovich
Council of the Ministers of the Republic of Belarus - Belarussian Institute of Scientific and Technical Information and Prognosis, Minsk

Belarussian Institute of Scientific and Technical Information and Prognosis of the Council of Ministers of the Republic of Belarus (Belinformprognoz) is set up in accordance with the Decree N 333 of the Council of Ministers of the Republic of Belarus of May 20, 1993 in order to accelerate and improve the process of information collection and analysis, set up data banks on the priorities of economic, social, political and cultural developement, organize information exchange with other information centers, provide information services to those who might be in need of it.

The main directions of the activity of the Institute are as follows:

- development of scientifically based concepts, models, programs for solution of political, social and economic problems of the Republic;
- economic, scientific and technical, social and political forecasting, working out of proposals and strategic initiatives on relaxation of social tension, prevention of social and political conflicts and outbreaks;
- registration of scientific-research and R&D works that are performed by the enterprises and organizations of the Republic for account of resources of state budget and special, besides budget, funds;
- conduction of studies in the field of marketing, managemant and innovation activity;
- provision of information services for the governmental agencies and private buisness organizations with recent economic and financial developments in the Republic of Belarus and other countries of the Commonwealth of Independent States.

Recently the Institute has begun drawing up the working priorities for 1994, inclusive of publishing activity. Special attention will be paid to the following items that are included in the thematic plan of the Institute on the basis of studying, analyzing and summarizing of the national and foreign sources of political, economic, social, scientific and technical and patent information:

- analytical information for making decisions on political, social, economic and scientific and technical developement;
- survey information, characterizing status and trends of main directions of development of national economy;

- information (materials on selected topics, technical information leaflets, topic references, etc.) for solution of socio-economic problems in the field of marketing, management and innovation activity, implementation of scientific and research works, R&D works and introducing them into production;
- reports and other analytical and information materials on market development in the Republic of Belarus, on definition of technical level and quality of products, their competitiveness for the managerial bodies of the Republic on the system of problem-oriented information of managers;
- publication of periodical bulletins on analytical diagnostics, long-term and short-term forecast appraisals, etc.

Belinformprognoz will introduce data on scientific-research and R&D works to the State register of scientific-research and R&D works, complete the fund of documents on these works, form data bank for data exchange on them with other countries, render methodical assistance on the issue of state registration of scientific and research works on the basis of documents provided by the organization-perfomers.

Belinformprognoz also provides for holding of:

- republican scientific-technical conferences, simposiums, workshops and meetings;
- continuous monitoring of economical and socio-political situation in the Republic;
- excursions, lectures, consultations, team trips for investigation of some problems, exchange of advanced technologies and know-how in CIS countries and in foreign countries;
- scientific-technical, commerical, permanent and mobile thematic exhibitions;
- marketing of PC-based databanks on offers of technology and joint-venture opportunities in Belarus and CIS, databanks with regularly updated business and commerical information on decision makers in business and politics in Belarus and CIS, full-text data bases on the current legislation and taxation background of doing business in Belarus and CIS.

The Institute will publish and disseminate information circulars, newsletters, updating information flows on the specific subjects of the economic, social, political and cultural development; a monthly periodical is forseen which could be available on subscription basis.

The Institute provides for associations, enterprises, companies and organizations of the Republic of Belarus with information about held and planned in CIS countries and abroad activities on scientific-technical propaganda.

Subject matter of information service in 1994 should be formulated in »Application on Information Service«, the text of which in October-November will be sent to ministries, agencies, associations, enterprises, organizations, private countries.

Simultanously, requirements for the materials published by the Institute are announced.

We take into account that all types of publications, ordered by organizations analytical surveys, information leaflets about scientific-technical achievments and advanced production-technical experience on interbranch issues of industry, bibliographic information, etc., should be fully recouped.

Organizations, ordering this or that type of information, should guarantee the payment of cost of publication and other expenses involved. Preparation and editing of information publications is done as per contractual prices.

The application of the customer can be accepted for consideration if all the requirements are met. Belinformprognoz is ready to examine the applications, not specified in the above mentioned list, referred to mutually beneficial exchange of information, scientific-technical developments, social and political forecasting.

Information Systems on Operational Disturbances in Ukrainian Nuclear Power Plants

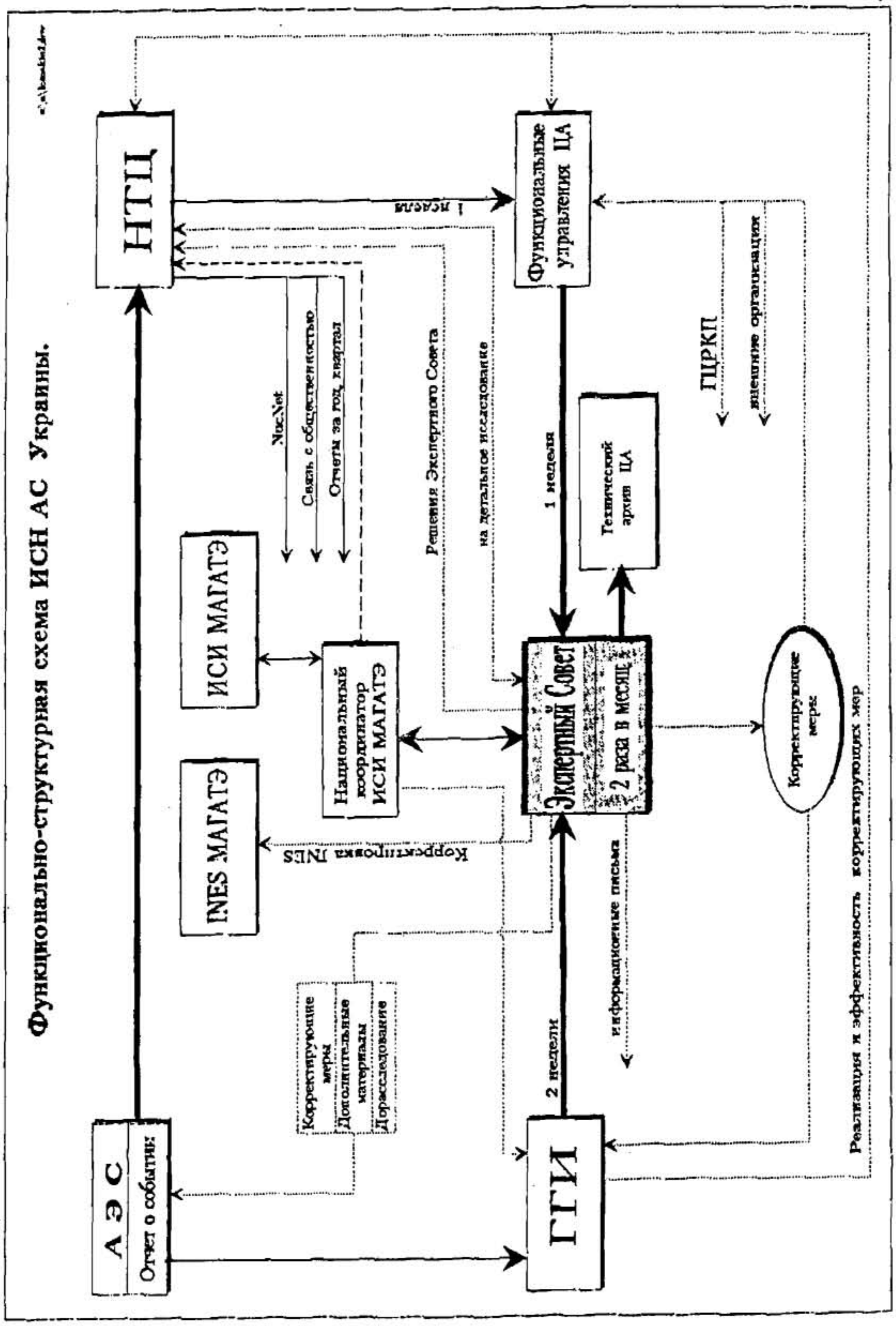
I. Kirshenbaum
Ukrainian State Comittee on Nuclear and Radiation Safety, Kiev

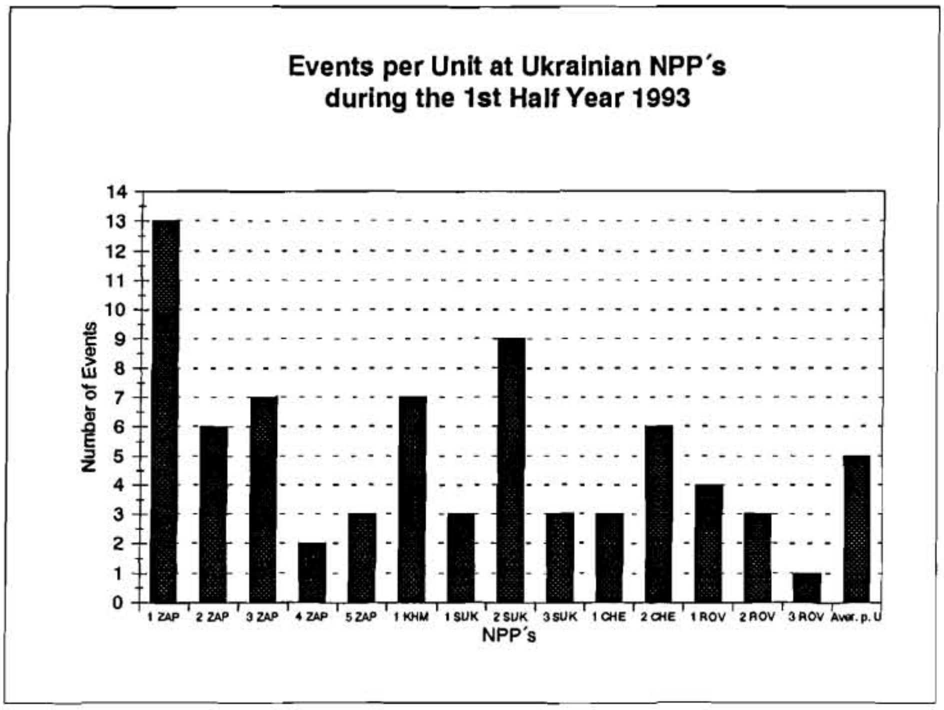
Цели ИСН :

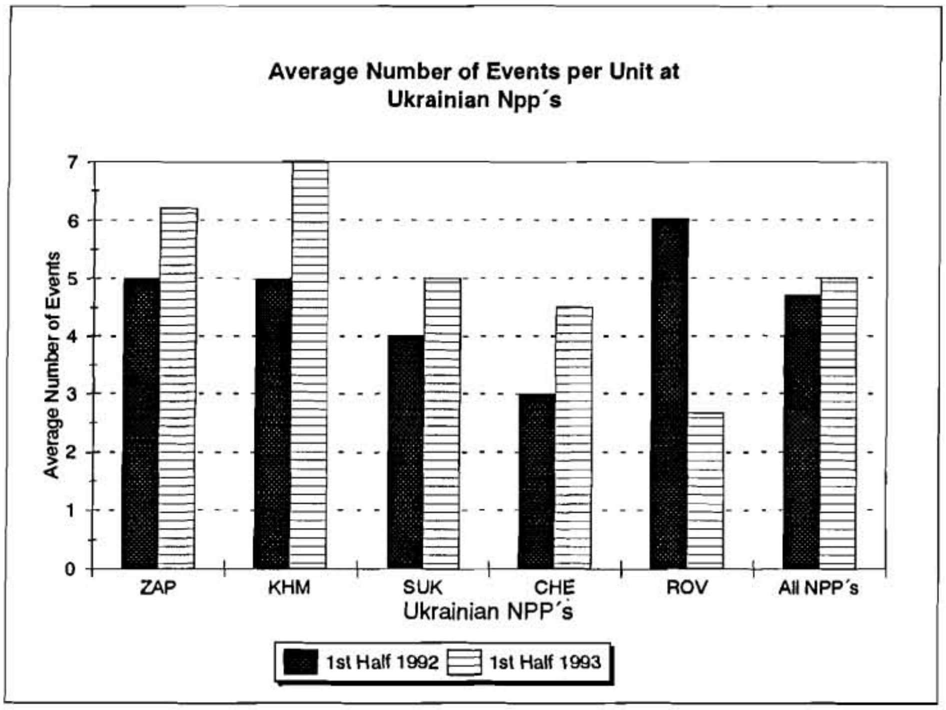
- предотвращение нарушений в работе на АЭС
- повышение эксплуатационной безопасности АЭС
- повышение надежности работы оборудования АЭС

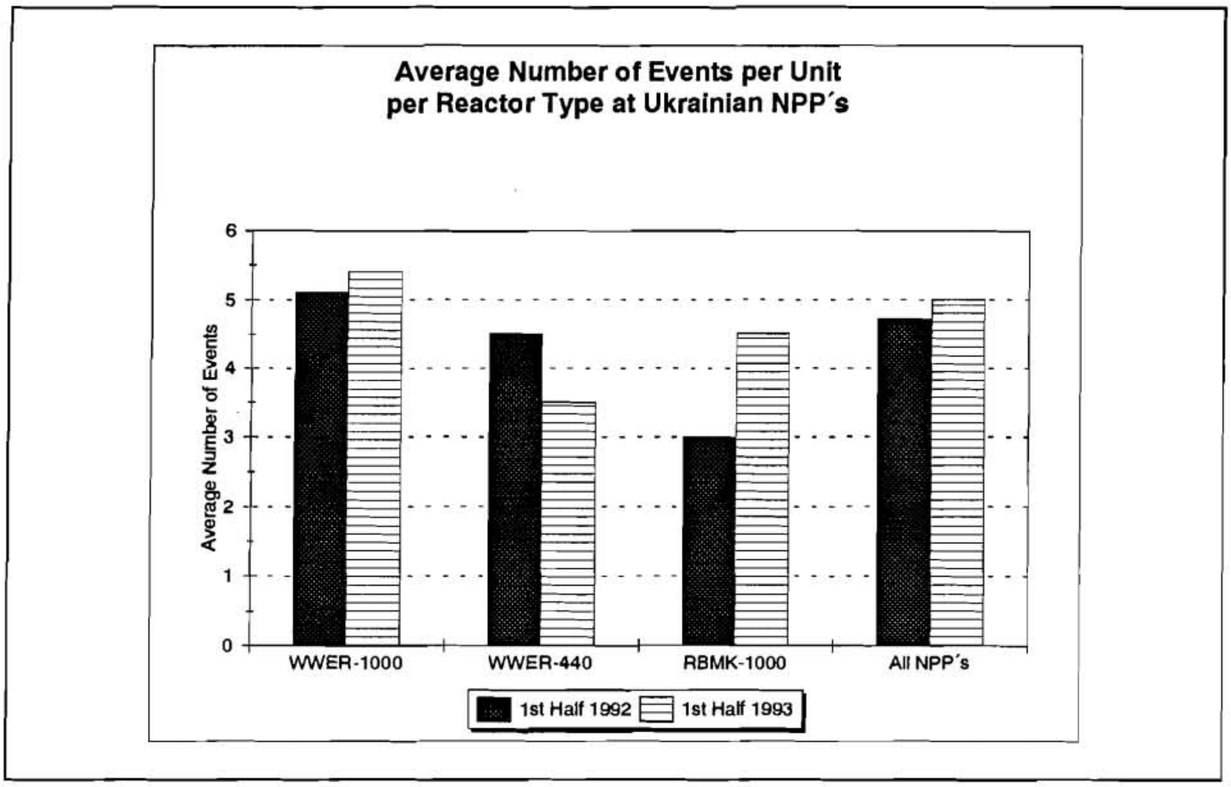
Задачи ИСН :

- Сбор информации о нарушениях в работе на АС
- Организация оперативного движения сообщений о нарушениях в работе на АС
- Анализ поступающей информации о нарушениях в работе на АС Украины
- Анализ сообщений о нарушениях в работе на зарубежных АС
- Контроль и учет выполнения мероприятий по безопасности на АС
- Организация взаимодействия и функционирования подразделений и структур Госатомнадзора, участвующих в работе ИСН.
- Информирование МАГАТЭ о нарушениях в работе на АС Украины (IRS-IAEA)
- Организация оперативной связи с АС и другими пользователями ИСН.
- Организация постоянной связи с общественностью Украины и организацией NucNet


Функционально-структурная схема ИСН АС Украины.
НТЦ
Функциональные управления ЦА
1 неделя
NucNet
Связь с общественностью
Отчеты за год, квартал
Решения Экспертного Совета
на детальное исследование
1 неделя
Технический архив ЦА
ГЦРКП
внешние организации
ИСИ МАГАТЭ
Национальный координатор ИСИ МАГАТЭ
Экспертный Совет
2 раза в месяц
Корректирующие меры
INES МАГАТЭ
Корректировка INES
информационные письма
Корректирующие меры
Дополнительные материалы
Дорасследование
2 недели
А Э С
Отчет о событии
ГГИ
Реализация и эффективность корректирующих мер


Events per Unit at Ukrainian NPP´s
during the 1st Half Year 1993
Number of Events
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
1 ZAP
2 ZAP
3 ZAP
4 ZAP
5 ZAP
1 KHM
1 SUK
2 SUK
3 SUK
1 CHE
2 CHE
1 ROV
2 ROV
3 ROV
Aver. p. U
NPP´s


Average Number of Events per Unit at
Ukrainian Npp´s
Average Number of Events
0
1
2
3
4
5
6
7
ZAP
KHM
SUK
CHE
ROV
All NPP´s
Ukrainian NPP´s
1st Half 1992
1st Half 1993


Average Number of Events per Unit
per Reactor Type at Ukrainian NPP's
Average Number of Events
0
1
2
3
4
5
6
WWER-1000
WWER-440
RBMK-1000
All NPP's
1st Half 1992
1st Half 1993

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