Scientific Information and Its Usage - Research Results Based on the Analysis of Master Theses Defended During 2003-2004

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Introduction:

This article focuses on analyzing and researching a particular situation of information seeking and the use of information (e.g. collecting the theoretical basic material for master paper). In addition the reasons of the obstacles that tend to emerge during the search for the scientific information are observed. In general it is assumed that people involved in science have the necessary information literacy skills and so searching for the information cannot be hard for them. This article shows that these beliefs often turn out to be myths and the professionals working in the libraries still have much to do to help them to acquire information confidence.

The aim of this research was to analyze the use of online databases provided by Estonian academic libraries based on the defended master theses in Estonian universities (Tallinn University of Technology and Tallinn University) during the last two years (2003-2004). The main goal was to find out how many times the authors of the master theses referred to the sources available in the databases and how much the newest scientific information they used.

According to the aim of the research, the main tasks are:
- to find out how many times the authors of master theses in Tallinn University and Tallinn University of Technology have referred to the sources available in online databases;
- to compare the use of databases in Tallinn University and Tallinn University of Technology 2003-2004 defended master theses;
- to compare the use of online databases in different faculties of Tallinn University of Technology;
- to compare the use of online databases in different faculties of Tallinn University;
- To analyze the main obstacles of the information searching.

Estonian libraries and the scientific information

The need of this research was elicited by the circumstance that the creation of the electronic library requires increasing the expenses, but actually the budgets of the libraries are being decreased. Acquiring the scientific information about exact and natural sciences is especially expensive. The complicated subordination of the scientific institution is the root of many

problems, since the neighbouring institutes could belong to different authorities. Therefore, the access to these databases is bought by different libraries. On the other hand the two biggest libraries in Estonia do not have the institutions to buy the licences of the electronic databases for. However, the access to the electronically provided academic information must be guaranteed to the scientists 24 hours a day and everywhere. Estonian academic system is gone through serious reformations and the biggest part of the scientific development researches is carried out in the universities. However, the budgets of the university libraries are not sufficient to buy electronical academic information. In addition, the creation of the electronic library requires reorganization of the network of the academic libraries.

Many Estonian scientist have been estranged from the present library system, because very often they have had to conclude that after a long time searching they have gathered only a little necessary information. If there is a lack of the critical mass of scientific information, the scientist decides to go to Finland, where he/she can find access to the thousands main science magazines via colleague's or university library's computer. Academician Jaak Järv has said: "Through keywords it is possible to find everything. You will find in one magazine one keyword and following that, you can continue with another. I can see, who has publicized something with this keyword and who has referred to my article." While organizing the the seminar "Digital academic information and scientific libraries" in Estonian Academy of Sciences in May 2001, Jaak Järv wrote in the TUT newspaper: "In Estonia we are still missing the system, which will assure as well to the scientist as to the developers access to the digital up to date scientific information. This system has been created and is now already working elsewhere. We do not have it and not because of the lack of money, but because of the inaptitude and incompetence of the clerks."

It is true that the scientists cannot really imagine how much time and money it needs to create one seemingly simple but well-functioning system. Everything you can access through internet is considered to be free of charge or very cheap. It is hard to see the role of the library when finding information on the internet, but when the full-text of the desirable article is left out of reach, the libraries are very easy to receive the blame for it. The accusations: "Why do we need a library, I prefer to use the Science Direct" are not rare at all. Misunderstandings can only be prevented by informing the users enough. Nevertheless, there are also some examples, where the co-work with library has been very productive. The Economics and Business Administration of the TUT has invested in improving the access to the online fulltext databases and bought the licences for its library.

Well-functioning e-library FinELib in Finland has been created and funded by the Ministry of Education. The Finnish Ministry of Education budgets for the common buying 18 million FIM to supply the universities better with the electronic academic information and universities themselves added by themselves extra 7 million FIM in year 2001.

The experiences of other countries show as well, that when creating the electronic library, the expected saving has not been achieved, but the scientists' access to the academic information has been improved.

In 1998 the consortia started to co-ordinate the compilation of electronic issues, when corresponding workshop started to chart the informational needs of the users of the member libraries of the consortia, the electronic resources on the database market and so find out the priorities and determine the possible requests of common procurements.

The testing of the databases available on the Internet started in the bigger libraries in Estonia in 1998. The Internet connection was much slower than expected, but stabile enough to

outweigh on-the-spot CD-ROM databases. Libraries became aware, that it is profitable to form consortia to get more profitable contracts from the publishing houses.

In November 1998 the ELNET-consortia founded the co-coordinating workgroup of creating electronic knowledge. In 1999, the fulltext-databases were bought, whereby 3 libraries made the deal to buy together EBSCO-fulltext-databases and reached so to the special offer from EBSCO. Tartu University Library, The Estonian National Library and Estonian Academic Library collectively bought EBSCO Academic Search Elite-database. It was the first step for Estonia to create consortia for buying electronic information – common habit in the world history.

Up to April 01, 2005, Estonian libraries have together acquired the access to the following publications:

- **Electronic magazines of the main publishing houses :**

  - American Physical Society
  - Blackwell Synergy
  - Cambridge University Press
  - Elsevier ScienceDirect
  - Institute of Physics
  - Kluwer
  - Oxford University Press e-magazines
  - SpringerLink
  - Springer Lecture Notes in Computer Science
  - Emerald Fulltext

  - EBSCO databases
  - 7188 e-magazines
    EBSCO Academic Search Premiere
    EBSCO Business Source Premiere
    EBSCO Health Source: Nursing/Academic Edition
    EBSCO MasterFILE Premiere
    EBSCO Newspaper Source
    EBSCO Regional Business News
    EBSCO Health Source - Consumer Edition
    Clinical Pharmacology

- **Reference-databases**

  - Inspec
  - MathSciNet
  - Zentralblatt MATH Database
  - Medline
  - PsycInfo
  - SciFinder Scholar
  - ISI Web of Knowledge

- **Reference-books:**

    o Oxford Reference Online
    o Oxford English Dictionary
    o Grove Music Online

- **Temporary testing:**

    o SCOPUS

- **Scientific magazines with free access:**

    o Directory of Open Access Journals
    o BioMed Central

- **Information about grants and science**

    o Research Europe Online

Tallinn University and Tallinn University of Technology

Tallinn University (TU) has acted as a promotor of new educational ideas and as a center for teacher training in Estonia for more than 80 years. The University has rapidly expanded during the last decade, the number of students has grown from 2200 in 1992 to 6976 in 2002. Today TU has secured itself a place as a central training and research establishment in Tallinn, focusing its activities besides the teacher training also to humanities, social and natural sciences, developing programs in sports and fine arts. The Tallinn Teachers' Seminary, the forerunner of Tallinn University, celebrated its inauguration on the 15th of September 1919. Since 1992 the establishment has borne the name of Tallinn Pedagogical University and since spring of 2005 the university's name has been changed to Tallinn University.

The University also has two colleges: Haapsalu College and Rakvere College and research institutions: Institute of Ecology, Institute of International and Social Studies, Institute of Educational Research, Institute of Estonian Demography, Centre for Contemporary Cultural Studies, Women's Studies Centre, The Environmental Psychology and Sociology Research Unit.

01.10. 2004 there were 7246 students at Tallinn University:
- Faculty of Philology 212 students
- Faculty of Educational Sciences 337
- Faculty of Physical Education 22
- Faculty of Fine Arts 94
- Faculty of Mathematics and Natural Sciences 220
- Faculty of Social Sciences 514
- Haapsalu College 53
- Rakvere College 20 master's students.

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Tallinn University of Technology was founded in 1918 but was granted the rights of university in 1936. Today it is the only university in Estonia providing higher education in technology.

In 1918 the university started teaching mechanical engineering, electrical engineering, shipbuilding, water engineering, construction and architecture. Later the departments of land reclamation, surveying and technical chemistry were opened. Meeting the needs of the defence force, the department of marine engineering and mechanics was founded. The school of ship's mechanics operated in the polytechnical school.

In 1923 the National Test Chamber started its work, where beside applied research also advanced research was carried out. The main focus was on the use of natural resources in building, energetics and chemical industry.

In 1936 teaching of engineering started, and according to the act of the President of Estonia, the polytechnical school was renamed Tallinn Institute of Technology. According to the act it was a university of technology with three departments: departments of construction, chemistry, and mechanics and mechanical technology. By the Statute of the University, which became effective on 1 January 1938, the Institute of Technology was named Tallinn University of Technology with two faculties: the faculty of construction and mechanics, the faculty of chemistry and mining engineering. Research was carried out in newly opened laboratories. Conferring of academic degrees was started. A year later, students of electrical engineering were admitted, the faculty of economics was opened in 1940. In 1958 the faculty of energetics started where disciplines of heavy current were assembled; disciplines of low-voltage current necessary to new technologies were taught in the faculty of automatics opened in 1965.

In 1941 and from 1944 to 1989 the institution was called Tallinn Polytechnic Institute. By the decree of the Cabinet of the Estonian Socialist Soviet Republic (No 257 of 21 July1989), Renaming of the Universities of ESSR, Tallinn University of Technology was re-established.

The changes following the re-gaining of independence also determined the reorganization of the training of engineers and economists according to the needs of a small country. The organization of training, management principles and financing needed to be changed.

At the moment the university has 8 faculties:

- Faculty of Civil Engineering
- Faculty of Power Engineering
- Faculty of Humanities
- Faculty of Information Technology
- Faculty of Chemical and Material Technology
- Faculty of Economics and Business Administration
- Faculty of Mathematics / Natural Science Science
- Faculty of Mechanical Engineering

The university has 10 327 students (8 Sept 2004), the number of master's degree students was 1761 then.

Since the late 1990s, several research institutions of thence Estonian Academy of Sciences have merged with the university. At the moment there are five institutes: Institute of Economics, Cybernetics, Sustainable Technology, Marine Systems and Geology. Also, the students can enter the Colleges of Tallinn, Kuressaare and Virumaa.

Tallinn University also coordinates the research of two main research centres of the EU and the research of three Estonian centres plus eight research centres of TUT. One of the major projects is the Tallinn Technology Park.

ONLINE Databases made available by university libraries:

Library of Tallinn University allows to the people involved in scientific research, access up to 20 003 magazines, which are gathered into library using different intermediaries.

Libraries have acquired the access to the following databases:

- ScienceDirect
- EBSCOhost Web
- Blackwell Synergy®
- SpringerLink
- Emerald Fulltext
- The American Physical Society ajakirjad PROLA
- the Institute of Physics (IOP)
- MathSciNet (Mathematical Reviews on the Web)
- Zentralblatt MATH Database
  OCLC (Online Computer Library Centre) FirstSearch
- BNS – Baltic News Service
- Directory of Open Access Journals

Thanks to the scientific information gathered to these databases, almost all the Tallinn University studies and academic works are covered. The students of Faculty of Educational Sciences and Faculty of Social Sciences, as well as students of Faculty of Philology and Faculty of Mathematics and Natural Sciences (and all other people doing academic researches in the other fields) can easily and very effectively attain fresh academic information.

Tallinn University of Technology offers to its people dealing with academic researches access to the following 39 magazine-databases and 13 books-databases
E-journals:

- ACM Digital Library
- ACS Publications
- Annual Reviews
- APS Journals
- Blackwell Synergy
- BNS Terminal
- Cambridge Journals Online
- Compendex
- EBSCOhost EJS
- EBSCOhost Web

- Emerald Fulltext
- European Research Online
- FSTA
- GeoRef
- Iconda
- IEEE Xplore
- INIS
- INSPEC
- IOP Electronic Journals
- JSTOR
- Kluwer Online Journals
- Materials Science: A SAGE Full Text Collection
- MathSciNet
- Mechanical and Transportation Engineering Abstracts
- Metadex
- Nature Online
- OVID andmebaasid: FSTA, Iconda, Medline
- Oxford Journals
- ProQuest Digital Dissertations
- ProQuest Science Journals
- Science
- ScienceDirect
- Scientific.Net: Materials Science and Engineering
- SciFinder Scholar
- Scopus
- SpringerLINK
- Web of Science
- World Bank Online Databases
- Zentralblatt MATH

e-Books
- Britannica Online
- CRC Handbooks
- ebrary
- Gale Virtual Reference Library
- Knovel
- Lecture Notes in Computer Science
- Oxford Reference Online
- Referex Engineering
- ScienceDirect: Book Series
- ScienceDirect: Reference Works
- Vector
- VTT PUBLICATIONS
- Yearbook of International Organizations Online

As said above, in TUT there is access to 39 magazine databases and 13 books databases. All the faculties have an opportunity – hence of their character – to use 8-10 online databases. When buying databases, the consultations with the lecturers are carried out, as well as after

some time of usage interviews will be conducted to find out the need for these databases. There is an active work going on in every subject and all fields of study of TUT are supplied with the newest academic information.

The Universities research: Defended master theses 2003-2004

In 2003 there were 161 master theses defended in Tallinn University: Faculty of Philology (19), Faculty of Educational Sciences (32), Faculty of Physical Education (3), Faculty of Fine Arts (6), Faculty of Mathematics and Natural Sciences (30) Faculty of Social Sciences (66) and Institute of Educational Research (5).

From 161 defended master theses there were links to online databases in 31 of them (The total of sources used was 9499, from which links to databases 79).

In 2003 there were 219 master theses defended in Tallinn University of Technology: Faculty of Civil Engineering (18); Faculty of Power Engineering (11); Faculty of Humanitarian (32); Faculty of Information Technology (24); Faculty of Chemic and Material Technology (22); Faculty of Economics and Business Administration (62); Faculty of Mathematics/Natural Science (9); Faculty of Mechanics Engineering (41).

From 219 defended master theses there were links to online databases in 18 of them (the total of sources used was 8418, from which links to databases 109).

In 2004 there were 147 master theses defended in Tallinn University: Faculty of Philology (23), Faculty of Educational Sciences (37), Faculty of Physical Education (0), Faculty of Fine Arts (9), Faculty of Mathematics and Natural Sciences (29) and Faculty of Social Sciences (45), Institute of Educational Research (3), Institute of Estonian Demography (1).

From 147 defended master theses there were links to online databases in 36 of them (the total of sources used was 8827, from which links to databases 192).

In 2004 there were 277 master theses defended in Tallinn University of Technology: Faculty of Civil Engineering (22); Faculty of Power Engineering (21); Faculty of Humanitarian (23); Faculty of Information Technology (55); Faculty of Chemic and Material Technology (25); Faculty of Economics and Business Administration (100); Faculty of Mathematics/Natural Science (13); Faculty of Mechanics Engineering (18).

From 277 defended master theses there were links to online databases in 32 of them (the total of sources used was 9664, from which links to databases 256).

Tallinn University carries out the database-trainings in accordance with the reservations of the faculties. Up to now the Faculty of Educational Sciences and Faculty of Social Sciences have been very eager to participate in these trainings. Thanks to participating in these trainings there are somewhat better results in these faculties and more references to the scientific articles listed in the databases are found in students' papers.

Although very ample choice of electronic magazines enables to spread interesting and necessary information to schoolchildren, teachers, students, scientists and citizens, the researches show that online databases are not very widely used in master theses.

Three databases most used in master theses were EBSCO, Science Direct and Emerald.

Masters of the Economics and Business Administration and Faculty of Humanities of TUT and masters of the Faculty of Educational Sciences and Faculty of Social Sciences of Tallinn University were the faculties in which' master theses the online databases were used more often than in other faculties.

Problems and obstacles in the use of online databases

Online databases can be used in the premises of University of Tallinn or in the university's library, but unfortunately not at home. However, TUT offers to their readers to use database through TUT network even at home.

The following general tendencies occurred in the research are:
- the use of online databases is lesser than expected;
- there are no differences in the use of online databases depending on the universities;
- There are big differences in the use of online databases depending on the subject and faculty, e.g. in TUT mostly used database masters of the Faculty of Economics & Faculty of Humanities; in Tallinn University TUT-s masters of the Faculty of Educational Sciences and Faculty of Social Sciences

Little usage of online databases mostly derives from:
- habits
- language skills
- requirements of the academic works
- ignorance of the tutors (older generation)
- convenience

There are also other possible reasons for little use of databases. Many master theses have topics, about which there are no material in the fulltext scientific databases, e.g. analysis of Estonian national culture and folklore; analysis of Estonian philology; analysis of Estonian school- and educational system; data about Estonian nature, Estonian banking system and Estonian economics etc. On the other hand – it would be very good to use analysis or information about other similar or different cultures, or about other researches carried out all over the world and compare the information with local one. This information is easily found in the specialized scientific magazines, which can be accessed via databases.

Since 1990s it is argued that the importance of the libraries will decrease due to the increase of the digital information (Odlyzko, A.M 1997). In reality the importance of the libraries in connection with the digital information has not decreased, but changed - the library is acting like a mediator, educator and the teacher of information literacy and the role of the library in general is more important. The libraries should consider that some of the readers are notcapable of adjusting to the fast and radical changes in library service, the users of the service do not have enough information literacy skills and that is why they prefer traditional library services. The education and councelling in the field of the use of databases is crucial here. That is the place where academic libraries have a lot to do. It is possible to include the teaching of the use of the databases in the university program. Tallinn Technical University

and Tallinn University have already done that, but not enough yet. So far the lectures are provided only in the master program, but the knowledge of databases is important to the bacalaureate students as well. But the libraries have to do everything to guarantee the minimal critical amount of electronic science magazines and databases that the scientists need. But this cannot be done without additional financing. The state should find the resources not only for

financing the science projects but also for obtaining the necessary scientific information. The best possible solution could be to learn from the experience of the Finnish FinELib and to establish an electronic library to serve the needs of the scientist all over Estonia.

So far, the problem that the creators, bidders and users of the information do not meet each other, remains unsolved. This problem requires more constant and close study, analysis and publications of researches. It is necessary to enhance the habit of using databases and widen the knowledge about the databases and the possibilities to use them.

Libraries can do a lot to offer assistance in obtaining academic information much better than now. They could be much help in arranging of the readers training as well as advertising these trainings. The librarians can also assist readers individually, suggesting them appropriate scientific databases. The trainings should be arranged not only for students, but first of all to the tutors and professors, who in turn will lead the students to the databases.

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