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Subject Cataloging in a Cooperative Cataloging Environment

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Chapter 16
Subject Cataloging in a Cooperative Cataloging Environment

A Case Study

Klára Koltay

The present study discusses particular issues in the area of subject access in a cooperative cataloging environment, and uses as examples three cooperative databases in Hungary: the bibliographic databases of the Hungarian National Shared Catalog (MOKKA) (http://www.mokka.hu),[1] the location database of the National Document Delivery System (ODR) (http://odr.lib.klte.hu), based on the cooperative cataloging program of the Corvina libraries (VOCAL),[2] and the Matriksz database (http://www.matriksz.hu), which consists of three subject heading systems used in Hungary and Universal Decimal Classification number records.

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[1] Géza Bakonyi, "Mi a MOKKA?" (What is Mokka?), *Könyvtári Levelezölap*, 10 (1998): 3–5.

[2] Klára Koltay, "VOCAL—a model for union catalog," *Research Libraries: Cooperation in Automation*, eds. Jadwiga Wozniak and Robert C. Miller (Cracow, November 16–19, 1998: 151–156); Géza Bakonyi, "VOCAL—a Corvina könyvtárak osztott katalogizálási rendszere" (VOCAL—the distributed cataloging system of the Corvina libraries), *Könyvtári Figyelő*, 45 (1999), http://www.oszk.hu/kiadvany/kf/1999/2/bakonyi_h.html; László Balázs and Klára Koltay, "Lelőhelyszolgáltatás osztott katalogizálási bázison" (Location database based on cooperative cataloging), paper presented at Networkshop, 1999, Nyiregyháza, http://www.iif.hu/rendezvenyek/networkshop/99/cdrom/docs.htm.

1 Problems of Subject Access in Cooperative Cataloging Databases

When cooperative cataloging systems start to operate, one of the possible complications is the handling of the various thesauri and subject heading systems used in the cooperating libraries. The complications become real problems to be solved if a cooperative cataloging system not only aims at providing a common pool of bibliographic records for copy cataloging, but also aspires to be open for public use as the common catalog of several libraries or a location database for inter-library loan and document delivery systems.

The problem is especially complicated in Hungary, since for decades the preferred subject access tool of most Hungarian libraries has been the Universal Decimal Classification system, and a comprehensive Hungarian vocabulary has not been developed. The present situation is that nearly all libraries use UDC strings in their catalog records and databases, while only a portion of them add natural language subject terms. Those that use subject headings either employ some in-house system of various levels of vocabulary control or a thesaurus of a limited subject area (Table 1).

Table 1. Usage of Classification Systems

	Number of participating local catalogs (July, 2002)	Number of libraries using				
		UDC*	Other classification systems	Local subject terms	LCSH ** (English and/or Hungarian)	MeSH ***
MOKKA	16	11	1	10	2	2
ODR	11	10	-	7	2	1

* Universal Decimal Classification

** Library of Congress Subject Headings

*** Medical Subject Headings

A plausible way of handling the various types of subject information provided by local catalogs is to enter them in the relevant union database records without paying too much attention to the existence of the various heading systems, and to use the natural language terms as one set of uncontrolled subject keywords and the UDC strings as the basis for classification number searches.

Both MOKKA and ODR, the bibliographic databases of our study, have chosen the above approach: the MARC bibliographic records contain all relevant locations, subject terms and UDC strings added to it in various libraries (Table 2). The subject heading fields may contain coded references to their system of origin. One slight philosophical difference is that the MOKKA database, being consistent with the compromise already made, does not undertake to store the reference systems of the various subject schemes and uses only skeleton authority records in the case of subject fields. On the other hand, the VOCAL database uses the original, full-subject authority records of the member libraries, in the hope that the reference information in them will enhance the accuracy of subject browse searches even in a mixed subject environment.

Table 2. A Typical ODR Record with UDC Strings, Subject Terms and Location Information[3]

```
000 01156nam 2200241 i 4504
001 bibFSZ724579
005 20020723154313.0
008 s2002 hu 0 hun d
020 $a963-9376-46-9 (kötött)
040 $aHuBpFSZEK$dSzl/91$dHuDeKLEK
080 0 $a931(089.3)
080 0 $a930.85(3)
080 $a930.85(3)(089.3)$a931(089.3)
```

[3] UDC strings are 080 fields, subject terms are 650/651/695 fields, and location information is 949 fields. The various subject schemes present are defined by the indicators of the subject fields.

```
100 1 $aNémeth György$d(1956-)$c(történész)
245 10 $aKarthágó és a só :$baz ókortörténet babonái
/$cNémeth György
260 $aBudapest :$bKorona,$c2002
300 $a215 p. :$bill. ;$c24 cm
504 $aBibliogr.: p. 206-215. és a jegyzetekben p. 201-205.
520 $a"Mindenki úgy tudja ..., hogy Karthágót a rómaiak
        porig rombolták, majd a helyét sóval behintették, hogy
        Drákón hírhedetten kegyetlen törvényeket hozott ... és
        hogy Attilát hármas koporsóban temették el a Tisza
        medrében. És mindenki rosszul tudja!"
650 4 $aTörténet, ókori$xtévedések, koholmányok stb.
650 0 $aHistory, Ancient$xErros, inventions, etc.
650 7 $aMűvelődéstörténet$y ókor$xkuriózumok
650 7 $aKuriózumok$xókori
949 $1D1/CA
949 $1D1
949 $1Sz1
949 $1Sz1/91
949 $1Sz4/K2
949 $1Sz4/F2
949 $1D1/0R
949 $1B10/X
949 $1Sze1
```

Despite the fact that the information is present in the records (coded with the help of indicators or source subfields in the subject fields), the retrieval mechanism of databases disregards the origin of subject terms in both keyword and browse subject searches. The keyword search strategy we employ must be the one we would use in an uncontrolled subject keyword environment in which a concept can be described in different ways, where various synonyms and endings can appear and a set of records does not contain subject terms at all.

2 Search 1

The results of a test search for the concept of deviant behavior, given in Table 3 below, proves the dominance of UDC strings as a subject access tool in both databases, which are probably not very often used by online searchers. The possible subject terms, on the other hand, can vary considerably within a database.

Table 3. Subject and UDC Search Results in Some Union and Individual Library Catalogs

Search term	Index	Number of records in			
		MOKKA	ODR	DEENK*	SZTEEK**
316624%	UDC	132	256	26	-
34395%	UDC	79	123	8	-
deviancia	Subject	98	87	4	4
	Subject or title	126	137	12	-
Deviáns viselkedés	Subject	15	76	11	6
	Subject or title	20	85	12	-
Aszociális viselkedés	Subject	0	1	0	0
	Subject or title	0	1	0	-
Beilleszkedés i zavarok	Subject	21	23	3	32
	Subject or title	21	23	14	-
Bűnözés	Subject	245	467	53	83
	Subject or title	398	673	95	-

Search term	Index	MOKKA	ODR	DEENK*	SZTEEK**
Bűnözői viselkedés	Subject	2	4	2	0
	Subject or title	2	4	4	-
Antiszociális viselkedés	Subject	0	3	1	-
	Subject or title	0	4	2	-
UDC 316624% or subject *deviancia* or title *deviancia*		245	332	33	-

* Debrecen University Library

** Szeged University Library

A few plausible ones used in the test searches, the selection of which depends entirely on the searchers' creativity and foreknowledge of the subject schemes of the databases, came up with increasingly new results. It is only if we try to construct a more composite search, which is again highly unlikely to happen with lay users, that a fuller result emerges (Table 3.).

Though the subject access provided in this way may seem sufficient when our aim is only to find a few titles on a certain subject, it can seldom give a comprehensive result and cannot help users with all the guidelines that are built in the reference system of thesauri and controlled subject heading systems.

3 Subject Databases

However, the information present in the databases and the subject authority records allows us to complement the subject access method described above with a more sophisticated one, which preserves the integrity of each vocabulary for those who want to make use of their reference system, and creates parallelisms among the terms used for the same concept in the various vocabularies for the users who want to search across them.

After some technical experiments conducted separately at the National Széchényi Library, with its thesaurus database, and in the Szeged and Debrecen University Libraries, with a subject heading database attached to the VOCAL cooperative cataloging system,[4] a consortium of the National Széchényi Library, Szeged University Library, Debrecen University Library, the Kaposvár County Library and the Library Institute was founded in 2001 to address the above problem and to offer a service which, even in the absence of a single, generally-used subject heading system, can give guidance both for subject catalogers and for searchers nationally.

The first phase of the project, called Matriksz, was completed in March, 2002 and concentrated on working out the technical framework using the thesaurus of the National Széchényi Library, the Szeged subject headings, the Library of Congress Subject Headings, translated into Hungarian at the Debrecen University Library, and the UDC index tables, translated by the Library Institute. The Matriksz database is currently available for real-life tests.

In its present state, the Matriksz service consists of a fully searchable database of subject headings and classification numbers stored in MARC format records, displaying and allowing navigation according to the reference structure of headings, and maintaining parallelisms among the heading systems and between the headings and UDC strings. In Figure 1, the left-hand panel shows the integrated list of results from the four resource subject schemes. The sources of terms and classification numbers are indicated in brackets with index numbers referring to the number of existing term and subdivision combinations. In the case of "*Deviáns magatartás és szubkultúra*" (deviant behavior and subculture), the two combinations of terms and geographical subdivisions are displayed. The right-hand panel shows the selected item of the result list in full display. All references and equivalent terms and UDC numbers are points of further navigation. They are links, activated by clicking to make the system perform another search with the selected term and display its environment.

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[4] Klára Koltay, "Az ODR adatbázis új szolgáltatásai,"(New services by the ODR database), *Tudományos és Műszaki Tájékoztatás*, 48/8(2001): 315–321. The database (with the nickname termdb) is accessible at http://vocal.lib.klte.hu/corvina/opac/term_search.

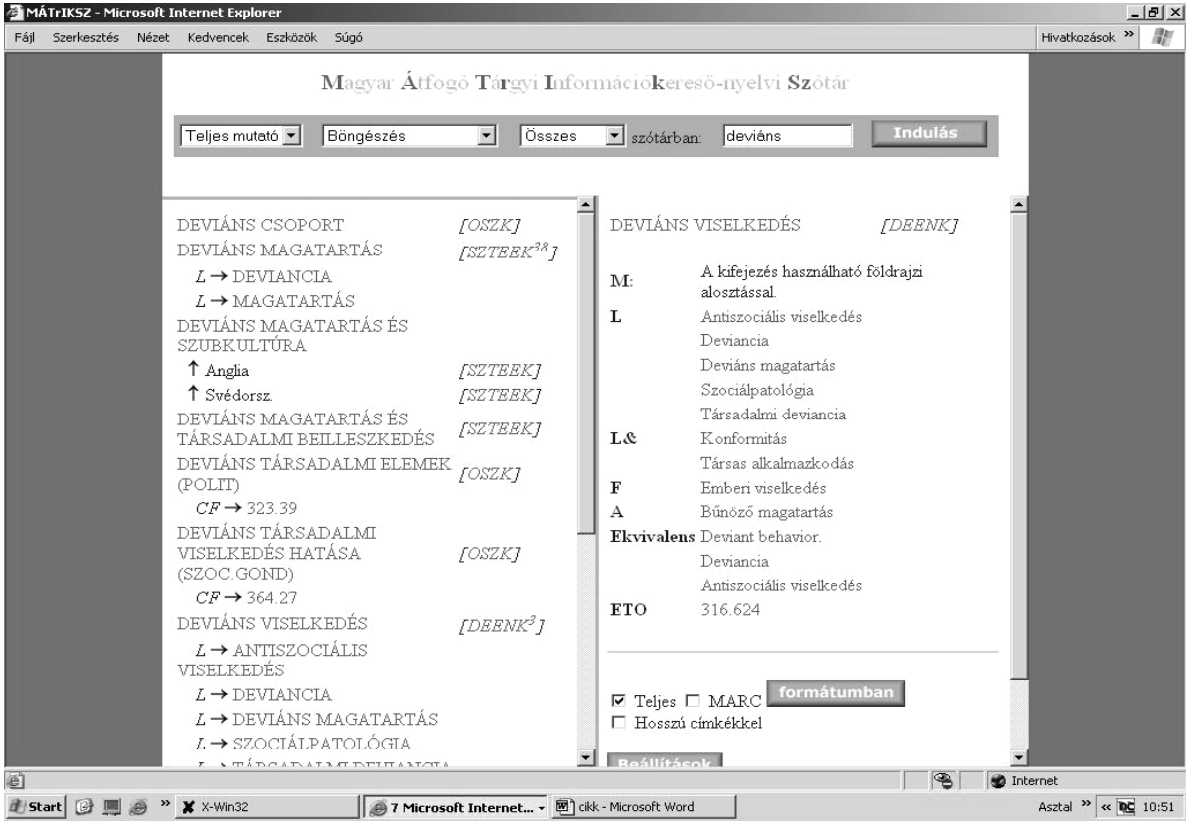

Figure 1. The Result Screen of the Browse Search "*deviáns*"

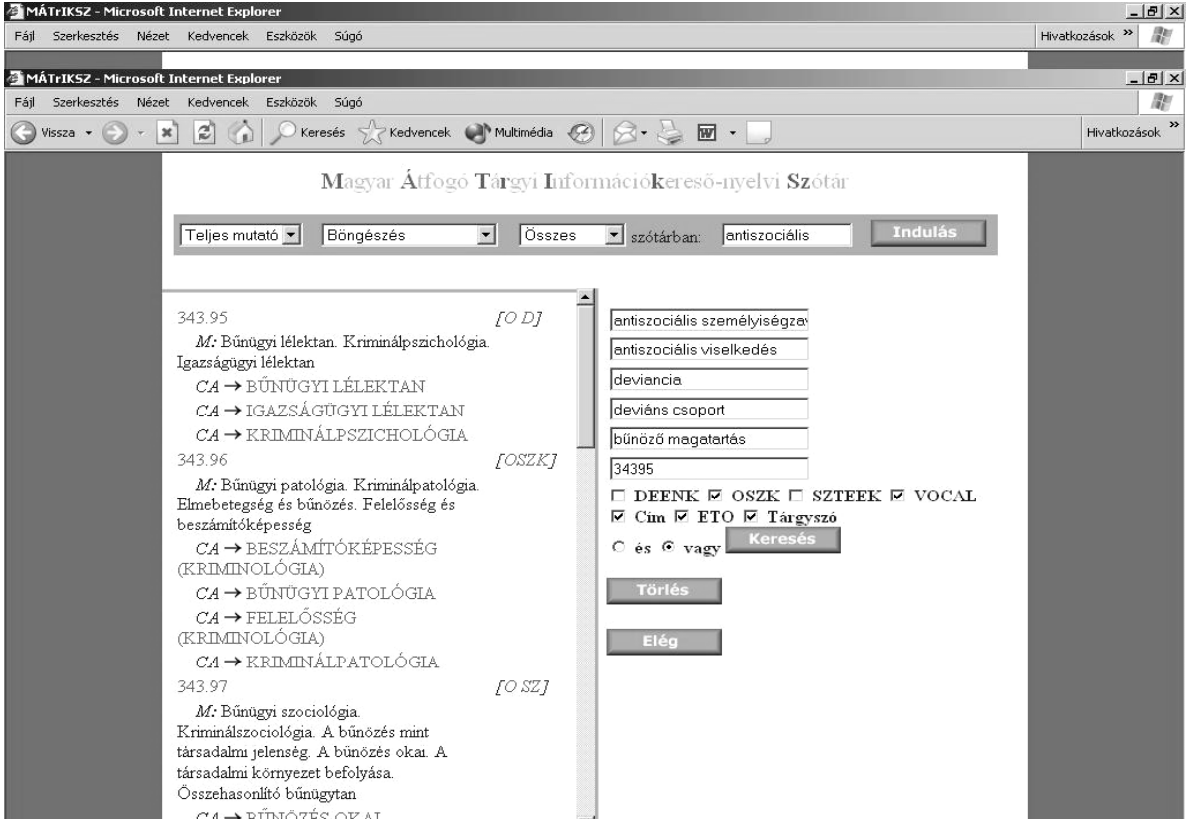

Figure 2. More Results from Browse Search

Following these links, users navigate through a chain of terms related in one way or another to their concept of interest and can pick the ones they feel are more relevant to their present needs. Thus, the Matriksz database allows users to select the 'proper subject terms' before they start their subject query in bibliographic databases.

The second element of the service offers a number of bibliographic databases that can be searched with the selected subject terms one by one or collectively. In Figure 2, the left-hand panel again shows a segment of the result list, while on the right some of the terms and UDC numbers that might be relevant for a bibliographic search in our selected subject area are already collected. One or several of the target bibliographic databases can be selected, as well as the types of searches (title and/or UDC and/or subject) we intend to perform.

Table 4. a. Debrecen record; b. Szeged record; c. OSZK record; d. UDC record

```
07599nz 2200265n 4504
001 autKLT00204617
005 20020730132045.0
008 971218nn acnnnbabn un aaa d
040 $aHuDeKLEK
080 $a316.624
150 4 $aDeviáns viselkedés
450 4 $aAntiszociális viselkedés
450 4 $aDeviancia
450 4 $aDeviáns magatartás
450 4 $aSzociálpatológia
450 4 $aTársadalmi deviancia
550 4 $wh$aBűnöző magatartás
550 4 $aKonformitás
550 4 $aTársas alkalmazkodás
550 4 $wg$aEmberi viselkedés
680 $aA kifejezés használható földrajzi alosztással.
690 $xJE, OSZK
750 0 $aDeviant behavior.
```

```
750 7 $aDeviancia$20SZK
750 7 $aAntiszociális viselkedés$20SZK
a./

00339nz 2200145n 4504
001 autJAT00331084
005 20020304082332.0
008 970411nn acnnnbabn un aaa d
040 $aJ
080 $a316.624
150 7 $aDeviáns magatartás
450 7 $aDeviancia
450 7 $aMagatartás$xdeviáns
690 $ags$x0SZK
750 7 $aDeviancia$20SZK
b./

DEVIANCIA
000 00733nz  2200277n  4500
001 0SZK000000053331
005 20020514235905.0
008 020514 b an                n a a
040    $a0SZK$bHU
150    $adeviancia
154    $a316.624
450    $wy$aantiszociális viselkedés
450    $wy$adeviáns viselkedés
550    $wg$abeilleszkedési zavar
550    $wf$alélektan
550    $wf$aszociálpatológia
550    $wp$aalkoholizmus
550    $wp$abűnözés
550    $wp$akábítószer
```

```
550    $wp$aprostitúció
550    $wp$aszkinhed
550    $wr$acsoportszociológia
550    $wm$adeviáns csoport
550    $wm$aerkölcs
550    $wm$afiatalkorú
550    $wm$aszocializáció
c./


000 00230nz   2200097n  4500
001 0SZKm0027508
005 20021009235905.0
008 021009 b an                    a a     d
040    $a0SZK$bhu
080    $a316.624
150    $aszociálpatológia (szoc)
d./
```

The UDC strings are integrated into the system in two ways. The Debrecen subject heading records contain parallel UDC numbers that can act as points of further navigation in the database (Table 4a). At the same time, the index of the UDC's medium edition is entered in the form of classification number records containing the numbers and their definition (Table 4d).

Being a MARC database, it can be indexed according to various rules in a flexible way. The present Matriksz database and its predecessor, the VOCAL subject database nicknamed termdb, represent two different approaches.

Termdb uses one big keyword index containing the headings (field 150) and all the references (fields 450, 550, 750) and notes (field 680) in its default search. It gives maximum guidance to users who do not really know which terms are the accepted headings, though it sometimes returns too many hits to be really helpful.

The Matriksz database indexes only the heading field (150), and the references appearing in the displayed record serve only as points of further navigation. This way, the search results always seem more manageable, although if our search term is only a 'see' reference we might miss important results to start with.

4 Search 2

In Search 2, the task is to use the subject databases for collecting as many relevant terms as possible to describe the subject area of 'antisocial, deviant behavior' of Search 1. In order to find out if there are any real differences due to the different indexing rules, the searches are carried out in both termdb and Matriksz. (Note that the Matriksz database is richer in context, and termdb does not contain the OSZK thesaurus or the OSZK UDC classification records.) Only the harvested terms are listed here.

Table 5. Terms Collected in termdb[5]

316.624
349.95
Antinomikus személyisé (antinomian personality)
Antisocial personality disorders
Antiszociális személyiségzavarok -- nevelés
Antiszociális személyiségzavarok (antisocial personality disorders)
Antiszociális viselkedés (antisocial behaviour)
Bűnözés (crime)
Bűnöző magatartás (criminal behaviour)
Bűnözői viselkedés (criminal behaviour)
Deviancia (deviancy)

[5] Terms collected through three searches and by consulting the full records displays.

Deviáns magatartás	(deviant behaviour)
Deviáns viselkedés	(deviant behaviour)
Emberi viselkedés	**(human behaviour)**
Ifjúságszociológia -- deviáns magatartás	**(sociology of young people - deviant behaviour)**
Konformitás	**(conformity)**
Önmegsemmisítő magatartás	**(self-distructive behaviour)**
Pszichopatologikus személyiség	(psychopathic personality)
Személyiségzavarok	(personality disorders)
Szociálpatológia	(social pathology)
Szociopatologikus személyiség	(sociopathic personality)
Társadalmi deviancia	(social deviancy)
Társas alkalmazkodás	(social adjustment)
Társas készségek	(social skills)

Table 6. Results of the Same Search in the Matriksz Database

316.624
323.39
364.27
antinomikus személyiség
antisocial personality disorder
antiszociális személyiségzavarok
antiszociális viselkedés
aszociális viselkedés (szoc)
deviancia
deviáns csoport
deviáns magatartás
deviáns magatartás és szubkultúra
deviáns magatartás és társadalmi beilleszkedés
deviáns társadalmi elemek (polit)
deviáns társadalmi viselkedés hatása (szoc.gond)
deviáns viselkedés
deviáns viselkedés

```
marginális viselkedés (szoc)
marginális, aszociális viselkedés
pszichopatologikus személyiség
személyiségzavarok
szociálpatológia
szociopatologikus személyiség
társadalmi deviancia
```

(and some not fully relevant terms, primarily owing to the "UDC index" records).

5 Searching the Bibliographic Databases

Whichever of the above indexing and search methods we prefer, it is very useful for subject searchers to get acquainted with the expressions and UDC numbers employed by our databases. Finding a relevant subject term might in itself be very helpful for subject catalogers, but for patrons who are interested in getting information on books and their locations, that is just a first step. They would want to use the selected subject term to search the bibliographic database of their choice.

The Matriksz project has put great emphasis on providing this service at the present time for the OPACs of the member libraries and for the VOCAL/ODR database. (It will soon be available for the MOKKA database, as well.) One or a combination of databases can be selected as a target for bibliographic searches. The default provided at present is the combination of the VOCAL/ODR and OSZK catalogs, which presents the widest possible range for searches at this time: the 11 full databases and additional location information from 45 ODR libraries, and the catalog of the National Széchényi Library.

It is quite straightforward for the user to switch from searches performed in the Matriksz database to bibliographic searches in the chosen remote online catalogs. As is shown in Figure 2, during one or several Matriksz database searches users collect their terms of interest: these can either be real language expressions or UDC strings (truncated as much as relevant), which, owing again to the parallelisms established in the subject and call number records, are much easier to interpret than in an average UDC

search. Users then select the target bibliographic database and indicate which indexes of the target database they wish to search.

The indexes that are offered on the Matriksz interface for searching the bibliographic database are not only subject and UDC indexes. In an environment in which there exist major catalogs without subject terms, it is also important to use title fields and indexes when performing subject searches.

6 Search 3

The expressions and UDC strings collected in Search 2 are now used in bibliographic searches. The subject terms relevant to the topic and revealed through navigation in the subject databases in Search 2 are now collected for one complex search in various target bibliographic databases. The search terms used are all of the following: *deviancia, deviáns viselkedés, antiszociális, viselkedés, deviáns magatartás, beilleszkedési zavar, bűnözés, bűnözői viselkedés* (deviance, deviant behavior, antisocial, behavior, deviant conduct, difficulty in adaptation, criminality, criminal behavior).

Table 7. Search Results from Search 3

	Number of records in the catalogs of				
	DEENK	**OSZK**	**SZTEEK**	**VOCAL**	**VOCAL+OSZK**
Subject search	70	23	169	712	735
Subject or UDC	93	26	216	972	998
Subject or UDC or title	140	33	245	1000	1033

The search results, when compared to those in Table 3, permit the conclusion that the one composite search formulated with the aid of the Matriksz database resulted in more records than the several searches performed in Search 1. Looking at the data from the Szeged and Debrecen catalogs suggests that Matriksz can even serve as an enhanced subject

search tool for library catalogs, compared to the standard OPAC subject search services.

The results of the bibliographic searches appear alphabetically in the Matriksz search result screen, in a single list with an indication of the resource database. Records can be viewed one by one in longer formats. The MARC format is especially important here, since it is the only source of location information at present. As the databases themselves may contain sundry location information and other services, it will be important in the future to enable Matriksz to lead us not only to its own result screens, but back to the interfaces of the searched bibliographic databases (Figure 3.). The left panel displays a segment of the united search result, with the name of the source database in brackets. The right panel shows one of the VOCAL records displayed in MARC with the holdings library codes.

7 Database Maintenance

The four elements of the Matriksz database differ considerably in their maintenance as well. The records of the UDC index list and the OSZK thesaurus can be considered relatively complete. The occasional updates and additions are primarily processed with an in-house thesaurus management software called Relex,[1] and the results converted to MARC format are fed into the Matriksz database periodically. The Debrecen[2] and Szeged subject lists are developed during daily cataloging work and the Matriksz database itself, together with the libraries' ILS cataloging modules, is relied on heavily when subject catalogers have to decide which terms, and in what form, can be added to the existing headings without disturbing the coherence of the system. The new headings and updates to

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[1] For the OSZK thesaurus and its maintenance, see Rudolf Ungváry, "Az OSZK tezaurusza és a KÖZTAURUSZ," *Könyvtári Figyelő*, 47 (2001).
See http://www.oszk.hu/kiadvany/kf/2001/1/ungvary_1.html.

[2] Klára Koltay, "Why and how to translate a subject heading system?" in *Library Automation in Transitional Societies: Lessons from Eastern Europe*, eds. Andrew Lass, and Richard E. Quandt (New York: Oxford University Press, 2000: 267–83).

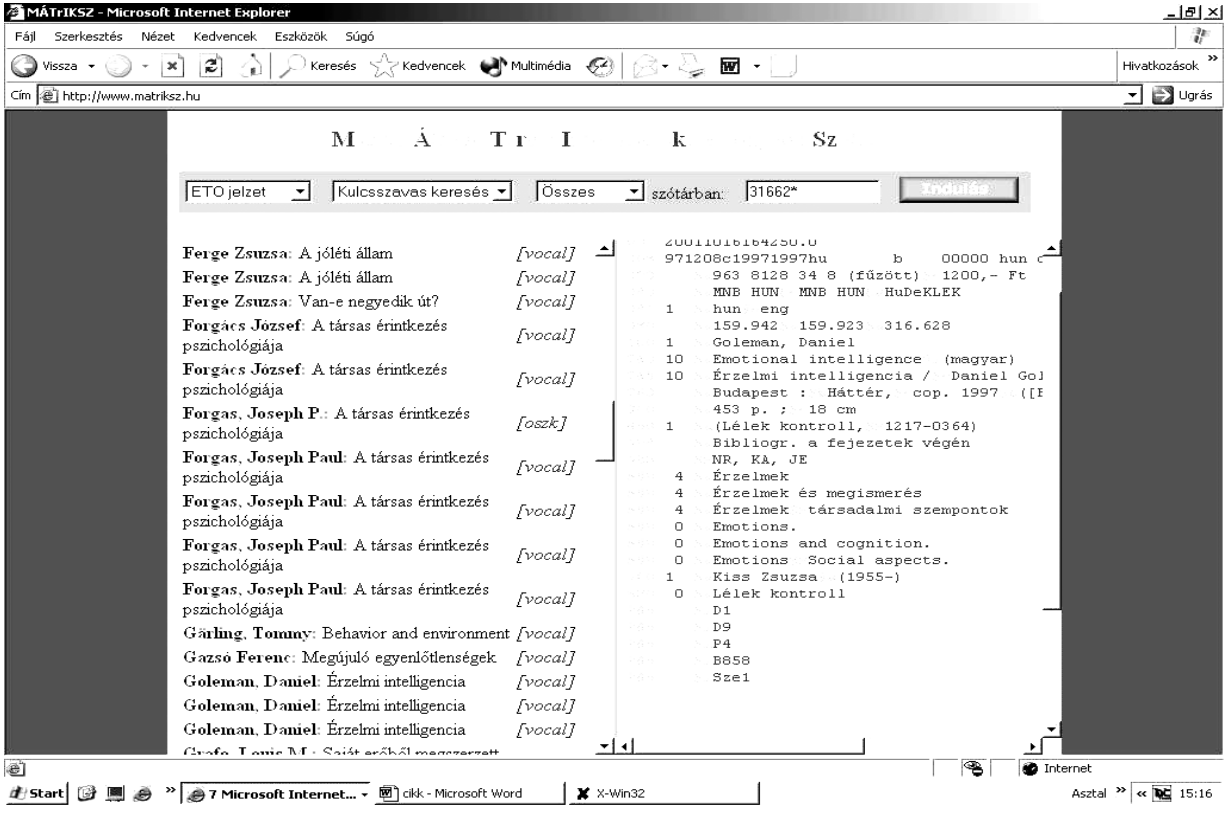

Figure 3. A Bibliographic Search by UDC String "31662%" in Both the OSZK and VOCAL/ODR Databases

the references of already existing headings are created in the local cataloging system and primarily saved to the local authority controlled catalog databases. However, since termdb and Matriksz provide special search capabilities in comparison with the local catalogs important for subject catalogers, it is important for all updates to enter these databases as well. The default save option of the local catalog modules provides the additional functionality of also sending updates to these common subject databases. The method is very convenient and straightforward for adding new information to the subject databases, but cannot really solve the problem of deleting complete subject heading records. This is also an important point of further development.

8 Results and Plans for the Future

In an experimental phase, the Matriksz database has charted a possible way of handling subject access in an environment of multiple indexing languages. Instead of aiming for the construction of a new comprehensive vocabulary, trying to persuade database owners to abandon their previous practices, and giving up on the problem of the few million records already indexed with other subject tools, Matriksz tries to work with what is available: it aims at storing the various subject schemes, creates parallelisms among the most important schemes, offers their records for download, thus promoting their use, and develops a search tool that counteracts the confusion created for library users by the existence of several schemes.

The Matriksz database is ready to incorporate other subject schemes as long as they are in MARC format, and ready to extend its accessible bibliographic database list with Z39.50 compliant catalogs/databases.

Besides widening the scope of databases linked to it, the program has four areas in which it plans to enhance its services.

9 Developing Vocabularies

Though the individual schemes have resources for development based on member libraries, creating parallelisms requires extra efforts from the

project. As the first tests show, it can be an effective tool for unification from the searcher's point of view.

Given the requirements of building and unifying vocabularies, the Matriksz database will gather detailed search statistics. Since the search terms with which users attempt to formulate their inquiries are often very different from those used in the controlled vocabularies, the project attempts to log the search terms that have been entered, and to process them in such a manner that popular terms entered by users can be identified and built into the controlled vocabularies either as references or as new headings.

10 Changing the Indexing Strategies

It is clear from the test runs on the termdb and Matriksz databases that they are indexed differently, and that an optional indexing structure has to be worked out, which will facilitate the unification of the two databases.

11 Enhancing Links to Bibliographic Databases

With the growing number of databases linked to Matriksz, it becomes more and more important to create a direct link from the Matriksz bibliographic search result window and its detailed item information and other functionalities to the local catalogs. If we want to use Matriksz as an additional subject tool attached to bibliographic databases, it must lead us back to the target database completely, just as termdb does. This is especially important in the case of location information and ILL services of the ODR database.

12 Working out an English-Hungarian Bilingual System

Parallelisms between Library of Congress subject headings and their Hungarian translations already present in the Debrecen records, and the planned English translation of the OSZK thesaurus provide the raw material for an English-Hungarian bilingual system. A well-structured system of

appropriate search indexes in the subject database and a set of rules for the formulation of searches in the bibliographic databases makes it possible for a foreign user to pick English subject terms in Matriksz, which enables searches of Hungarian bibliographic databases using Hungarian subject headings equivalent to the selected English terms. Or, conversely, Matriksz will enable Hungarian users to search foreign databases with Hungarian subject terms.