A controlled vocabulary for nursing and allied health in Norway*

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Abstract

Nursing and allied health libraries at educational institutions in Norway have generally indexed their book collections with uncontrolled terms. With the reorganization of higher education in 1994, the majority of these libraries joined BIBSYS, which is a joint library system for higher education and research in Norway. This has led to chaos when searching the joint catalogue for literature on nursing and related fields. A term such as 'behaviour problems' may have up to five synonyms.

In an attempt to improve the quality of searching the health literature, BIBSYS appointed a working group in the Spring of 1999 to find a suitable controlled vocabulary for this subject area, and to see how this vocabulary could be integrated into BIBSYS. The group presented its recommendations in October 1999. The report has been well received by the BIBSYS Board and by user groups.

There are no Norwegian vocabularies that are suitable for use in nursing and allied health, therefore it will be necessary to translate and combine existing thesauri. The group has looked at the Nordic Multilingual Thesaurus on Health Promotion, the Swedish Spriline Thesaurus, MeSH (Medical Subject Headings) and CINAHL Subject Heading List. Other relevant thesauri are AMED/CATS Thesaurus, Bioethics Thesaurus (Bioethicsline) and the RCN thesaurus.

The group recommends the development of a Norwegian thesaurus based on a translation of parts of MeSH and CINAHL Subject Heading List.

Background for the study

The education of health care professionals in Norway mainly takes place at colleges, and in part, at the universities. The term 'health care' is used to cover a wide range of professional studies in Norway, including nursing, physiotherapy, radiography, laboratory techniques, speech therapy, occupational therapy, caring for people with learning difficulties, and to a certain extent, social welfare. Library services for health care students are provided by college and university libraries. Services to qualified professionals vary according to their place of work.

A major educational reform in 1994 led to the amalgamation of nearly 100 colleges into 26 colleges. Approximately 30 independent nursing and allied health colleges became faculties within these new colleges. The libraries of these colleges

have become part of the multi-disciplinary libraries in the new institutions. With encouragement from the Ministry of Education, Research and Church Affairs, most of the college libraries have joined the library system called BIBSYS. BIBSYS was originally a joint project initiated by the four Norwegian universities. It provides a joint online catalogue, lending and interlibrary lending system and other housekeeping functions for its members. BIBSYS is developed by its members who have representation on its board and council, and in user groups. A joint meeting for all its users takes place every autumn.

The problem of searching for health care literature has been discussed several times at the annual BIBSYS meetings. Searching is imprecise because of the use of uncontrolled terms in the catalogues of the former health care colleges. Local variations in indexing, which were acceptable in individual library catalogues, are problematic in a union catalogue. As an example, there are five different uncontrolled terms for 'behaviour problems' in BIBSYS (see Table 1).

This led to BIBSYS appointing a working group to look into the need for a controlled vocabulary for nursing and allied health. The group consisted of two librarians from university medical libraries, two from college libraries and one from BIBSYS (the present authors). The group started its work in April 1999 and presented its recommendations in October 1999.

The mandate was:

The working group shall assess the need for a controlled vocabulary for nursing and allied health for use in the BIBSYS system and prioritize different solutions, based on the needs and wishes of the libraries it concerns. The working group

shall see if an existing vocabulary can be used, or if it is necessary to develop a new one. It shall also see how a vocabulary can be integrated into BIBSYS. The group shall look at alternative solutions and the consequences they present for the BIBSYS system.

The role of the working group was to recommend a solution. It would then be up to the users and BIBSYS to take the final decision. BIBSYS agreed that it would contribute to the technical solution and take responsibility for the system, but that it was up to the libraries concerned to develop a thesaurus if this were necessary.

Criteria

The group set up the criteria for a thesaurus:
- Language. The thesaurus should preferably be in Norwegian. The second choice is English.
- Subject fields. It should be confined to health subjects, and not cover other fields in the multidisciplinary library. It should cover both health subjects and medicine or many relevant fields would be missing. The thesaurus should also cover the needs of hospital libraries and patient/consumer information.
- Technical solutions. The thesaurus should have its own authority list in the subject module of BIBSYS. It should have its own MARC field and search field in BIBSYS.

Survey of present practice

Questionnaire survey

A postal questionnaire was sent to 37 libraries. These included all BIBSYS libraries that serve health care students or health care professionals and three large hospitals (non-BIBSYS libraries). Replies were received from 25 college libraries, seven university libraries and one hospital library. The reply response was 89%. The questionnaire and a summary of the results can be seen in Appendix 1.

The aim of the questionnaire survey was to confirm assumptions about the use of uncontrolled terms in BIBSYS, to survey the use of MeSH (Medical Subject Headings) [1] and to investigate the interest for a Norwegian thesaurus.

Table 1   Use of synonyms.

Term	Frequency
atferdsvansker	102
atferdsproblemer	11
atferdsproblem	24
adferdproblemer	3
behaviour	154

The survey showed that:
- Most libraries used uncontrolled terms, sometimes in combination with MeSH or other controlled vocabularies. All who used uncontrolled terms in BIBSYS placed them in the MARC field 691.
- The use of MeSH was most prevalent in the university libraries. Only three of the 25 college libraries that answered the questionnaire used MeSH. The main commentary was language problems for the users.
- Most were unsatisfied or partly satisfied with present practice. The universities were most satisfied.
- Of those who where familiar with MeSH, 63% were satisfied with coverage in allied health fields and 33% with coverage of social welfare.
- Almost all agreed that it is an advantage to have Norwegian terms.
- More than 51% would use a Norwegian thesaurus if it were available, while 33% were unsure. The college libraries were most positive.

The conclusion drawn by the working group was that there is interest for a Norwegian thesaurus, but the results of the questionnaire survey are rather vague. It is possible that there would have been more interest if the group had presented a specific proposal, but it was considered too early in the process to do so. The survey did confirm, however, the working group's assumptions on the use of uncontrolled terms and the inadequacies of MeSH in relation to health and social welfare subjects.

Survey of MARC field 691

A list of uncontrolled terms from the 691 MARC field for the libraries with medical and health care collections was made. This resulted in a list of 42 000 terms. Because many of these libraries are multidisciplinary, it was reckoned that about half this number are related to medicine and health care. Approximately 23 000 of the terms were only used once, and many were only used a few times. This shows that the use of uncontrolled terms is very imprecise, and that there is a need for a thesaurus.

Experience from other countries

The working group looked at the experience with medical and health sciences thesauri in other countries.

Sweden

Sweden has a number of medical and health care databases that have their own thesaurus:
- SWEMED a Swedish version of MEDLINE. MeSH translated into Swedish. [2]
- SPRILINE nonclinical aspects of medicine and health care. SPRILINE has its own thesaurus with Swedish terms linked to MeSH. [3]
- ARBLINE: occupational health thesaurus with Swedish and English terms. [4]
- PATRIX:: patient/consumer information with a list of keywords in Swedish. [5]

In the present Swedish translation of MeSH, 15 709 terms out of 19 636 terms have been translated.

USA

The UMLS project (Unified Medical Library System)[6] at the National Library of Medicine aims to 'to aid the development of systems that help health professionals and researchers retrieve and integrate electronic biomedical information from a variety of sources and to make it easy for users to link disparate information systems …'.

The database CINAHL (Cumulative Index to Nursing and Allied Health) [7] has its own subject headings list which is closely related to MeSH.

MeSH translations

MeSH has been translated into Czechoslovakian, French, German, Portuguese, Finish, Spanish, Swedish and many other languages.

Survey of suitable vocabularies

The working group considered the following thesauri/subject heading lists for inclusion in a survey of suitable vocabularies:

1 local list Akershus Central Hospital (Lokal emneordsliste. Norbyhagen: Sentralsykehuset i Akershus, unpublished),

2 HelseNota, [8]

3 Biblioteksentralen's Norwegian subject headings list, [9]

4 Nordic Multilingual Thesaurus on Health Promotion, [10]

5 Spriline Thesaurus, [3]

6 MeSH, [1]
7 CINAHL Subject Headings List, [7]
8 AMED/CATS, [11]
9 RCN Library Thesaurus of Nursing Terms, [12]
10 Bioethics Thesaurus. [13]

The three Norwegian subject heading lists (nos. 1–3) were assessed as being unsuitable. All were too general in coverage and Akershus Central Hospital's and HelseNota's lists are no longer maintained. The AMED/CATS thesaurus and RCN Library Thesaurus of Nursing Terms were not available to the group at the time of the survey. The Bioethics Thesaurus covers mainly medical ethics and was therefore not reviewed.

The following thesauri/subject heading lists were reviewed:

Nordic Multilingual Thesaurus on Health Promotion (c. 1300 terms) .[10] This thesaurus is part of a European Commission funded project. English is the source language. Terms have mainly been directly translated to the Scandinavian languages without adding new terms. The original English list had few relations between terms, so the translators have made a macrostructure where terms are grouped according to subject.

Spriline Thesaurus (c. 1400 terms). [3] The Spriline database covers nonclinical aspects of medicine and health care. The thesaurus is built up of an alphabetical and hierarchical list of terms, and has a list of categories. It also contains an alphabetical list showing the appropriate MeSH term or terms. Spriline tesaurus is expected be incorporated into Swedish MeSH in year 2000.

MeSH (c. 19 000 terms). [1] Medical Subject Headings (MeSH) mainly covers clinical medicine, but also has a good coverage of biomedicine, pharmaceuticals, chemistry, nursing, etc. The National Library of Medicine (NLM) has responsibility for keeping the thesaurus up-to-date, and it has become a standard in medical terminology. It is used for classifying, indexing and searching the medical literature in the whole world. MeSH has a standard structure where terms are clearly defined within a hierarchy. It is mainly adapted to American conditions.

MeSH has mostly been used by the university medical libraries in Norway, but is little used by college libraries. MeSH was incorporated into BIBSYS in 1998.

CINAHL Subject Heading List (c. 10 000 terms). [7] The American database CINAHL (Cumulative Index of Nursing and Allied Health Literature) covers literature on nursing and 18 related fields. Its subject heading list is partly based on MeSH. About 70% of its terms overlap with MeSH and it has a similar structure.

Evaluation

Each thesaurus was evaluated using a list of 17 subject areas related to nursing. The coverage and the use of terminology was checked in relation to the general practice of user groups in the field of health care (Table 2).

The results of the survey are shown in Table 3.

Conclusion

There is no thesaurus that is entirely suitable as a basis for a Norwegian health care thesaurus in BIBSYS, but CINAHL Subject Heading List [7] comes closest with its wide coverage of health care terms. Both MeSH [1] and CINAHL are updated yearly, which is an advantage.

It may be necessary to adopt subject headings from other thesauri, such as those of Bioethics Line, [13] AMED/CATS [11] and the Royal College of Nursing Library, [12] in the construction of a Norwegian thesaurus.

Why MeSH?

- MeSH is an internationally recognized standard.
- MeSH is updated regularly.
- MeSH is widely used in Norwegian university medical libraries, and therefore in BIBSYS.
- A Norwegian thesaurus based on MeSH can be mapped to English MeSH through the UMLS project.
- NLM is developing software for translating MeSH, which allows the addition of non-MeSH terms.
- There are no copyright problems involved in translating MeSH.
- Lessons can be learned from the experience of translating MeSH in the neighbouring countries of Sweden and Finland.

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Table 2 Subject areas related to nursing.

1.	Anatomy
2.	Physiological processes, nutrition
3.	Genetics
4.	Hygiene, environment, safety
5.	Human activities, self care
6.	Diseases, injuries, handicaps, accidents (including diseases and their treatment)
7.	Pharmaceutics, chemical substances, toxicology
8.	Medical techniques/technology, laboratory testing
9.	Behavioural subjects (psychology, psychiatry)
10.	Organization, management, administration, health services, economy
11.	Social sciences (anthropology, sociology, history, philosophy, ethics, etc.)
12.	Teaching
13.	Nursing theories
14.	Work settings (hospitals, nursing homes, community, etc.), special fields (psychiatric nursing, geriatric nursing, etc.)
15.	Professional groups, persons, age groups
16.	Information, documentation, IT, research, quality control, scientific theory
17.	Sundry topics

Table 3 Results of the survey of suitable vocabularies.

Name	Language	Advantages	Disadvantages
Nordic Multilingual Thesaurus forHealth Promotion and Education	English, Norwegian, Swedish, Danish, Finnish	Covers some nursing areas well.	Too narrow subject field. Poor coverage of subject. Areas 1, 8, 11 and partly 4.
Spriline Thesaurus	Swedish	Terms linked to MeSH if MeSH term exists	Too narrow subject field. Poor coverage of subject. Areas 1, 2, 3, 5, 9 and 11. Will not be maintained in present form.
MeSH	English	International standard. Updated regularly. Good starting point for a national thesaurus.	Lacks coverage in health care subjects. Poor coverage in social welfare subjects. US bias.
CINAHL Subject Headings List	English	Covers all 17 subject areas. Terms are compatible with Norwegian terminology. Updated regularly.	US bias.

- A Norwegian thesaurus based on MeSH and mapped to MeSH could be used for indexing electronic literature on the Internet.

Why CINAHL?

- CINAHL has a good coverage of nursing and allied health terms.
- CINAHLis closely linked to MeSH, with the same structure and approximately 70% common terms.
- CINAHLis updated regularly.

Main recommendations

The working group presented its main recommendations in its report in October 1999. [14]

None of the vocabularies evaluated by the working group can be used as they stand. It is therefore necessary to develop a new thesaurus. The working group proposed that this should be based on MeSH [1] and CINAHL Subject Heading List. [7] The most relevant terms from these two thesauri should be translated into Norwegian, and terms specific

to Norwegian conditions should be added. The starting point for the Swedish translation of MeSH [2] was the MeSH terms used in the Swedish database SWEMED. In the first phase of the Swedish translation of MeSH only 8000 terms were translated, i.e. MeSH terms used more than 10 times in SWEMED. SWEMED covers mainly medical journal articles that are indexed more in depth than monographs. The working group concluded that it is not necessary to translate the whole of MeSH and CINAHL Subject Heading List, but only the most frequently used terms, i.e. ≈ 8000 terms.

The thesaurus should cover both medicine and health care because it is difficult to separate these two fields. Thus, the working group extended its original mandate, and proposed that the thesaurus should be called the 'Norwegian Thesaurus for Medicine and Health Care'.

The thesaurus should have its own authority file in the subject module of BIBSYS. It should also have its own MARC field in the cataloguing and search modules. This is technically feasible in BIBSYS.

The construction of the thesaurus demands a great deal of resources. The working group recommended that it should be done as a project financed by grants and external funding. The University of Oslo Library, Library of Medicine and Health Sciences (UMH), which is the national resource library for medicine and health care, should take responsibility for the thesaurus and lead the construction work. The working group submitted a project plan proposal with its report (Appendix 2).

The process after the working group presented its recommendations

The report of the working group and its recommendations were well received by the BIBSYS board and council, and by user groups.

The University of Oslo Library, Library of Medicine and Health Sciences (UMH) has agreed to act as project co-ordinator for a Norwegian thesaurus for medicine and health care. UMH has sought financial support from a variety of bodies, but has to date (October 2000) not succeeded in financing the project. If external financial support is not received UMH will, depending on support from the Faculty of Medicine at Oslo University in

particular, consider reallocating internal resources in order to start the project.

The Faculty of Medicine Oslo University is in the process of building a database for digital teaching media. It has contacted UMH and has expressed a need for a national thesaurus for indexing the digital teaching media. It is hoped that the faculty will support the thesaurus project by contributing towards its work. The Faculty of Medicine, University of Trondheim is also in the process of constructing a database, and has expressed a need for a Norwegian thesaurus.

BIBSYS has agreed to support the project with its expertise in thesaurus construction and assist the project technically.

The thesaurus will be an integrated part of the national library system BIBSYS. In addition, a management system will be needed for administrating the thesaurus and keeping a close link with MeSH and CINAHL. The National Library of Medicine, USA (NLM) is planning to develop an interlingual database of MeSH translations. [15] This interlingual database will guarantee a close link to MeSH and will be used to develop and maintain the Norwegian thesaurus for medicine and health care.

Conclusion

A Norwegian thesaurus for medicine and health care will enable users to find medical and health care literature in the joint library catalogue BIBSYS more easily, and with a consistency and certainty that is currently lacking because of the present system of indexing—a mixture of different systems and uncontrolled terms. The working group has documented that there is a great need and interest in Norway for a Norwegian thesaurus for medicine and health care. With support from national partners and the NLM, the new thesaurus will be a valuable tool for improving the dissemination of information within medicine and health care in Norway.

References

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2 Swedish MeSH . Stockholm: Karolinska Institutet. Available from <http://mesh.kib.ki.se/swemesh/swemesh.cfm>.

3 Tesaurus för Spriline , 6th edn. Stockholm: Spris förlag, 1997.

4 Arbline tesaurus. Solna: Arbetsmiljöbiblioteket, 1994.

5 Patrix nyckelordlista . Stockholm: Spri, 1996.

6 Unified Medical Language System (UMLS) . Bethesda, MD: National Library of Medicine. Available from URL: <http://www.nlm.nih.gov/research/umls/umlsmain.html>.

7 CINAHL . Subject Heading List . Glendale, Calif.: CINAHL Information Systems, 1999.

8 Helse-Nota: bibliografi over artikler i norske helse- og sosialtidsskrifter. årskatalog . Oslo: Universitetsbiblioteket, 1997.

9 Biblioteksentralen. Norske emneord. Oslo: Biblioteksent-ralen, 1996.

10 Nordic Multilingual Thesaurus on Health Promotion: English — Danish — Finnish — Norwegian — Swedish . Stockholm: Spri Library, 1999.

11 AMED/CATS Thesaurus: Alphabetical and Structural Hierarchical List of the 2,500 Headings Used to Index the Current Awareness Topic Services/Allied and Alternative Medicine Database: 1998 . London: British Library, 1998.

12 RCN Library Thesaurus of Nursing Terms 1998 , 3rd edn. London: Royal College of Nursing, 1998.

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Appendix 1. Results of the questionnaire survey

The questionnaire was sent to BIBSYS libraries at the university medical faculties, university hospitals, the national university colleges, private health and social studies colleges, and three large hospitals (non-BIBSYS).

Response

Questionnaires sent:	37
R eplies:	33

At institutions that had more than one library unit covering medicine or health and social studies, two sent in separate answers for each unit (three libraries in each case) and three chose to send a joint answer. Five libraries were not able to answer for various reasons. Four libraries had amalgam - ated with two of the libraries which answered.

Abbreviations
COL University college library
UNIV University library (faculty library or university hospital library or combination)
HOSP Hospital library

Questions with summary of answers

1 What is the current practice in indexing health and social welfare literature in your library?

Type	Number	Spread
Uncontrolled terms	25	COL 20, UNIV 5
MeSH	9	COL 3, UNIV 5, HOSP 1
Spriline Thesaurus	0	
Other published thesauri:		
Biblioteksentralen	7	COL 7
Dewey	2	COL 2
Psychological Index	1	UNIV 1
Humord (Humanities)	1	UNIV 1
UDK	1	COL 1
Local thesaurus/word list	4	COL 4
Other	0	

2 For BIBSYS libraries only—which MARC field is used in BIBSYS for registering subject headings (691, 660, 687, etc.)?

Uncontrolled terms	691	26
M eSH	660	6
Local terms	687	6
Humord	698	1

3 If the library covers other subject fields than health or social studies, is the thesaurus/word list used for these subjects?
Yes: 10 (COL 7, UNIV 3)

Subject area	Thesaurus
Education, journalism	Local word list
Technical subjects	University of Trondheim's word list
General literature	Biblioteksentralen's word list
Psychology, education, law, administration	Biblioteksentralen's word list
Education	Humord
Christian nursing and social work	Biblioteksentralen's word list
Theology	Dewey
Medicine, pharmacology	MeSH
Philosophy, psychology, sociology, language, literature	Dewey

4 Is the library satisfied with the current practice in indexing health and social welfare literature?

Yes	No	Partly	No answer
6	8	18	1
COL 4	COL 8	COL 13	HOSP 1
UNIV 2		UNIV 5	

Comments:
Yes
• Have many subject fields— cannot give health subjects special consideration.
No
• Feel the need for a good thesaurus.
• Language is a problem (with MeSH).

- University of Trondheim's list (technical subjects) is not suitable for health subjects.
- Cumbersome and poor (uncontrolled terms).
- Inconsequent and unstructured in relation to subject searching in BIBSYS (uncontrolled terms).

Partly

- Impractical with different systems—must have the same as the main library.
- Would prefer a Norwegian thesaurus.
- Biblioteksentralen's list is far too general for health and social studies.
- The students prefer Norwegian terms, but the health studies library is part of a medical library—most practical with MeSH.
- Psychology students are used to English terms, but it is an advantage with Norwegian terms for student teachers.
- Want more standardized terms for nursing literature.
- Nursing students have problems retrieving literature (MeSH).
- Cumbersome and difficult for teachers and students to use MeSH.

5 For libraries that use/have used MeSH: Do you think that MeSH is satisfactory in the indexing of: Health sciences

Yes	No	Perhaps	Don't know
8	3	1	0
COL 3	COL 2	COL 1	
UNIV 4	UNIV 1		
HOSP 1			

Social welfare

Yes	No	Don't know
4	7	1
COL 1	COL 4	COL 1
UNIV 4	UNIV 2	
	HOSP 1	

Which subject areas are lacking or are insufficiently covered?
- psychology,
- psychiatry,
- sociology,
- education,
- administration and leadership,

- nursing in areas which are not purely medically orientated,
- health and social welfare systems,
- physiotherapy,
- new terms, e.g. services to the mentally handicapped, home care, narrative therapy.

Other comments about MeSH?
- not suitable for non-US conditions,
- too general, difficult to find a precise term,
- difficult for users to translate,
- long delays in using new terms.

6 It is an advantage for users that terms are in Norwegian. Do you agree with this statement?

Yes	No	Partly
24	1	8
COL 22		COL 3
UNIV 2	UNIV 1	UNIV 4
		HOSP 1

7 If there was a Norwegian thesaurus for health sciences (and possibly for social welfare), would your library use it?

Yes	No	Perhaps
19	1	12
COL 19	COL 1	COL 5
		UNIV 7

Appendix 2. Project plan proposal

Summary of the main points.

Aims

The aim of the project is to help end users in medical and health care libraries to satisfy their information needs by improving access to information and removing practical problems for the user.
   The potential users are:
- all health care workers,
- students and academic staff of universities and colleges,
- decision makers,
- patients and their families,
- libraries in medicine and health care.

Project structure

The project is expected to take about 18 months. The development of the thesaurus for medicine and health care will be done by a working group of two experts in the field of thesaurus construction in medicine and health care. The working group will work closely with a reference group consisting of representatives from the various medical and health care libraries in Norway and with terminology experts.

Plan of activities

Phase 1:
- project start and analysis of the working group's mandate (2 months);
- elucidate the mandate;
- make a survey of relevant thesaurus projects and their experiences;
- construct a detailed project plan;
- establish the reference group;
- establish the technical infrastructure of the project in co-operation with the UMLS project and BIBSYS;
- import MeSH, CINAHL Subject Heading List and Swedish MeSH to a local server;
- prepare an action plan for the division of responsibilities in the development and maintenance of the thesaurus.

Phase 2:
- construction of the first draft of the thesaurus (7 months);
- the most frequently used MeSH terms and uncontrolled terms will be translated in the first part of the project. The first draft will be made accessible through BIBSYS by the end of Phase 2, and the technical link-up to the UMLS project will have been tested.

Phase 3:
- Norwegian Thesaurus for Medicine and Health Care. First version (10 months);

- the first version of the thesaurus will include c. 8000 terms. All the terms will have been quality-controlled by the reference group. The thesaurus will be accessible through BIBSYS and through the Website of the University of Oslo Library, Library of Medicine and Health Sciences (UMH), and it will be a part of the UMLS metathesaurus at NLM.

Project organization and budget

- The project should be organized as a matrix organization, based at UMH, with a project leader, a working group of two and a reference group;
- the total costs of the project are estimated to be NOK 1106 000.
- it is estimated that it will be necessary to use a 30% post in the future maintenance of the thesaurus;
- funding should be sought from various sources, including RBT, the University of Oslo, the Ministry of Health and Social Services, the Ministry of Education, Research and Church Affairs, and from professional bodies such as the Norwegian Medical Association, the Norwegian Nurses' Association, etc.

Termination of the project

- At the end of the project it important that the results are made known to users and other interested parties.
- It is also important that the thesaurus is used by BIBSYS libraries. This can be achieved by bilateral agreements with the BIBSYS libraries concerned. The further responsibility for the maintenance and development of the thesaurus must be decided.
- There should be an evaluation of the project, the pilot period and the cost-effectiveness after a running period of 2 years.