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The Engineering Subject Gateway (ViFaTec) and Biotech: Virtual Developments in Biotechnology

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Abstract

*The target group of the **Engineering Subject Gateway, ViFaTec** are people working
in the engineering and biotechnology fields. The origin and backbone of the **Engineering Subject Gateway** is the German National Library of Science and Technology.
Two other subject gateways one for Physics which is online and one for Wood Engineering in preparation are based here. The idea of the gateway originates from 1998
and it went online in April 2000. The goal of the engineering subject gateway was and
is to offer competent and compact information. The aspects of Biotechnology and
Bioinformatics at the engineering subject gateway are explained. The most recent developments like the preparation of the
Metasearchengine and the change of the Specialised Search Engine are described.
The paper concludes with a look at the goals and perspectives the gateway has taken.*

1.   Engineers and their ways of conducting research

The main focus when developing the Engineering subject gateway was and is the users interest. Since this is a technical oriented gateway, a look at the engineers' ways of conducting
research is taken.

A review of literature about the research habits of engineers and personal experience revealed
that engineers have certain methods for gathering information due to the nature of their tasks
and everyday work challenges.

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It is not possible to put the target group into a consistent definition group. A Survey shows that there is a big difference in the research habits of engineers themselves. They invest between 5 and 80 hours a month for research or any kind of information work depending on the kind of work they are involved. For example R & D people invest the highest amount of time researching. Also the tasks of engineers change so often that the need for information is constantly high. Another important aspect is the pressure of time under which engineers usually have to work and make their decisions which influences their way of researching.

The two most important reasons for engineers to search for information are:

- To solve a (technical) Problem,
- To prepare a well founded decision.

The literature states that the first step an engineer takes when he has exhausted all his sources for information on hand is that he asks the people surrounding him.

Advantages of asking his/her colleagues are

- They have the same way of thinking,
- They use the same technical terms and therefore understand the problem right away,
- They seem the trustworthiest since those are the people one seems to know best,
- Misunderstandings can be cleared right away.

The disadvantages are

- The information is very exclusive,
- Other people of the working team are/might be excluded from the flow of information,
- There are only a limited number of contacts.

Since engineers mainly are searching for information to solve a practical problem the following terms are most important for an information source:

- The source must be easy to handle
- Access must be fast and without a time limit
- There must be a high relevance of the information
- A high quality of the information should be given
- The information should be reliable

Therefore document collections that need to be judged and evaluated are not so useful.

2. The Origin of the Engineering Subject Gateway, ViFaTec

The origin and backbone of the Engineering Subject Gateway, ViFaTec is the German National Library of Science and Technology, TIB. It is the subject library of Germany for engineering and related sciences, especially chemistry, computer sciences, mathematics and physics.

It is an institution of the State of Lower Saxony, financed jointly by all Federal States (70%) and the Federal Government (30%) and is a member of the Wissenschaftsgemeinschaft Gottfried Wilhelm Leibniz, a research community.[1] The assignment of the German National

Library of Science and Technology is the sourcing and archiving of technical-natural science literature from all over the world plus the supply with literature and information for Research, University education and industry.

Two other subject gateways, one for Physics which is online, and one for Wood Engineering in preparation are based here. The Physics Virtual Library is offering access to information and services related to physics.

3.   The Engineering Subject Gateway/ViFaTec

The target group of the Engineering Subject Gateway, ViFaTec are people from the engineering branch and other in technical matters interested people plus people working at the biotech field because of its relation to technical matters. This covers academic people from students, research assistants or post-docs to professors, working people at all kinds of functions within big or smaller business units and private people interested in sophisticated scientific information.

3.1.   Idea of the gateway

The idea of the gateway originates from 1998 and it went online in April 2000. The integration of new media into the library world and the urge to meet the demands of Science, Industry and other users for current and high quality information lead to the idea of the Engineering Subject Gateway. The emphasis is placed on the supply with digital information, Internet Resources etc.. Access rather than ownership describes as a key phrase on of the goals of the Subject gateway. Others are to offer competent and compact information including further development and improvement. Permanent maintenance and updating keeps the content at a high quality. The Engineering subject gateway was built up with the support of the German research foundation, DFG.

3.2.   Realization

The engineering subject gateway is based on the integration of existing offers. The user needs good sorted, cumulated and complete sources. An access to relevant information and other services is offered.

The user expects an easy and comfortable access to the listed information. The Engineering Subject Gateway ViFaTec shows the way for example through our own document delivery system TIBORDER. For example if somebody is looking for a special book and finds out that it is out of stock he can try to search for and order it through our library catalogue system.

Through cooperations with other external providers of information we want to improve the access to information. Different databases of the Subject Information Center Technics (FIZ-Technik) from Frankfurt are offered as an integrated part of the ViFaTec. FIZ Technik is the national Center of Technical–Scientific Information and documentation for the support of Research and Science and a partner of the German National Library of Science and Technology for ViFaTec.

For the input of the ViFaTec it is looked for specialised and in technical matters relevant information and for experts in information.

The standard information sources of a library like technical literature, books, professional articles in journals, microfiche, cd-rom collections, databases, free and liable for costs, and others are offered.

Added to that are special choosen Internet ressources. The major number of the choosen sources are not company sites which offer their products but sites of organizations, unions and others which offer competent and well sorted link collections and other information of a broad range.

In addition to conference calendars, patents, standards and reference works you find numerical data, software offers, training offers, products, services and other things at the gateway.

There are different modules to use when searching for information in order to make this clear and easy to handle for the user.

3.3. The Modules

The five offered modules for the search for information are:

- ➢ The Meta-Search Engine in preparation,
- ➢ TIBORDER the document delivery system of the German National Library of Science and Technology,
- ➢ GetInfo, an electronic system for the supply of full-text in science and technology,
- ➢ The Subject Guide and
- ➢ The Specialised Search Engine.

3.3.1. The Metasearchengine, TIBORDER and GetInfo

There is offered a list of 21 databases both interdisciplinary and subject oriented, like FIZ-Technik, Online Contents Technik, Nasa Technical Report Server, EnergyPortalSearch etc. available via the Internet as long as **the Metasearchengine** is not working. This list is integrated into the Subject guide when the Metasearchengine is at work. The **Metasearchengine** for technical literature shall, when in action, offer a parallel search on 10 different data sources. The search and the titles at those databases are free and it is charged for when fulltext is ordered.

TIBORDER is a web based comfortable document delivery system for search and ordering in databases and the complete stock of the TIB. The search is free. But ordered full-text is charged for. There is direct online access to eletronic catalogues and documents. For example print Literature is scanned and converted in pdf files. There are various possibilities to get the literature, through email, download etc..

GetInfo is a joint venture of the German National Library of Science and Technology and the Subject information center Karlsruhe (FIZ Karlsruhe) for the supply of full-text in science and technology. The holdings of the German National Library of Science and Technology as well as the print data of more than 19500 grey-literature full text documents, like conference proceedings, research reports and dissertations plus ejournals of renowned international publishers and information providers are integrated in GetInfo so that in total about 50 000 current print journals are accessible. Inquiry and title are cost free, fulltext is charged for. [1, 3,6]

3.3.2. The Subject guide

Information in a clear and well-structured form is offered through the subject guide. Only collections of relevant printed and high quality electronic sources are listed, not single publications or very specialised Websites like from a little company. Some of the sources are free of charge others are not. Indexing depends on the relevance. The user shall decide himself which source he wants to use.

Within the Subject guide the user can choose from 10 different subject areas like Engineering basics, mechanical engineering, manufacturing engineering etc. and 9 filters like link collections, technical literature, organisations etc. Both the different subject areas and the filters shall support the user well structured and clear results, which makes it easier to handle. But the user also can ask for the whole collection, it is his/her decision. The subject headings are given either in German or in English depending whether the site is in german or English.

For example in the sector technical literature the following information sources are listed:

➢ Technical bibliographic databases: The subject guide refers to databases at hosts. So the user can reach further information about the database at the site of the host.
➢ List of books: List of new acquisitions from the libraries stock through the online delivery system, so that any user can order the literature online. The current collection of technical literature from the German National Library of Science and Technology or of amazon are offered.
➢ Collections of journals
➢ Important reference books[3]

3.3.3. The Specialised Search Engine

Through the Specialised Search Engine the user can search for the Services in the field of Research within the whole country. The access to Services of technical oriented university departments and university related and private research institutions and the potential of knowledge working in these institutions is offered. The offers range from free laboratory space to consulting offers. Among others the websites of technical oriented Max-Planck Institutes, the websites of Fraunhofer Society, engineering associations like the VDI, VDE, VDMA and other professional associations are indicated. The effort for professional support, when looking for cooperation partners in the Research field or the implementation of research results should be a lot smaller.

If the Specialised Search Engine is compared to one of the regular Search Engines like Google or AltaVista often times you will find similar results at both Search engines. The important difference is that at AltaVista you have a lot to do to sort out the important hits from a lot of hits that are of no interest to the subject. This can be set-aside at this Search Engine because of the strong technical emphasis.
Completing the search engine you can expand your search through the German University servers (forschungsportal.net) and the international Scirus web site.

Further cooperations with other institutions to develop the content offered are wished and in progress.[3]

4. Biotechnology and Bioinformatics at the engineering subject gateway

Since Biotech and Bioinformatics go through a strong development in Germany with a lot of different Websites it is important to offer some support when searching for information. Here the engineering subject gateway ViFaTec comes in. Even though Biotechnology is at the edge of engineering like mechanical or civil engineering it still has to be valued important as an interdisciplinary science since it influences different areas/subjects like environmental protection, technology concerning food production, medical science and others.

The German National Library of Science and Technology is, as mentioned above, the central subject library for chemistry, computer sciences, mathematics, physics and engineering including biological and chemical engineering. If you look at the biotech procedures especially those, which are used in the industrial environment, you usually cannot do without chemical and biological engineering.

Chemistry, computer sciences and math are part of the rather new science of Bioinformatics and Biotechnology. You need quite a few chemical procedures to do the analytic work in Biotechnology.
To deal with all the accumulating data when doing genomic research you need amongst others statistics as part of mathematics as a necessary tool. The need to handle all the data leads to different operating systems and the handling of different databases plus all kinds software. So computer sciences are important.

At the Subject guide you find Biotechnology information including bioinformatics under the main subject of Chemical engineering and process industries. The seventh sub-category is Biotechnology.

It is referred to national and international sources just like in all the other aspects of our gateway. The main focus is the users interest.
Our Links refer to all kinds of genetic research the genome of plants, the human genome or the genome of other living creatures. Besides that a lot of supporting software can be found when dealing with high amounts of data. Also the collection of the latest important literature on the issue of biotech and the collection of electronic journals is integrated.
At the specialised search engine different service offers of research institutions or similar involved into Biotech can be found.

In Germany some of the Max Planck-, some of the Fraunhofer Institutes and Institutes of the Helmholtz Society are strongly involved into the biotechnology and bioinformatics research and business. [8]

5. Latest developments

In June this year a partly new design of the specialised search engine which supports browsing/ search within certain subject areas and under an alphabetical order is implemented.

The Metasearchengine will be integrated this summer including a partly redesign of the ViFaTec Website. There the Meta Search within 10 different technical oriented databases will be offered. These are the catalog of the German National Library of Science and Technology, TIBORDER including the database Online Contents (ETOC) and the database Conference Proceedings of the British Library. Also GetInfo, the web service for full text supply, 5 data

bases from FIZ Technik and the Fraunhofer Publica database from the Fraunhofer Society will be included. The list of databases, which are offered at this place so far, will be integrated into the module Subject Guide.

The development of the core of the Metasearchengine is organised in cooperation with the gateway to physics, which results in synergetic effects in hard- and software.

6. Summary and Perspective

In the previous talk a look at the target group of a technical gateway who are mainly engineers was taken. They have certain ways of reaching for information that were described. They put the emphasis on the nearby information due to working and time pressure. Also this kind of information seems the most reliable.

Then the origin of the Engineering Subject Gateway, the German National Library of Science and Technology was described. The main issues of this talk were the modules of the Engineering Subject Gateway. These are the Metasearchengine in preparation, TIBORDER the document delivery system, GetInfo the full-text supply, the Subject Guide and the Specialised Search Engine. The aspects of Biotechnology and Bioinformatics at the gateway were described, like the relation of Biotech to the library and how to reach this specialised information.

Closing up the latest developments of this gateway that are the changes of the Specialised Search Engine and the development of the Metasearchengine were mentioned. And a look at the goals and perspectives of the gateway was taken. These are planned cooperation's with other institutions to put the maintenance and the development of the content on a broader base. Another important aim is to integrate ViFaTec into the german wide science gateway in preparation named VASCODA.

To sum up the key aspects of our work:

> ➢ To keep the Website updated and at a high academic level through the technical work of evaluation, development and the supply of information sources,
> ➢ Cooperations with people and institutions who offer content
> ➢ To do marketing for the Website ViFaTec

Any inquiries for Cooperations are welcome!

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