

Project ref. no.	<i>IST-1999-11748</i>
Project acronym	LIMBER
Project full title	Language Independent Metadata Browsing of European Resources

Security (distribution level)	Public
Contractual date of delivery	M24 Dec 2001
Actual date of delivery	21 st December 2001
Deliverable number	D-10
Deliverable name	LIMBER Evaluation Report
Type	Report
Status & version	Final 1.0
Number of pages	67
WP contributing to the deliverable	WP9
WP / Task responsible	UKDA
Other contributors	CLRC, NSD
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Keywords	System architecture, multi-lingual thesaurus, thesaurus management system, search interfaces, metadata standards, usability, inter-operability
Abstract (for dissemination)	This report describes the evaluation of various components of the LIMBER project.

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1. Executive Summary

This document (the deliverable D10) contains details of the evaluation of various parts of the LIMBER project including:

- ELSST, a multilingual thesaurus (English, French, Spanish, German) for the social science domain as a restricted vocabulary for indexing and accessing metadata entries;
- and a tool to assign keywords to metadata entries at the document, section and down to question levels.

Also contained in the introduction are details of the Metadata Representation for Social Science Data and the International User Interface to the NESSTAR client

1.1 Change Summary

Version	Date	Author	Notes
0.1	16/11/01	AE	First draft
0.2	23/11/01	BA, LB, AE, MGB	Updated with details of translation problems - appendices 5, 6, 7, and 8
1.0	21/12/01	BA, LB, AE, MGB, KM, TS, MW	Final version

1.2 Distribution

Project members
Reviewers from CEC

2. Introduction

This document describes the evaluation of the various parts of the LIMBER Project.

The European Language Social Science Thesaurus (ELSST) is derived and translated from HASSET. This involved reducing the present hierarchies so that all cultural and institutional specificity was removed. Each hierarchy has been translated into French, German and Spanish. The resulting four language, multi-lingual thesaurus has been converted into the RDF schema format for use in the management, indexing, browsing and search tools developed in LIMBER.

The ELSST thesaurus was evaluated continuously through feedback from members of the Council for European Social Science Data Archives (CESSDA) community of data archives. Evaluation workshops took place and participants included CESSDA, social science researchers and linguistic and metadata experts. One workshop was held in conjunction with the Conference of the International Association of Social Science Information Science Technologies (IASSIST) in May 2001 in Amsterdam which addressed the wider international community. A second workshop was held in September 2001 at the University of Essex in the UK for the User Group and wider European Community. Members of the UK Data Archive (UKDA) also evaluated the ELSST thesaurus using exercises produced for the second workshop.

In the LIMBER Metadata Environment Report (deliverable D3 of the LIMBER project), we described how some of the environmental parameters changed the metadata effort in LIMBER. Most important among these was the release of DDI 1.0 in March 2000 and the acceptance it received in the data archive community. In many ways DDI 1.0 has already become a de facto standard within the archive world.

Part of the LIMBER effort on metadata has been to suggest amendments to this standard in order to improve the multilingual aspects. These suggestions are also described in deliverable D3. They were all accepted by the DDI committee and included in DDI 1.01 in January 2001. This is a good indication of their success.

Another and more long-term part of the metadata effort has been to provide input to the DDI 2.0 process. This has been done jointly with the FASTER project where LIMBER has focused on the aspects of the metadata relevant for resource location. Here it has been argued for adopting an object-oriented model with mappings to other relevant standards for metadata like OMG, DC and ISO 11179. These proposals were presented to the DDI-committee for the first time in November 2000. The DDI meeting in January 2002 will decide on the future direction of the DDI 2.0 work, including evaluating the proposed changes.

The LIMBER extension of the NESSTAR client has had to be accommodated within the priorities and development cycles of the FASTER project. The expanded client was to be evaluated at the September meeting in Essex, but no client was available at that time. The client is now completed in a Beta-version and is available for download at <http://www.nsd.uib.no/limber>. Members of the CESSDA network will be asked to install this and give feedback. The LIMBER features will be part of the NESSTAR 2.0 client that will be released during 2002.

The purpose of the Indexing Tool is to aid workers in the archives who have to add keywords to metadata records. The keywords on the records can be used for keyword, rather than text content based searching.

The design of the Indexing Tool is a classic classification algorithm from the machine learning tradition. The majority of the evaluation was purely technical and included Effectiveness and Generality, Efficiency and Scalability, and Usability and Learnability.

3. Multilingual Thesaurus of Concepts in the Social Science Domain

3.1 Introduction

There were three main sources of evaluation of ELSST.

1. Feedback from CESSDA members
2. Feedback from members of organisations other than CESSDA
3. Internal evaluation at UK Data Archive (UKDA)

We discuss each in turn below.

3.2 Feedback from CESSDA members

The main stages in the development of ELSST centred round evaluation from CESSDA partners:

1. A reduced version of HASSET was produced (ELSST 0.1)
2. ELSST 0.1 was sent to CESSDA members for comment. (Translations of some hierarchies were also produced at this stage and sent to CESSDA members for comment.)
3. ELSST 0.2 was produced, incorporating changes suggested by CESSDA members
4. ELSST 0.3 was produced from 0.2, incorporating translations into French, German and Spanish.
5. ELSST 0.3 was sent to CESSDA members for comment
6. ELSST 1.0 was produced, incorporating changes to translations suggested by CESSDA members

We describe the format and summarise the feedback of each stage in the evaluation below.

3.2.1 Feedback on ELSST 0.1

Format of feedback

CESSDA members were sent the ELSST hierarchies in a number of stages: first the biggest hierarchies (economics, and labour and employment), then the rest of the hierarchies. They were asked to comment on the structure of the hierarchies, as well as on the individual terms. The translations of some German and Spanish hierarchies were also sent out to CESSDA members at this stage of the project. Comments were invited on translation, structure or content of hierarchies.

Results of feedback

The individual hierarchies were sent out to the CESSDA members in both traditional alphabetic thesaurus listing and full hierarchical listing. Comments were received in a variety of ways. The following is an example of the response for the Finnish Data Archive (FSD) who compared ELSST to the Finnish controlled vocabulary (YSA): -

BUSINESS ETC. COMMENTS

+ equivalent in YSA
- not equivalent in YSA
~ nearest equivalent in YSA
[in brackets other comments]
Addition suggestions in bold

Term: ADULT EDUCATION INSTITUTIONS

+ ammatilliset aikuiskoulutuskeskukset

J70.14.12

Term: AGGRESSIVENESS + aggressiivisuus [I think here should be RT instead of BT]	P82.30
Term: AGRICULTURAL ENTERPRISES UF FARM BUSINESSES ~ yritykset -- maatalous/maataloustoimiala ~ maatalousyrittäjät (=agricultural entrepreneurs)	Q12.60
Term: AGRICULTURAL PRODUCTS + maataloustuotteet	N54.40
Term: ANIMAL PRODUCTS + kotieläintuotteet [narrower terms in YSA, e.g., milk, honey, eggs, meat, wool]	G15.70
Term: ANTI-SEMITISM + antisemitismi	R44.40.10

These responses were then formalised into a common format (see next page) and the recommendations and comments discussed in regular meetings. Decisions from these meetings were then circulated to the CESSDA members for further comment.

The vast majority of recommendations and comments resulted in the addition of RT relationships, to terms already in ELSST or terms in HASSET that were then imported into ELSST, together with their hierarchies. Thus the major influence on ELSST from the CESSDA feedback at this stage was to increase the number of hierarchies from 20 to 49.

FSD FEEDBACK SUMMARY

ELLST		POTENTIAL RELATIONSHIPS (<u>underline</u> denotes a term already in ELSST)			FSD COMMENTS	UKDA COMMENTS
Hierarchy	Term	NT	RT	UF		
SOCIAL PROBLEMS	Crime	Juvenile delinquency	Criminalisation			
	criminal record		<u>Crime</u>		crime can't be in hierarchic relation with criminal record	crime is BT with NT criminal record at the moment
	Social disadvantage		human rights <u>social stratification</u> <u>discrimination</u> equality <u>income distribution</u> <u>social class</u>			
	class conflict			class struggle		
	social isolation		<u>emotional states</u> social relationships <u>interpersonal relationships</u>			
	social problems		<u>Addiction</u> Prostitution			
	unemployment	long-term unemployment				

So in the example above ADDICTION and PROSTITUTION were added as RTs to the term SOCIAL PROBLEMS and the full hierarchies of ADDICTION and HUMAN BEHAVIOUR (to which PROSTITUTION belongs) added.

The second most common comment involved changes to the hierarchical structure of the thesaurus, either through deletion of NTs, additions at the lowest level of a hierarchy or the duplication of an existing term into another hierarchy. In the above example CRIMINAL RECORD changed from being an NT and became an RT to CRIME.

Further changes involved the splitting of large hierarchies with very general top terms, such as GROUPS, into more specific smaller hierarchies, such as DISADVANTAGED GROUPS, ETHNIC GROUPS and AGE GROUPS.

The reduction to a broad based thesaurus had been far more drastic than we had initially predicted, however the number of suggestions for narrower terms at levels below the lowest level were very few indeed. This suggests that CESSDA members were happy at the depth of the hierarchies in ELSST.

The hierarchies that received the most criticism were those covering the methodological terms, hence our efforts to incorporate the NIWI thesaurus of Social Research Methodology as part of ELSST. Unfortunately agreement on this was too late to include the terms in the final published version, but a proposed listing is included in Appendix 15 Methodology Hierarchy of this report.

3.2.2 Feedback on ELSST 0.2

Format of feedback

CESSDA members who attended the IASSIST workshop were invited to do the Indexing Exercise and the Exploration and Search Exercise (see Section 3.3.2).

Results of feedback

The results of the IASSIST workshop are reported in section 3.3.2 below.

3.2.3 Feedback on ELSST 0.3

Format of feedback

CESSDA members who attended the September workshop (see Section 3.3.2 below) had the opportunity to assess ELSST via the Evaluation Exercise. Additionally, a copy of the thesaurus mounted on a database (not the official LIMBER database, which was not available at the time) was sent to all CESSDA members to evaluate at their leisure. They were asked to comment on its content and structure.

As for the French, German and Spanish versions of ELSST 0.3, alphabetical listings of terms with their English equivalents were sent to the appropriate CESSDA members prior to the September workshop. Evaluators were asked to comment on the translation, and suggest language-specific UFs.

The results of the feedback are reported below for each language.

Feedback on French

The French translation of ELSST was sent to the French and Swiss CESSDA members who collaborated with each other on the revision task. They then submitted revisions which

represented a consensus of their views. This was very useful, given that the person responsible for the original translation was a non-native French speaker and was therefore not in a position to decide between two conflicting suggestions for revision. We are grateful to the revisers for the very extensive and detailed feedback they provided, which not only enhanced the final translation, but also gave ideas for future work.

Some changes were grammatical (e.g. changes in plurality and/or determination). Other changes were more substantive, and include the following cases:

(1) Qualifiers were added to ambiguous French terms to reduce ambiguity:

English	original translation	revised translation
<i>EDUCATIONAL FEES</i>	<i>DROITS D'INSCRIPTION</i>	<i>DROITS D'INSCRIPTION (ECOLE)</i>
<i>ADVICE</i>	<i>CONSEIL</i>	<i>CONSEIL (AVIS)</i>
<i>COMPANIES</i>	<i>SOCIETES</i>	<i>SOCIETES (ECONOMIE)</i>

(2) UFs were promoted to Preferred terms

English	French
<i>ONE-PARENT FAMILIES</i>	<i>FAMILLES MONOPARENTALES</i>
<i>MEDICAL INSURANCE</i>	<i>ASSURANCE MALADIE</i>

(3) Preferred terms were demoted to UFs:

English	French	new preferred term
<i>UNEMPLOYMENT BENEFIT</i>	<i>ALLOCATIONS DE CHOMAGE</i>	<i>PRESTATIONS DE CHOMAGE</i>
<i>LEGISLATIVE ENACTMENT</i>	<i>PROMULGATION DE LOIS</i>	<i>ACTE LEGISLATIF</i>
<i>BOARDING SCHOOLS</i>	<i>INTERNATS</i>	<i>PENSIONNATS</i>

(4) Substitution of a verb phrase for a noun phrase

English	original translation	feedback
<i>LIVING ABROAD</i>	<i>RESIDENCE A L'ETRANGER</i>	<i>VIVRE A L'ETRANGER</i>

(5) Substitution of a noun phrase denoting a quality for a noun phrase denoting people

English	original translation	feedback
<i>SPEECH DEFECTIVE</i>	<i>MUETS</i>	<i>HANDICAP DE LA PAROLE</i>

A number of terms were identified, the translation of which proved difficult to establish without scope notes to explain their meanings. An example was EDUCATIONAL INCOME. In general, it was suggested that more scope notes were needed in the thesaurus. Certain hierarchies were identified as being particularly difficult to translate, e.g. the education hierarchy. It will need to be revisited at a later stage.

Another issue that was raised was the absence of accents on French terms. This is another area that will need to be reassessed at a later date. Similarly, one of the revisers felt that count nouns would be better in the singular, rather than in the plural, the strategy adopted by ELSST at present.

A large number of non-preferred terms were proposed and incorporated into the thesaurus. Suggestions for the addition or deletion of preferred terms were also made and will be reviewed at a later stage. Additionally some restructuring of the hierarchies was proposed, particularly to bring in some of the standalone terms into the main hierarchies. It was also noted that it was inappropriate to have CONSOMMATION DE L'ALCOOL PAR LES MINEURS (UNDER-AGE DRINKING) as a UF of INFRACTIONS LIEES A L'ALCOOL (DRINKING OFFENCES), since under-age drinking is not an offence in France. Similarly, it was felt that HOSPITAL WAITING LISTS was too narrow a term to be truly international and that it might be better to be subsumed by a more general term such as ACCESS TO HEALTH CARE.

As well as comments on content and structure of the thesaurus and its translation, feedback raised the issue of how to manage the different language versions of ELSST in the future. It was felt that the best way of doing this was through some sort of multilingual committee. Candidate terms or proposed changes could then be discussed within the committee, with final decisions always being taken by native speakers.

Feedback on German

The German translation of ELSST was sent to the Austrian and German CESSDA members who provided detailed and comprehensive feedback. We would herewith like to thank everyone who contributed with comments and suggestions. The feedback covered a wide range of aspects which are outlined below.

(1) The original English terminology was translated into High German ("Hochdeutsch"), the equivalent of what used to be referred to as BBC English. It did not take into account regional variations of German terms.

The feedback provided by the Austrian archive WISDOM included some country-specific terms which have been incorporated into ELSST. Examples are:

English	High German	Austrian German
<i>HOSPITAL</i>	<i>KRANKENHAUS</i>	<i>SPITAL</i>
<i>PENSION</i>	<i>RENTE</i>	<i>PENSION</i>

PATERNITY LEAVE

VATERSCHAFTSURLAUB

KARENZURLAUB

A future thesaurus project intending to build on ELSST could include further Austrian and perhaps Swiss terminology.

(2) The German translation aimed to use terminology of German origin wherever possible. Some of the feedback suggestions included foreign words of predominantly Latin origin and these suggestions have been included in ELSST. Examples are:

English	original translation	feedback
<i>COEDUCATIONAL SCHOOLS</i>	<i>GEMISCHTE SCHULEN</i>	<i>KOEDUKATIVE SCHULEN</i>
<i>CURRICULUM</i>	<i>LEHRPLAN</i>	<i>CURRICULUM</i>
<i>GENOCIDE</i>	<i>VÖLKERMORD</i>	<i>GENOZID</i>

(3) Germany introduced a spelling reform on 1st. August 1998. The aim of this reform was to simplify German orthography and to make spelling rules more consistent. Some of the new rules, however, are controversial and have still not been universally accepted. One of the proposed changes concerns the substitution of "ph" in "phon", "phot" and "graph" in some cases by "f". The feedback took account of the new rules and these suggestions were incorporated into ELSST.

Examples	original translation	feedback (alternative spelling)
<i>GEOGRAPHICAL DATA</i>	<i>GEOGRAPHISCHE DATEN</i>	<i>GEOGRAFISCHE DATEN</i>
<i>GEOGRAPHICAL AREAS AND COUNTRIES</i>	<i>GEOGRAPHISCHE GEBIETE UND LÄNDER</i>	<i>GEOGRAFISCHE GEBIETE UND LÄNDER</i>

(4) Some of the feedback served to update the terminology used in ELSST. In one particular case the original name of an organisation is used in ELSST but this name has changed in recent years. Example:

English	translation	feedback (new name)
<i>EUROPEAN ECONOMIC COMMUNITY</i>	<i>EUROPÄISCHE WIRTSCHAFTSGEMEINSCHAFT</i>	<i>EUROPÄISCHE UNION</i>

(5) The feedback also included suggestions for more compact terminology in German. Instead of using an adjective followed by a noun the use of compound nouns was suggested. These suggestions have also been incorporated into ELSST. Examples include:

English	original translation	feedback
<i>PHYSICALLY DISABLED</i>	<i>KÖRPERLICH BEHINDERTE</i>	<i>KÖRPERBEHINDERTE</i>
<i>URBAN RENEWAL</i>	<i>STÄDTISCHE ERNEUERUNG</i>	<i>STADTERNEUERUNG</i>
<i>INDUSTRIAL ENTERPRISES</i>	<i>INDUSTRIELLE UNTERNEHMEN</i>	<i>INDUSTRIEUNTERNEHMEN</i>

Feedback on Spanish

The feedback we received on ELSST from two different sources can be classified as content feedback and structure feedback.

The content feedback comprises the feedback from the student, mainly corrections on typos, issues of plurality and some language usage differences, which prove to be interesting material for further development or for introducing more UF terms.

English*	Spanish*	feedback
<i>MULTIVARIATE ANALYSIS</i>	<i>ANALISIS MULTIFACTORIAL</i>	<i>ANALISIS MULTIVARIADO</i>
<i>HOMELESSNESS</i>	<i>DESAMPARADOS</i>	<i>VAGABUNDAJE</i>
<i>PRIVATE HEALTH CARE</i>	<i>SANIDAD PRIVADA</i>	<i>SALUBRIDAD PRIVADA</i>
<i>HIRE PURCHASE</i>	<i>PLAN DE FINANCIACION</i>	<i>COMPRA A PLAZOS</i>
<i>RECRUITMENT</i>	<i>CONTRATACION LABORAL</i>	<i>RECLUTAMIENTO DE PERSONAL</i>
<i>COMPUTERS</i>	<i>ORDENADORES</i>	<i>COMPUTADORAS</i>
<i>LECTURES</i>	<i>CLASES DE UNIVERSIDAD</i>	<i>CATEDRA UNIVERSITARIA</i>

* Term as it is in the current version of the thesaurus.

The structural feedback was offered by the Spanish CESSDA member CIS only on the hierarchy for 'economics'. Their focus was on the structure of the hierarchy and thus, suggestions were made for the introduction of more preferred terms that do not appear in the hierarchies.

suggested Spanish term	possible translation for English
<i>DEUDA EXTERNA</i>	<i>EXTERNAL DEBT</i>
<i>PODER ADQUISITIVO</i>	<i>PURCHASING POWER</i>
<i>CLIENTES</i>	<i>CUSTOMERS</i>
<i>ASTILLEROS</i>	<i>SHIPYARDS</i>
<i>MINERIA</i>	<i>MINING INDUSTRY</i>
<i>SECTOR PRIMARIO</i>	<i>PRIMARY SECTOR</i>
<i>PESCA</i>	<i>FISHING INDUSTRY</i>
<i>CAZA</i>	<i>HUNTING</i>

3.3 Feedback from members of organisations other than CESSDA

Feedback from members of organisations other than CESSDA was sought via a number of workshops, to which CESSDA members were also invited. These workshops were as follows:

1. A requirements workshop at the start of the project (April 2000)
2. A workshop at IASSIST (May 2001): at this stage ELSST 0.2 was evaluated
3. An evaluation workshop at the end of the project (September 2001): at this stage ELSST 0.3 was evaluated.

We discuss the format and results of each workshop below.

3.3.1 Requirements workshop

Format of workshop

Various presentations were made on the LIMBER project and goals, and on the nature of thesauri and metadata (RDF). Following the presentations, discussion groups debated multilingual issues, interoperability, thesauri and automatic indexing and came up with a list of requirements for LIMBER, including desiderata for the multilingual thesaurus (see below).

The composition of delegates was as follows:

Organisation	Number
CESSDA Expert Seminar attendees	6
UKDA	5
Qualidata	1
Institute for Learning & Research Technology, Bristol	1
Mannheim Centre for European Social Research	1
Rutherford Appleton Laboratory	1
European Centre for Analysis in the Social Science	1
Paul Lazarsfeld Society for Social Research	1
National Centre for Social Research (EKKE)	1

Results of workshop

Recommendations were as follows:

1. The reduction of the existing HASSET thesaurus should be based on removal of cultural and institutional specificity and the existence of other domain thesauri.
2. The monolingual thesaurus should also include hierarchies to cover the elements of the DDI CodeBook standard that would aid determining compatibility between datasets, such as methodology, kind of data, universe, spatial unit, access conditions and file structure. Wherever possible these should build on existing listings.
3. A feedback mechanism for the appraisal of reductions and additions from each site should be set up.
4. Specialist teams, with social science backgrounds, at each user group site should oversee the translation of the monolingual thesaurus.
5. A mechanism, such as an email discussion group, should be set up for cross appraisal of translations and a further mechanism to deal with the possible translations of new additions of synonyms from each site.
6. The multilingual thesaurus should be designed to allow different hierarchical structures in each language and non-equivalence between the terms of each language.
7. The multilingual thesaurus should employ widespread use of scope notes, including scope notes to describe hierarchies, explain ambiguity or explain non-equivalence
8. Addition of language specific synonyms should be catered for.

Points 1-3 concern the monolingual thesaurus. Reduction of HASSET did follow the recommendations and resulted in more terms being removed than expected. However, CESSDA feedback seems to confirm that the level of this reduction was correct. An effort was made to include hierarchies to cover the methodology elements of the DDI. However, feedback from CESSDA members severely criticised these and hence adoption of the NIWI thesaurus of Social Research Methodology was sought. Mechanisms for appraisal were set up and worked very well. However feedback from these mechanisms continued way beyond the planned cut off date.

Points 4-8 concern the multilingual thesaurus. The most practical solution to producing the translations was for translators to maintain regular contact with each other throughout the project, via both email and meetings (see Section 3.4.2). Feedback from the user groups was then sought once a hierarchy or hierarchies were completed. We relied on the specialist knowledge of experts at the user group sites to verify translations.

The thesaurus was produced on the assumption of 1:1 equivalence between terms. This is the model adopted by many multilingual thesauri, including the OECD and UNESCO thesauri (OECD, 1991) (UNESCO, 1999). Following recommendations made at the LIMBER project mid-term review, however, an investigation was carried out into the possibility of partial equivalence between terms in different languages. We took as our starting point the ISO 5964-1985 guidelines on multilingual thesaurus construction (ISO, 1985). Our findings are reported in Section 3.4.2 below. Due to time constraints, it was not possible to present our findings to CESSDA members and allow time for feedback, so the decision was taken not to implement them at this stage.

The thesaurus contains both ambiguity and translation scope notes. However, the task of assigning scope notes to each Top Term of a hierarchy was abandoned, since it was not clear what form these scope notes should take or how useful they would be.

3.3.2 IASSIST workshop

Format of workshop

The workshop had two aims: to provide a tutorial on the use of thesauri, and to obtain feedback on ELSST 0.2. The evaluation of ELSST at the workshop took the form of two exercises, one to demonstrate how ELSST can be used for indexing, and one to demonstrate how ELSST can be used for searching for data (see Appendix 1 ELSST Indexing Exercise May 2001 and respectively Appendix 2 ELSST Exploration and Search Exercise May 2001). ELSST was mounted on a UKDA database (not the official LIMBER database, which was not available at the time) that was linked to datasets at UKDA. In both cases, the exercises were preceded by demonstrations.

Indexing exercise

The exercise was based on the Class Identity/Constitutional Issues (Identity) section of the British Election Study, 1997. Participants were invited to read each question and assign index terms from ELSST. They were also asked to record any additional terms that were missing from ELSST but which they thought would be useful, and to make any comments they liked about the content or structure of the thesaurus, or on how easy it was to find the terms.

Searching exercise

The exercise was in a number of parts. The first part led the user through the different ways of viewing a thesaurus entry (i.e. with its NTs, RTs, hierarchical structure, etc.). The second part demonstrated how the thesaurus could be used to search the database of datasets and look at the keywords in a number of languages. The third part showed how the different

translation equivalents could be generated. The fourth part encouraged the user to formulate search queries using ELSST terms to find out if there were datasets on specific electoral issues. The fifth part asked users to review one or more of a number of hierarchies - political institutions, political systems or politics in German or Spanish (or economics, or labour and employment in French)- and comment on the structure of the thesaurus or the translations.

Composition of delegates

Organisation	Number
CESSDA Expert Seminar attendees	5
UKDA	2
ICPSR	1
University of Latvia	1
Carleton College, USA	1
Instituto Juan March C/Castello, Madrid	1
Slovak Academy of Sciences, Slovakia	1
University of Ljubljana, Slovenia	1
Hungarian Database Information Centre, Budapest	1
University of Virginia	1

Results of workshop

In the event, the workshop proved more useful as a tutorial exercise and as a familiarisation exercise rather than as an evaluation exercise, due mainly to time constraints. Only a few general comments about the structure of the thesaurus and a few suggestions for additional terms were made. However, one CESSDA member commented that “the hierarchies seem logical and the system is rich and robust”.

3.3.3 September workshop

Format of workshop

The aim of the workshop was to evaluate LIMBER deliverables, including ELSST 0.3. The evaluation of ELSST 0.3 took the form of an evaluation exercise (see Appendix 3 ELSST Evaluation Exercise Sep 2001), which was available in the four different languages of the project. The exercise built upon the earlier exercises used at the IASSIST workshop. A questionnaire was added to help elicit more specific feedback on the thesaurus. As before, the thesaurus was mounted on a UKDA database (not the LIMBER thesaurus management system, which was not available at the time) and linked to the database of datasets at the UKDA.

The exercise

The exercise consisted of several parts. The first part showed the user different ways of viewing a thesaurus entry. The second part demonstrated how the user could view a term’s translation equivalents. The third part demonstrated how the thesaurus could be used to search the database of datasets and look at the keywords in a number of languages. The fourth asked the user to formulate search queries using ELSST terms to see if they were covered by the Labour Force Survey, and if they were not in ELSST, to suggest missing terms or make any other comment on the hierarchies. The fifth part asked users to review one or more hierarchies of their choice and comment on the structure or content of the thesaurus (or the translations in the case of those evaluating the non-English thesaurus). Finally, users were asked to complete a questionnaire (see below). Different language versions of the exercise were available, and participants were invited to do the exercise in the language of their choice.

The questionnaire

The questionnaire was based on the System Usability Scale (SUS) of John Brooke (Brooke, 1986). Note that while this scale was designed to test software, it was used in this instance to test data.

Inspiration for the content of the questions of the questionnaire was taken from Lorraine Toews "An Evaluation Methodology for Clinical Vocabularies and Evaluation of the Read Codes" (Toews, 1995). Although designed for testing clinical vocabularies, the evaluation criteria seem applicable to vocabularies in general. The criteria are as follows: coverage, scope, specificity, structures, maintenance and usability (see Appendix 4 Evaluation Criteria from Lorraine Toews). The last two criteria were disregarded, since they were not directly concerned with data, but rather management and usability issues.

Composition of delegates

Organisation	Number
CESSDA Expert Seminar attendees	9
UKDA	8
Arts and Humanities Data Service, UK	1
UK National Digital Archive of Datasets	1
Health Canada	1
Oxford University	2
Centre for Economic Performance, UK	1
Public Records Office, UK	1
Central Laboratory of the Research Councils, UK	1
Social Science Information Gateway, UK	1
Rutherford Appleton Laboratory, UK	1
Intrasoft, Greece	1
European Centre for Analysis in the Social Sciences, UK	1

Results of workshop

This workshop produced more comments on the thesaurus than the IASSIST workshop, mainly in the form of missing terms. Reaction to the thesaurus was generally favourable. One participant commented that "[the thesaurus] seems to have lots of potential", and another remarked that "[the thesaurus] will be very useful for indexing in data archives". However, many participants noted that they found it impossible to comment properly on the thesaurus in such a short space of time. This must be taken into account when assessing the responses to the questionnaire.

SUS scoring

Each statement was rated according to a 5-point scale, ranging from "strongly agree" (5) to "strongly disagree" (1). This number is known as the scale position. Where a participant could not answer the statement it was given a value of 3 (neither agree nor disagree). Like the original SUS scale, positive statements alternate with negative statements, thus forcing the respondent to read each statement and make an effort to think whether they agree or disagree with it.

SUS yields a single number (i.e. the SUS score) in the range of 0 to 100, with the average user response of '3' being represented by a score of 50. This represents a composite measure of the overall usability of the system being studied.

The SUS score is calculated by first summing the score contributions from each item. Each item's score contribution ranges from 0 to 4. For positive statements the score contribution is the scale position minus 1. For negative statements the contribution is 5 minus the scale position. The sum of the scores is multiplied by 2.5 to obtain the overall value. (A tenth

statement with a value of three for each participant was added, since the calculation of the SUS score assumes 10 statements.)

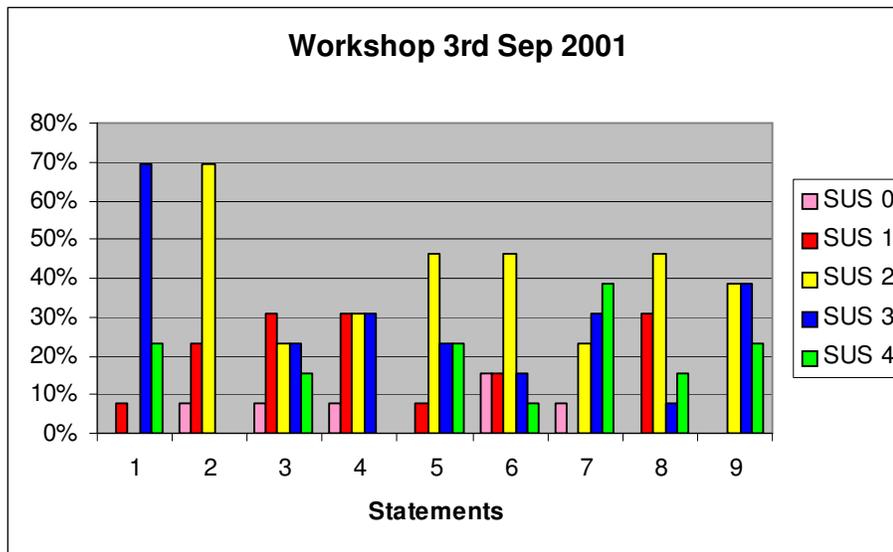
Results

The following table shows the scale positions input by the participants (A - M) in response to the statements in the questionnaire, and the SUS scores for each participant, based on the calculations detailed above.

Statements ↓													
	A	B	C	D	E	F	G	H	I	J	K	L	M
1 The hierarchies are well structured	4	1	3	4	3	3	4	3	3	3	3	3	3
2 The depth of the hierarchies is too shallow	2	1	2	2	2	0	2	1	2	1	2	2	2
3 The depth of the hierarchies is about right	4	1	2	3	3	0	3	4	1	1	1	2	2
4 There are too many missing terms	2	1	2	3	0	2	3	3	2	1	1	1	3
5 The thesaurus provides good coverage of the domain	2	1	2	4	3	2	4	4	3	2	2	2	3
6 the number of scope notes is inadequate	2	2	2	1	0	1	0	4	2	2	2	3	3
7 The scope notes are useful	3	2	2	4	0	4	4	4	2	3	3	4	3
8 There are too few synonyms	2	1	2	1	2	2	3	4	2	2	1	1	4
9 I would find the thesaurus useful for indexing/retrieval purposes	3	2	2	4	3	2	3	4	3	2	4	2	3
10													
Individual SUS scores	65	35	52.5	70	45	45	70	82.5	55	47.5	52.5	55	70
Average SUS score	51.92												

The average SUS score of all participants was 51.92.

The following graph shows the percentage of each score contribution (the coloured bars) allocated for each statement (1 - 9) in the questionnaire. A high score contribution means that the outcome from the statement was most positive for ELSST.



The graph shows that the nearly 70% of users thought the hierarchies were well structured. The majority of participants said they would find the thesaurus useful for indexing/retrieval purposes, and found the scope notes useful. Very few had negative comments about any aspects of the thesaurus.

3.4 Internal evaluation at UK Data Archive

3.4.1 Evaluation of the monolingual thesaurus

Format of evaluation

The views of members of the UKDA who are involved in either indexing or data searching (for users) were sought via several means:

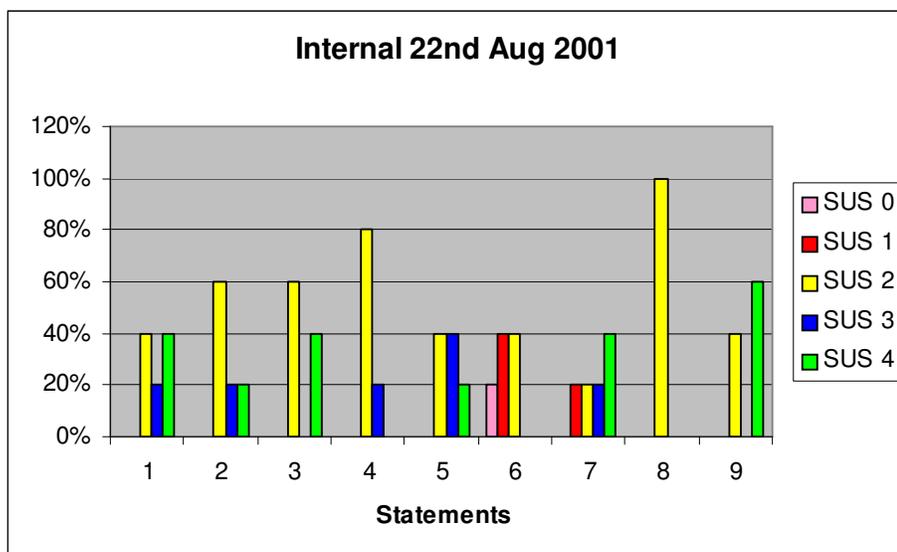
- via an internal workshop prior to the September evaluation workshop (ELSST 0.3): (The internal workshop used an exercise similar to the one used for the September workshop.)
- by allowing them access to ELSST 0.3 mounted on a database and asking them to report on it at their leisure.
- by inviting members of UKDA to participate in the external workshops described in Section 0 above.

Results of the evaluation

The internal workshop was very useful in honing the evaluation workshop exercise prior to the September external workshop. Response to the thesaurus was generally positive. Two reviewers commented that they were “very impressed” with the thesaurus overall. Suggestions were made concerning missing terms, and the fact that some smaller hierarchies could be incorporated into larger ones. The results of the questionnaire are as follows:

	Statements ↓	A	B	C	D	E
1	The hierarchies are well structured	5	3	3	5	4
2	The depth of the hierarchies is too shallow	1	3	3	2	3
3	The depth of the hierarchies is about right	5	3	3	5	3
4	There are too many missing terms	2	3	3	3	3
5	The thesaurus provides good coverage of the domain	4	3	3	5	4
6	the number of scope notes is inadequate	3	5	3	4	4
7	The scope notes are useful	4	5	3	2	5
8	There are too few synonyms	3	3	3	3	3
9	I would find the thesaurus useful for indexing/retrieval purposes	5	3	5	5	3
10						
	SUS score	77.5	50	55	67.5	57.5
	Average SUS score	61.50				

The average SUS score of all participants was 61.50.



Feedback was also received from three reviewers who took their time to review the thesaurus over a longer period. One commented "I like it [the thesaurus]. There are probably the right number of terms to keep the thesaurus manageable and nothing obvious (to me) seems to have been left out." The average SUS score from these three internal reviewers was 68.33

3.4.2 Evaluation of the multilingual thesaurus

Format and Results of Evaluation

Translators were in regular email contact with each other throughout the project and translation meetings were convened at regular intervals to discuss translation issues as they arose. Queries arising from these discussions were, where appropriate, fed back to those responsible for the monolingual thesaurus, so that modifications could be made. Topics that were covered included:

- Discussion of terms that were difficult to translate because:
 - They were ambiguous:
This often necessitated the addition of a scope note in the English and other language versions. An example was INNER CITIES, which required a scope note to capture its connotation.
 - They were culture specific:
An example is PRIME MINISTERS, which has no direct equivalent in German or Spanish. The solution here was to change the English term to a more culture-neutral term (e.g. PRIME MINISTERS was changed to HEADS OF GOVERNMENT).
 - Distinctions between closely related terms in the source language were difficult to capture in the target language:
An example here was the closely related terms JOB TRAINING, OCCUPATIONAL TRAINING, PROFESSIONAL TRAINING and VOCATIONAL TRAINING. In French and German, it was difficult to distinguish between PROFESSIONAL TRAINING and OCCUPATIONAL TRAINING. It was decided in this instance to retain the most general term (i.e. OCCUPATIONAL TRAINING) as the preferred term and include the other terms as UFs.
 - The source term was more general than the target term:

An example here is DRUGS, which refers to both legal and illegal drugs, which require separate translations in the other three languages. For example, in German, it is translated as DROGEN UND MEDIKAMENTE

- Discussion of the definition and treatment of partial equivalences in ELSST:
Following the project's mid-term review, a great deal of time was spent by translators on how to define and deal with partial equivalences in ELSST. As mentioned in Section 3.1.1 above, we took as our starting point the ISO 5964-1985 guidelines on multilingual thesaurus construction.
Our results are presented in Appendices 5-8. Appendix 5 is a discussion of translation problems in ELSST. It defines what we mean by translation mismatch in ELSST and presents ways of dealing with them. Examples are, where possible, given in all three languages (French, German and Spanish). Other problems encountered by translators during the translation of ELSST are also discussed.
Appendix 6 presents a list of translation mismatches for English-Spanish, Appendix 7 for English-German, and Appendix 8 for English-French.
Since there was not enough time within the lifetime of the project to permit a proper evaluation of partial equivalences for ELSST, the decision was made not to implement them at this stage.

Additionally, the Spanish translation was checked by a Spanish speaking political scientist student and the near-final French translation was checked by a French student who is a qualified English-French translator (a French speaking social scientist was not available at the time).

Despite the above measures many inconsistencies in the translations were not detected until the translations were completed and a number of checks were carried out on them. Various files of different views of the data were generated, including an alphabetical list of every English term with its translation in the other languages, and alphabetic lists of all French terms, German terms, etc., with their English equivalents. These checks included the following:

- Plurality

Surprisingly often, a plural term had been translated by a singular term, even where a plural term was available in the target language. The reverse was also the case. Of course it was recognised that plurality may differ across languages. For example, EXPENDITURE which is singular in English translates into the plural GASTOS in Spanish.

- Consistency of meaning across the four languages

Occasionally a term was interpreted differently in one or more languages. This happened most often in the case of standalone terms that didn't have any hierarchical structure to help disambiguate them. An example is PERFORMANCE, which had been translated to mean either "efficiency" or "artistic performance".

- Treatment of qualifiers in ELSST

The main aim of qualifiers is to disambiguate two or more terms in the same language that have the same form but different meanings. An example is LABOUR (BIRTH), LABOUR (RESOURCE), and LABOUR (WORK) in English. However, it frequently happens that when the terms are translated into another language, the terms are non-identical, and thus do not require qualifiers. Thus, LABOUR (BIRTH) translates as WEHEN in German, which is unique in the German thesaurus, and thus does not need a qualifier. However, checks revealed that qualifiers had frequently been translated in cases where it was not strictly necessary. Examples of the opposite case, where two terms in English translate as the same term in the target language also arose, but were easier to detect. For example, ENTFÜHRUNG is the German translation for both kidnapping and hijacking, so had to be translated as ENTFÜHRUNG (PERSONEN) and ENTFÜHRUNG (OBJEKTE) respectively.

- Consistency between terms in scope notes and terms in the thesaurus

Occasionally, terms referred to within scope notes were not found in the thesaurus so reference to them had to be omitted.

- Consistency in the translation of a term that appeared in two or more terms

In some cases, a word had been translated differently in one term than in another (e.g. STUDENT in STUDENT-TEACHER RELATIONSHIP, and STUDENT-TEACHER RATIO).

An additional evaluation of the multilingual thesaurus was carried out by performing a brief comparison with the EUROVOC thesaurus. The results are described in Appendix 9 A comparison of ELSST and EUROVOC

4. Conclusion on the ELSST thesaurus

The evaluation feedback from both CESSDA members and other organisations has been very positive both in terms of scope and depth of the ELSST thesaurus and the potential shown through the other deliverables for using the multilingual thesaurus as a valuable tool in locating and interpreting resources that can be used for comparative research.

CESSDA feedback on the translation has been excellent, but did in fact result in extra work in the actual structure and content of the thesaurus, that we had initially thought would be finalised by month 12 of the project.

The success of the project is perhaps best reflected in the further initiatives and projects that will continue the achievements of the LIMBER project.

- The CESSDA members wish to adopt the ELSST thesaurus as the controlled vocabulary for their virtual catalogue of European data resources.
- NIWI have agreed to allow use of their Thesaurus of Social Research Methodology (SRM) in the same catalogue.
- Further languages of Finnish, Norwegian, Danish and Greek are proposed in a future EU project.
- The RDF schema for thesaurus developed in the LIMBER project will be taken forward and proposed as an international standard for the interchange of thesauri.
- The DDI committee will review the RDF interpretation of the proposed object oriented model for version 2 of the standard due for release in 2003.
- The NESSTAR company plan to develop the thesaurus interface and internationalisation further.
- Intrasoft plan to enhance their software by export as well as importing thesauri in the RDF format.

Further work is required on the thesaurus.

- The methodology listing from the NIWI thesaurus of Social Research Methodology (see Appendix 15 Methodology Hierarchy) needs to be incorporated into ELSST.
- The scope of ELSST needs to be widened through the addition of other hierarchies.
- The use of the partial equivalence relationship has to be investigated further.
- Mechanisms have to be implemented for management of ELSST as a working tool.

However we are very pleased with the results of the project.

5. Metadata Keyword Indexing Tool (CLRC)

The purpose of the Indexing Tool is to aid workers in the archives who have to add keywords to metadata records. The keywords on the records can be used for keyword, rather than text content based searching. The ELSST thesaurus in the TMS provides a set of acceptable keywords in a restricted vocabulary. These can be used to mark up the metadata records so that they can be searched by the synonyms or translations of those keywords, currently provided in the thesaurus in English, French, German, Spanish and in the future in further languages.

The requirements for the indexing tool included contradictions between different stake holders. Existing experienced and knowledgeable archivists wanted a semi-automated tool to speed their mark-up. In contrast, managers of existing archives, and those establishing archives wanted an automated tool that would at least result in the de-skilling of the role if not its abolition.

The tool has been designed to meet these two needs, as well as to provide generic abilities to mark-up XML files with keywords from restricted vocabularies, not just the DDI metadata format, and not just with keywords from the ELSST thesaurus, nor even thesauri hosted on the TMS.

5.1 Evaluation Design

The evaluation of the Indexing Tool covers the following aspects:

- Effectiveness and Generality
- Efficiency and Scalability
- Usability and Learnability

The major bulk of the evaluation is purely technical. The design of the Indexing tool is a classic text classification algorithm from the machine learning tradition. This requires learning associations between keywords and text terms in a set of training documents, which are then used as a basis to index future documents. Therefore conventional information retrieval measures can be used to evaluate the effectiveness of the tool - recall, precision, coverage of keywords and terms. Classifiers were created using three different learning sets of 100, 1000 and 2000 files respectively to provide the basis for these measures.

The generality of the tool to XML documents has been ensured by using a generic XML parser for the metadata files, as well as defining the fields to be searched and locations of keywords to be inserted in XSLT scripts transformed by generic XSLT tools.

The efficiency of the implementation will be measured by timing the stages of generating a classifier and of classifying documents.

The scalability of the design can only be assessed by extrapolating these efficiency measures.

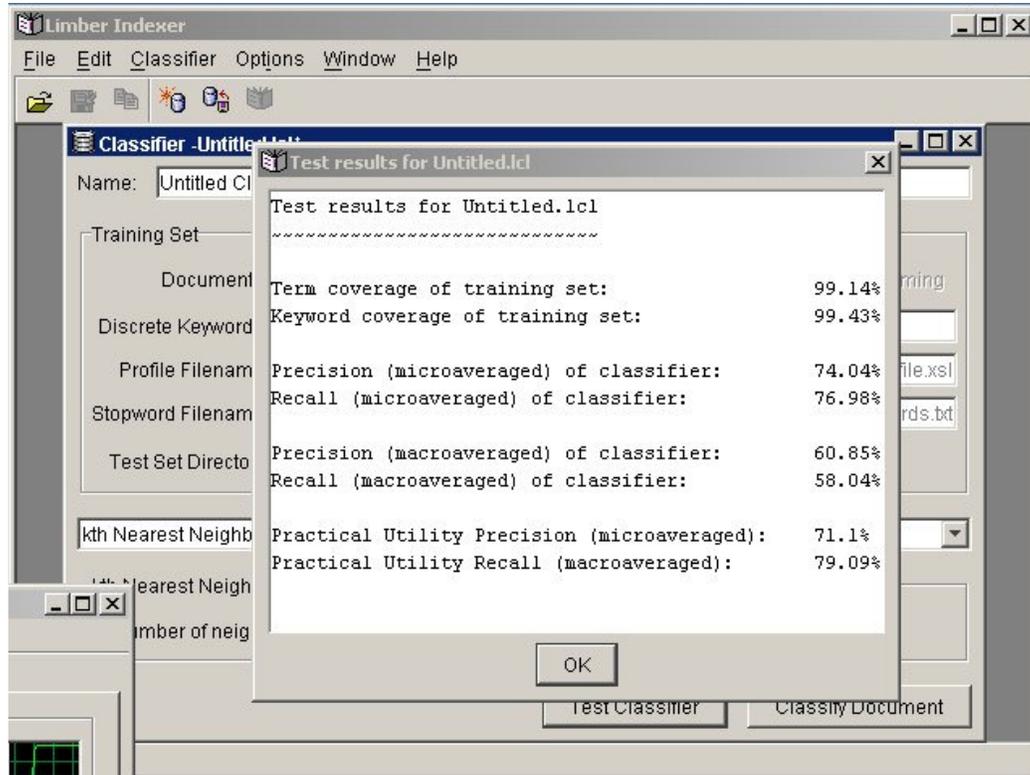
The usability has been evaluated for a wide ranging user population by providing the tool to users in the specific archive community and to more general information science (library) staff for them to play with. This process also evaluated the learnability since they were able to discover the role and usage of the tools in order to use them. No formal user evaluation has been undertaken to record human performance times, error counts or error recovery strategies.

5.2 Evaluation Findings

The results of the evaluation study are described below for each of the evaluation points outlined in the previous section.

5.2.1 Effectiveness and Generality

The tool includes facilities to test a classifier when it is created. These report the usual information retrieval statistics over a test set of records as shown in the figure below.



The table below shows the recall and precision values for a range of values of the k and d parameters of the Knn algorithm for classifiers generated over three different sizes of training sets with 100, 1000 and 2000 files in them.

Although the best recall is over 90% and the best precision is over 70% unfortunately these do not occur with the same values for the parameters. However, figures for both measures over 70% were obtained by using very low values for both parameters when a classifier built on a large training set was used.

The interactions in these data are complex and require considerable thought before they can be turned into clear guidance to users on how to set the values for these parameters. However, the testing and reporting facilities provided by the tool allow users to obtain such measures with ease for their own training and test sets where performance may be different.

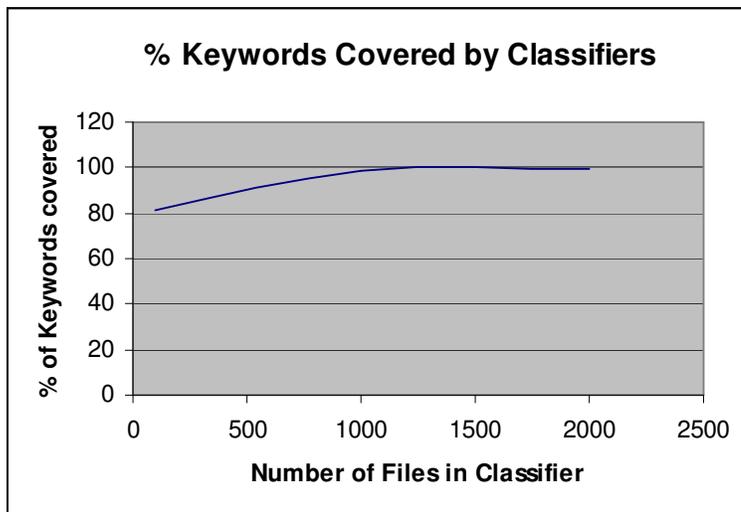
Classifier k	d	recall	precision
100	7	3	29.95
	10	1	65.62
	1	1	39.28
	1	10	39.28
	20	20	11.63
	20	1	72.44
1000	1	20	39.28
	7	3	45.18
	1	1	57.48
	20	20	11.23
	20	1	87.73
2000	1	20	57.84
	7	3	53.1
	10	8	29.7
	10	1	90.22
	1	1	79.09
	1	10	79.09
	20	20	11.76
20	1	93.4	

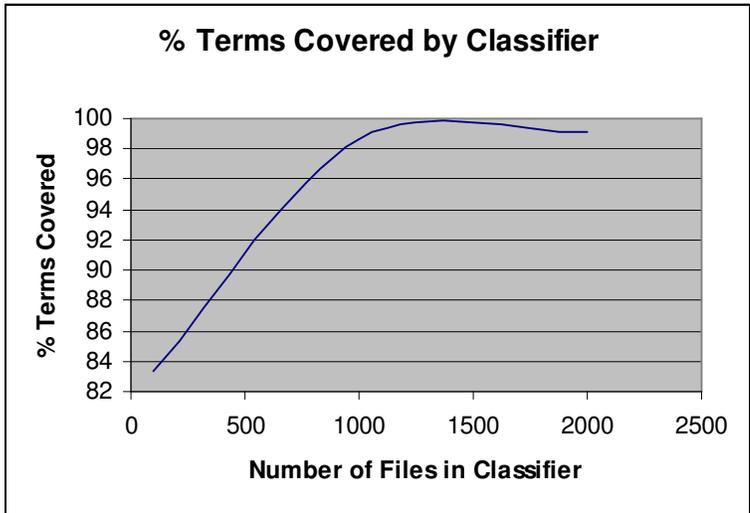
Table showing the recall and precision values for a range of values of the k and d parameters of the Knn algorithm for classifiers generated over three different sizes of training sets.

Coverage

The coverage of a classifier is evaluated by checking what proportion of terms in the documents in the test set are included in the classifier, and what proportion of keywords that have already been marked up for those documents are included within it. Obviously percentages closer to 100% are better than those close to 0%.

The two graphs below report the test data for the three classifiers constructed from 100, 1000 and 2000 files in the training set, against a test set of 100 files. They clearly show that a classifier created with 1000 files has already reached greater than 98% coverage of both terms and keywords, and any extra items in the learning set add little to the coverage.





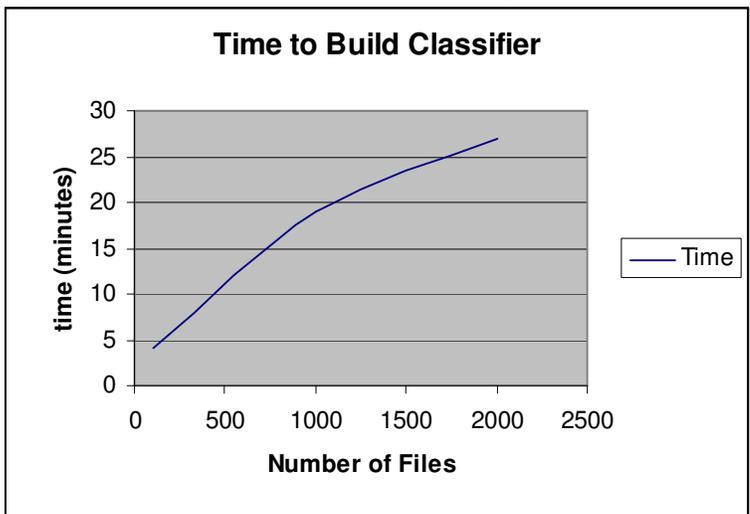
5.2.2 Efficiency and Scalability

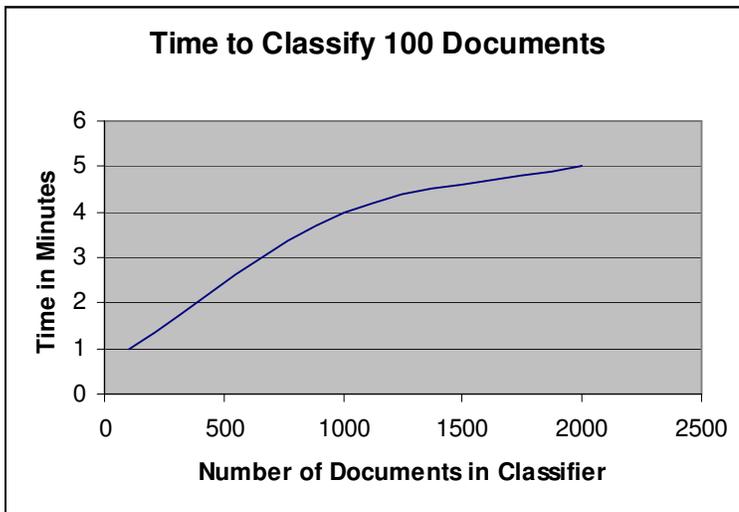
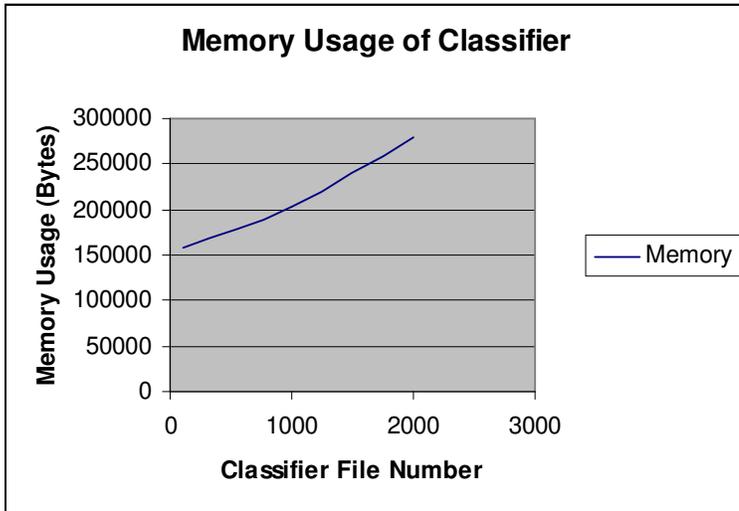
The efficiency and scalability of the tool are evaluated by the performance time of the system to perform its functions and the resources drawn upon.

The three graphs below report the times to build a classifier, the time to classify 100 documents, and the memory resources consumed by the tool with increasing sizes of classifier.

The two time graphs show that the tool will scale without exponential increases in time since the curves are flattening out at the upper range. The exact values in these of about 30 minutes to build a classifier with greater than 98% coverage, and about 5 minutes for it to classify 100 documents are both within the tolerable limits for non-functional requirements expressed by the user populations.

The memory use on the other hand is clearly rising in a straight line with the number of files in the learning set of the classifier. This appears to suggest at worst linear scaling for the tool if larger classifiers are built to reach even better performance.





If readers are confused why these numbers are significantly different from those reported by Michael Wilson at the Sep 2001 LIMBER evaluation workshop, the numbers reported there were recorded from within the Interactive Development Environment (IDE), whereas these were recorded from the tool running standalone. Consequently, the virtual memory limitations on the number of files used to create a classifier have been removed, and the times are faster outside the IDE.

5.2.3 Usability and Learnability

User Tasks

As mentioned at the start of this section on the Indexing Tool, there are conflicting requirements on the tasks to be performed, but all have been included.

The user tasks addressed are:

- installing the system
- creation of a classifier
- the semi-automatic classification of a document

- the cross-lingual keyword indexing of a document using a multilingual thesaurus in the TMS
- the automatic batch classification of a document.

Users found the steps required for each of these tasks easy to follow with only one significant problem. That was the selection of appropriate values for the three variables d, k and the depth of stemming in English. Further guidance will be required in the documentation for the setting of the best values for these following the evaluation results reported above.

The system is delivered as a jar archive which calls on a version of the SAX XML parser libraries, several attempts at installation found problems with versions of the SAX library. This problem can be addressed by improving the installation procedures.

Menu items and dialogues

The menu items and dialogues are all standard and apart from the problem with variables in the algorithm reported above there were no significant problems.

Help files - reference and tutorial

The help provided includes a tutorial to the 5 tasks listed above, and a general reference page. The first was acceptable to users although improvements will be required, while the second requires considerable improvement in its structure to identify the variable values to use.

Internationalisation and localisation

The menu and dialogue items have been internationalised and localised to English, French, Spanish and German. The German translation was provided by the professional translators at the UKDA, while the others were produced by native speakers at CLRC. These were not thoroughly evaluated by other native speakers. The help files were only provided in English and require translation to other languages to complete localisation.

6. Conclusions and Recommendations for the Metadata Indexing Tool

The general conclusions are that:

- the system provides greater than 70% precision and greater than 79% recall with a large classifier and the appropriate parameter settings for the algorithm
- the system can provide greater than 98% coverage of terms and keywords with a classifier based on 1000 records in the training set
- the system will scale with linear or better performance for the creation of classifiers and the classification of documents as the training set increases in size
- the system is both learnable and usable by the range of expected user population

The following are required to improve the usability and performance of the tool:

- translation of the help files
- improved help file guidance on the use of algorithm variables.
- improvements in the installation procedures.

The designers of the system would also like to include other text classification algorithms than the Knn one included in order to investigate possible improvements in effectiveness of indexing. Alternatives were reported in the design deliverable.

7. The Thesaurus Management System

The Thesaurus Management System (TMS) includes both a server and two client components. The server hosts the thesauri, and is accessible across the internet using an HTTP server, while the clients allow end-users with read only functionality, or administrators with additional functionality to access the TMS.

7.1 Evaluation Design

The TMS evaluation will address Effectiveness, Efficiency and Scalability of the implementation.

The effectiveness is evaluated by ensuring that the functions stated in the requirements have been provided by the TMS.

The efficiency and scalability have been evaluated by load testing the server.

7.2 Evaluation Findings

The server and client functions defined in the requirements have been checked against the implementation and the design and are provided, with the exception that the server cannot output RDF although it can read it in, and that the clients do not support internationalised and localised user interfaces to French, German and Spanish, they only provide an English user interface. No help facilities or user documentation are provided beyond the LIMBER deliverables D7.1, D7.2, D8.1 and D8.2 which thoroughly describe the design and implementation.

The server has been load tested for the size of thesaurus that it can host. A test thesaurus of more than one million nodes (terms) with three links per node has been run without apparent reduced performance in query response times.

The generic functionality of the server has only been tested with the TMS clients and with the NESSTAR data access system as one example of a data access system. Since the API of the server can provide the functionality required by NESSTAR, it is assumed that other data access systems could also use the TMS server, although a sample of these have not been tested.

The server has been running for several months in Greece and been tested over the Internet showing that it is able to remain running under use.

The server has been run on a 386 processor machine and the retrieval times to queries do not noticeably slow compared to a modern Pentium III system. This shows that the system is not bound by CPU processing.

8. Conclusions for the TMS

The TMS is a prototype and is not yet an industrialised product. The help facilities and internationalisation of the clients would need to be provided, and the installation procedures generalised if an industrial product were required. Equally, for a generic TMS product it would be necessary to define interfaces to data access systems beyond NESSTAR, although the API definitions provided should allow developers of such systems to produce their own interfaces.

Appendix 1 ELSST Indexing Exercise May 2001

Indexing Exercise LIMBER workshop, IASSIST conference, May 2001

The following questions are adapted from the British Election Study, 1997.

Taxation and government spending

Quest 1: Some people feel that government should put up taxes a lot and spend much more on health and social services. Other people feel that government should cut taxes a lot and spend much less on health and social services. And other people have views somewhere in-between..... Please tick whichever box comes closest to your own view about taxes and government spending.

Quest. 2: Now where do you think that the political parties stand? First the Conservative Party....

Class identity/constitutional issues (Identity)

Quest 1: Do you ever think of yourself as belonging to any particular class? If yes, which class is that:

1. Yes, middle class
2. Yes, working class
3. Yes, other (write in verbatim)
4. No

Quest 2: On the whole, do you think that there is bound to be some conflict between different social classes, or do you think they can get along together without any conflict?

1. Bound to be conflict?
2. Can get along?

Quest 3: Thinking now about Protestants and Catholics in Scotland. Using a phrase from this card, how serious would you say conflict between them is:

1. Very serious conflict
2. Fairly serious conflict
3. Not very serious conflict
4. There is no conflict

Quest 4: On the whole, do you think that there should be separate schools in Scotland for Catholic children, or that this system should be phased out?

1. Separate schools
2. Phase out

Quest 5: Which, if any, of the following best describes how you see yourself?

1. English not British
2. More English than British
3. Equally English and British
4. More British than English
5. British not English
6. Other description (write in)
7. (None of these)

Quest 6: Which of these statements best describes your opinion on the present system of governing Britain?

1. Works extremely well and could not be improved
2. Could be improved in small ways but mainly works well
3. Could be improved quite a lot
4. Needs a great deal of improvement

Quest 7: An issue in Scotland is the question of an elected parliament – a special parliament for Scotland dealing with Scottish affairs. Which of these statements comes closest to your view?

1. Scotland should become independent, separate from the UK and the European Union
2. Scotland should become independent, separate from the UK but part of the European Union
3. Scotland should remain part of the UK, with its own elected assembly which has some taxation powers
4. Scotland should remain part of the UK, with its own elected assembly which has no taxation powers
5. Scotland should remain part of the UK without an elected assembly

Quest 8: As a result of this Scottish parliament would Scotland's economy become better, worse or would it make no difference?

Quest 9: As a result of this Scottish parliament would the standard of the health service in Scotland become better, worse or would it make no difference?

Quest 10: As a result of this Scottish parliament would the quality of education in Scotland become better, worse or would it make no difference?

Quest 11: As a result of this Scottish parliament would the standard of social welfare in Scotland become better, worse or would it make no difference?

Appendix 2 ELSST Exploration and Search Exercise May 2001

Exploration and Search Exercise Question Sheet LIMBER workshop, IASSIST conference, May 2001

1) Five ways of using thesaurus to help define concepts

a) Kwic listing e.g. pollution of the air

AIR POLLUTION
CHEMICAL POLLUTION
INDUSTRIAL POLLUTION
LAND POLLUTION
MARINE POLLUTION
NOISE POLLUTION
OIL POLLUTION
PETROLEUM POLLUTION
POLLUTION
POLLUTION CONTROL
SOIL POLLUTION
VISUAL POLLUTION
WATER POLLUTION

b) Synonyms eg environmental damage

USE ENVIRONMENTAL DEGRADATION

c) Broader term and all narrower terms of that term

e.g. Global warming BT ENVIRONMENTAL DEGRADATION

NTs:- AMENITIES DESTRUCTION
GLOBAL WARMING
GREENHOUSE EFFECT
OZONE LAYER DESTRUCTION
POLLUTION

d) Full Hierarchy e.g. pollution

ENVIRONMENTAL CHANGES
 ENVIRONMENTAL DEGRADATION
 POLLUTION
 AIR POLLUTION
 ACID RAIN
 PASSIVE SMOKING
 INDUSTRIAL POLLUTION
 NOISE POLLUTION
 AGRICULTURAL NOISE
 INDUSTRIAL NOISE
 TRAFFIC NOISE
 OIL POLLUTION
 SMELL
 SOIL POLLUTION
 VISUAL POLLUTION
 WATER POLLUTION
 MARINE POLLUTION

e) Related terms e.g pollutants

AIR POLLUTION
CHEMICALS
INDUSTRIAL POLLUTION

OIL POLLUTION
POLLUTION
SMELL
WATER POLLUTION

2) Search metadata, expand and display keywords and their equivalents

- a) Enter GLOBAL WARMING set search to English and controlled vocabulary
- b) click search button
- c) click expand search
- d) select Plus ALL BTS
- e) select a Title
- f) Click on Keywords
- g) Click on French, German or Spanish

3) Compare Hierarchies

- a) Set search to German and thesaurus
- b) Select SOZIALE WOHLFAHRT from top terms
- c) Click on any of the NT boxes
- d) Click on the empty box labelled 01
- e) Click on the term 01 - - SOZIALDIENSTE >>
- f) Click on the term 02 - - - - PERSONENBEZOGENE SOZIALDIENSTE >>
- g) Click on the term 03 - - - - - KINDERFÜRSORGE >>
- h) Click on the term 04 - - - - - - - ADOPTION >>
- i) Click on compare button

In the following exercise not all concepts can be found. How would you express the concept? Which terms that you did find do you think should have had a relationship to your term? Remember that the ELSSST thesaurus is a broad-based thesaurus so a specific concept may be covered by a broader theme.

4) The theme is a forthcoming general election

- a) How do people intend to vote?
- b) Which parties do people associate with?
- c) Are they bothered to vote?
- d) Do they belong to a political party?
- e) Would they consider tactical voting?
- f) What issues do they consider important?
- g) Do you believe the system of voting is correct?

h)-z) Any further questions you can think of - however please write them out fully on your answer sheet.

5) Search on concepts found - display keywords and their equivalents in your chosen language. Record how accurate you consider the translation and how useful the complete list is in understanding what the survey is about.

6) Review one or more of the three political hierarchies: - political institutions (POLITISCHE INSTITUTIONEN, INSTITUCIONES POLITICAS), political systems (POLITISCHE SYSTEME, SISTEMAS POLITICOS) or politics (POLITIK, POLITICA) in German or Spanish and compare structures. For those who prefer French two hierarchies have been translated - economics (ECONOMIE) or labour and employment (TRAVAIL ET EMPLOI). Record any comments on structure or translations.

Appendix 3 ELSST Evaluation Exercise Sep 2001

* After completing all the exercises, please fill in the ELSST Evaluation sheet at the end of the sheet *

1. Six ways of using the thesaurus to help define concepts:

1(a) Kwic listing. E.g. COURSES

1. Select thesaurus (this is the default option on the drop down list)
2. Set language to English (this is the default language)
3. Type COURSES in term field
4. Click search
5. What you get is a list of all the terms in the thesaurus with the string "COURSES" in them (i.e. the Kwic listing).
CORRESPONDENCE COURSES
EDUCATIONAL COURSES
OPEN COLLEGE COURSES
OPEN UNIVERSITY COURSES
PART-TIME COURSES
TRAINING COURSES
UNIVERSITY COURSES
6. Notice that preferred terms are distinguished from non-preferred terms. Non-preferred terms (e.g. CORRESPONDENCE COURSES) have USE and their preferred terms after them, while preferred terms (e.g. EDUCATIONAL COURSES) have their (Classification) Code after them.
7. Click on DISTANCE LEARNING to look at the thesaurus entry for DISTANCE LEARNING
8. Click new term button to return to the main menu.

1(b) Synonyms E.g. SOCIAL SECURITY

1. Select thesaurus
2. Set language to English
3. Type SOCIAL SECURITY in term field
4. Click search
5. Look at synonyms (UFs)
UF NATIONAL INSURANCE
UF SOCIAL INSURANCE
6. Click new term to return to main menu.

1(c) Broader term and all Narrower terms of that term. E.g.

1. Select thesaurus
2. Set language to English
3. Type EDUCATIONAL COURSES in term field
4. Click search
5. Look at broader terms (BTs) and narrower terms (NTs)
NT DISTANCE LEARNING
NT PART-TIME COURSES
NT TRAINING COURSES
NT UNIVERSITY COURSES
BT EDUCATION
6. Notice the scope note
7. The top term (TT) EDUCATION is also indicated
8. Click new term to return to main menu.

1(d) Full hierarchy E.g. BUSINESSES

1. Look at the (scrollable) list of alphabetical terms. This is the list of top terms
2. Click on BUSINESSES in the list of top terms
3. Click on any "NT" symbol in the left hand column (this gives you the full hierarchy)
4. Click on the empty box labelled 01 directly under BUSINESSES (this gives you all the first level terms)
5. You will notice the symbol >> after PUBLIC UTILITIES (this indicates that there are further NTs)
6. Click on the term 01 PUBLIC UTILITIES (this gives you all the first and second level terms)

BUSINESSES

AGRICULTURAL ENTERPRISES
COMPANIES
COOPERATIVES
FRANCHISES (BUSINESS)
INDUSTRIAL ENTERPRISES
PARTNERSHIPS (BUSINESS)
PUBLIC ENTERPRISES
PUBLIC UTILITIES
 ELECTRIC POWER SUPPLY
 GAS SUPPLY
 WATER SUPPLY
SMALL BUSINESSES
TRANSNATIONAL ENTERPRISES

7. Click return and new term to return to main menu.

1(e) Related terms E.g. SOCIAL CLASS

1. Enter SOCIAL CLASS
2. Click search
3. Look at related terms (RTs)
RT CLASS CONFLICT
RT CLASS DIFFERENTIATION
4. Click new term to return to main menu.

1(f) Standalone terms

1. Click Standalone button in the bottom right hand corner.
2. This gives you a list of the 49 hierarchies.
3. Notice the “Possible no. of NTs” in the right hand column – this indicates the number of NTs this term has in Hasset.
4. Click on return to return to main menu

2. Comparing different language versions.

- Find equivalent term in other languages
 1. Enter term E.g. RACISM
 2. Click on search button
 3. Click on equiv(alent) button
 4. Look at the term and its equivalents in other languages
RACISM
RACISME
RASSISMUS
RACISMO
 5. Click on return and new term to return to main menu
- Compare hierarchies:
 1. Set language to Spanish
 2. Click on NEGOCIOS from list of top terms
 3. Click on any of the NT symbols in the left hand column
 4. Click on the compare button (This shows Spanish and English hierarchies)
 5. Click return, return and new term to return to main menu.

3. Search metadata, expand and display keywords and their equivalents.

1. Set language to English
2. Set search to Controlled Vocabulary
3. Enter DISCRIMINATION
4. Click search button (This shows all the datasets indexed with DISCRIMINATION)
5. Notice the number of hits at the bottom of the page (68)
6. Click expand search button
7. In the Extended Search drop down list select “Plus all NTs” (This shows all datasets indexed with DISCRIMINATION and its NTs)
8. Notice the number of hits at the bottom of the page (153)
9. Select a dataset
10. Click on Keywords (This shows the full list of keywords with which the dataset has been indexed)
11. Click on French, German or Spanish (This shows the list of keywords translated into French, German or Spanish)

4. Exploring the Labour Force Survey

Imagine that you are interested in the following questions.

- (a) Do the employers offer a pension scheme?
- (b) Are there any safety provisions at the place of work?
- (c) Do the employers offer any provision for child care?
- (d) How many days of employment are lost due to stress?

Try to find out which questions are covered in the Quarterly Labour Force Survey September – November 1999.

Return to main menu and perform the following commands:

1. *Select English*
2. *Select thesaurus*

Try to find appropriate keyword queries for questions (a) – (d) above. Remember that (a) if you cannot find a term in the thesaurus, you may have to use a synonym to express the concept (b) very specific terms will not be found in ELSST, since it is a broad-based thesaurus. In this case, use a broader term to cover a specific concept.

Please make a note of any terms you find in the table below. Please feel free to suggest terms that you think should be in ELSST and are not, or make any other comment you like.

Question Number	Term(s) found In ELSST	Term(s) not found in ELSST	Other Comments

You can check to see whether the Quarterly Labour Force Survey September – November 1999 has been indexed with your chosen terms by returning to the main menu and performing the following commands:

1. *Select English*
2. *Select controlled vocabulary*
3. *Enter term EMPLOYMENT*
4. *Click search*
5. *Select Quarterly Labour Force Survey September – November 1999*
6. *Click Keywords*

5. Review one or more hierarchies

1. Return to main menu
2. Select a top term and generate its hierarchy as described in 1(d) above.
3. Record any comments on its structure or content in the table below.

Hierarchy	Any term or relation (UF, BT, NT, RT) relation that should not be in this hierarchy	Any missing term or relation (UF, BT, NT, RT)	Any other Comments

Hierarchy	Any term or relation that should not be in this hierarchy	Any missing term or relation (UF, BT, NT, RT)	Any other Comments

ELSST Evaluation Score

Strongly
agree

Strongly
disagree

1. The hierarchies are well structured

1	2	3	4	5

2. The depth of hierarchies is too shallow

1	2	3	4	5

3. The depth of the hierarchies is about right

1	2	3	4	5

4. There are too many missing terms

1	2	3	4	5

5. The thesaurus provides good coverage of the domain

1	2	3	4	5

6. The number of scope notes is inadequate

1	2	3	4	5

7. The scope notes are useful

1	2	3	4	5

8. There are too few synonyms

1	2	3	4	5

9. I would find the thesaurus useful for indexing/retrieval purposes

1	2	3	4	5

Appendix 4 Evaluation Criteria from Lorraine Toews

Evaluation Criteria from Lorraine Toews “An Evaluation Methodology for Clinical Vocabularies and Evaluation of the Read Codes.” (<http://www.ualberta.ca/dept/slis/cais/toews.htm>)

Coverage

Scope

Is the vocabulary capable of representing all of the concepts found in the complete patient record? Does the vocabulary have the terms necessary to represent the full range of health problems in various health care settings ie. acute care, long term care, community care? Does the vocabulary encompass the terminology used to describe the various diagnostic and therapeutic procedures performed by different care providers and speciality groups? Does the vocabulary use terms that are commonly used by care providers? Does the vocabulary include related terms, as well as synonyms and variant forms of terms? Does the vocabulary include modifiers or qualifiers that express the certainty, degree, or severity of a process? Is the vocabulary able to represent time intervals? Are users able to add terms to the vocabulary in order to meet local needs?

Specificity

Is the vocabulary specific enough to accurately represent the many aspects of health care reality? Is there minimal loss of clinical detail when data are encoded in the vocabulary? Does the vocabulary capture information in sufficient detail to support efficient statistical reporting for research and policy development purposes? What is the proportion of atomic to precoordinated terms in the vocabulary?

Structure

Are the vocabulary hierarchies logical and complete? Are the meanings of terms clearly defined, either by their position in a hierarchy or by a scope note? Does the vocabulary divorce the hierarchical arrangement of a concept from its unique identifier? Does the vocabulary contain redundant terms? Are there explicit rules for combining terms, or for combining terms and qualifiers? Does the vocabulary allow for multiple classification of terms, that is, can terms appear in more than one hierarchy?

Maintenance

Does the vocabulary have ongoing institutional support? Does the institution or body that developed the vocabulary have stable funding? Does this institution or body regularly evaluate and update the vocabulary? Does this agency regularly consult with users of the vocabulary on a formal or informal basis in order to obtain feedback?

Usability

Is the vocabulary electronically mapped to other major clinical vocabularies? Does the vocabulary meet the needs of a range of end users? Does the user interface facilitate optimal use of the vocabulary with minimal training?

Appendix 5 Discussion of translation problems in ELSST

Translation problems in ELSST

1. Introduction

This document discusses translation problems in ELSST, including the problem of translation mismatches.

In Section 2 we define what we mean by “translation mismatches” in ELSST, and describe different strategies for dealing with them. In Sections 3 to 6 we give examples of the different categories of mismatch for English to Spanish, English to German and English to French¹. Other translation problems are discussed in Section 7. Section 8 describes related projects in further detail.

2. Definition of translation mismatches in ELSST

We begin by reviewing the five categories of equivalence between source language terms and target language terms recognised by ISO 5964 (1985):

- Exact equivalence: This is where source and target language terms refer to the same concept.
- Inexact equivalence: This is where source and target language terms are generally regarded as denoting the same sets of objects or phenomena (e.g. they are frequently represented as equivalents in translation dictionaries), but the membership of these sets is slightly different (e.g. “Gedeck” in German → “Menu” in English).
- Partial equivalence: This is where source and target language terms are generally regarded as referring to the same concept, but one of the terms strictly denotes a slightly broader or narrower concept (e.g. “Wissenschaft” in German → “science” in English).
- Single-to-multiple equivalence: This covers one of three scenarios: (i) a concept represented by a term in the source language is not recognised as a single idea by the users of the target language. Instead, it is regarded as consisting of two or more different concepts, each of which is represented by its own specific term (e.g. “fuels” in English → “carburants + “combustibles” in French); (ii) a compound term in the source language represents a concept which is expressed by two or more separate terms in the target language, and the source language term can be factored syntactically into components which, re-expressed as nouns if necessary, are then exact equivalents to the existing terms in the target language (e.g. “solar heating” in English → “chauffage” + “energie solaire” in French); (iii) a term in the source language refers to a category that has not evolved, for cultural or linguistic reasons, in the target language (e.g. “Schnecke” in German → “slugs” + “snails” in English).
- Non-equivalence: This is where (i) a term in the source language expresses an abstract and frequently culture-dependent concept which, at least initially, is unknown to the users of the target language (e.g. “Berufsverbot” in German → ? in English) or (ii) a newly-developed process, operation or equipment, notably in the sciences or technology, are named in the language of their inventors, and have not yet acquired vernacular names in the other languages (e.g. “steam cracking” in English → ? in French)

A useful way of thinking about these equivalence expressions is in terms of set relations. Doerr (2001) interprets the equivalence expressions as concept-based mappings, i.e. as set relations of the associated sets of objects. He defines the equivalence relations as follows:

1. “Partial equivalence” becomes “broader equivalence” (is subset of) or “narrower equivalence” (is superset of)
2. “Exact equivalence” is interpreted as “same set as”
3. “Inexact equivalence” is interpreted as “overlaps with”

¹ It should be noted that these categories are not mutually exclusive. Thus, some cases of single to multiple equivalence, for example, may also be regarded as cases of partial or inexact equivalence.

4. "Single to multiple equivalence" becomes "*equivalence" to "compound", where "compound" is a Boolean expression of target terms with AND, OR, NOT and "*" is either "exact", or "broader" or "narrower".

The Getty Information Institute (1996) proposed the following notation:

- +/- inexact equivalence
- < for broader equivalence
- > for narrower equivalence
- + for AND combinations
- & for OR combinations

In ELSST, we adopt the ISO classification, as interpreted by Doerr (2001), and the following notation for single to multiple equivalences:

- + for AND combinations
- & for OR combinations

3. Cases of Partial equivalence

Partial equivalences can be translated by a broader or narrower term, plus, optionally, a scope note.

Cases of Partial equivalence include the following:

3.1 English-Spanish

"SMELL" in English → "MAL OLOR" in Spanish.

3.2 English-German

"VOCATIONAL EDUCATION" in English → "BERUFSBILDUNG" in German

SN: "VOCATIONAL EDUCATION" BEZIEHT SICH VORWIEGEND AUF DEN SCHULISCHEN ASPEKT EINER AUSBILDUNG, KANN IN G.B. ABER AUCH EINE PRAKTISCHE AUSBILDUNG MITEINSCHLIESSEN.

3.3 English-French

"INFANTS" in English → "JEUNES ENFANTS" in French

SN : LE TERME "INFANTS" S'APPLIQUE NORMALEMENT AUX JEUNES ENFANTS JUSQU'A L'AGE DE 5 ANS, OU AUX ECOLIERS DE 5 A 7 ANS.

4. Cases of inexact equivalence

Cases of inexact equivalence are translated by a near equivalent term, plus, optionally, a scope note.

4.1 English-Spanish

"PUBLIC HOUSING" in English → "VIVIENDA SOCIAL" in Spanish

SN : CUALQUIER TIPO DE VIVIENDA SUBVENCIONADA CON FONDOS PUBLICOS.

4.2 English-German

"PRIVATE SCHOOLS" in English → "PRIVATSCHULEN" in German

SN: ANDERS ALS PRIVATSCHULEN IN DEUTSCHLAND VERMITTELN PRIVATSCHULEN IN G.B. EINE ALLGEMEIN BESSERE UND HOCHWERTIGERE AUSBILDUNG ALS ÖFFENTLICHE SCHULEN.

4.3 English-French

"PROFESSIONAL OCCUPATIONS" in English → "PROFESSIONS LIBERALES" in French.

SN: LE TERME "PROFESSIONS" EN ANGLAIS S'APPLIQUE AUX METIERS DE CARATERE INTELLECTUEL OU TECHNIQUE QUI REPOSENT SUR UNE FORMATION POUSSÉE.

5. Cases of single to multiple equivalence

Cases of non-equivalence can be dealt with through combined terms: This is the preferred option:²

5.1 English-Spanish

"FUELS" in English → "CARBURANTES & COMBUSTIBLES" in Spanish.

5.2 English-German

"SINGLE-SEX SCHOOLS" in English → "JUNGENSCHULEN & MÄDCHENSCHULEN" in German.

5.3 English-French

"DRUGS" in English → "DROGUES" & "MÉDICAMENTS" in French.

6. Cases of non-equivalence

Cases of non-equivalence can be translated by:

6.1 a coined term or paraphrase:

6.1.1 English-Spanish

"SELF-COMPLETION" in English → "AUTOCUMPLIMIENTO" in Spanish.

6.1.2 English-German

"SELECTIVE SCHOOLS" in English → "SCHULEN MIT AUSWAHLVERFAHREN" in German.

6.1.3 English-French

"COLLEGES" in English → "ÉTABLISSEMENTS D'ENSEIGNEMENT SUPÉRIEUR" in French

6.2 a loanword:

6.2.1 English-Spanish

none used.

6.2.2 English-German

"COLLEGES" in English → "COLLEGES" in German

6.2.3 English-French

"INNER CITIES" in English → "INNER CITIES" in French

6.3 a closely related term in the target language, plus, optionally, a scope note (i.e. treating them as if they are partial equivalences). Examples include the following:

6.3.1 English-Spanish

"HOMELESSNESS" in English → "DESAMPARADOS" in Spanish.

6.3.2 English-German

² Another option, though not discussed in ISO 5964, but adopted in other multilingual thesauri, such as STATSCAN for translating cases where the source term corresponds to more than one term in the target language, is to choose one of the target terms as the preferred term and let the other target term(s) be UFs. An example would be:

"DRUG ABUSE" in English → "ABUS DES DROGUES" in French
UF = "ABUS DES MÉDICAMENTS"

"HOSTAGE-HOLDING" in English → "GEISELNAHME" in German

SN: IM DEUTSCHEN GIBT ES KEIN SUBSTANTIV FÜR "HOSTAGE-HOLDING".
"GEISELNAHME" BEDEUTET GENAU GENOMMEN "HOSTAGE TAKING".

6.3.3 English-French

"HOMELESSNESS" in English → "SANS DOMICILE FIXE" in French.

SN: IL N'Y A PAS DE NOM FRANCAIS POUR L'ETAT D'ETRE SANS ABRI.

7. Other translation problems.

7.1 The translation in the target language is ambiguous in a way that the source language term is not. The term's place in its hierarchy may serve to disambiguate it. Alternatively, a qualifier may be added to the term. Qualifiers are obligatory for homographs (see example 7.1.2). Examples include the following:

English-Spanish

"HI-JACKING" → "SECUESTRO (VEHICULOS) in Spanish

7.1.2 English-German

"HI-JACKING" in English → "ENTFÜHRUNG (OBJEKTE)" in German

"KIDNAPPING" in English → "ENTFÜHRUNG (PERSONEN)" in German

7.1.3 English-French

"ADVICE" in English → "CONSEIL (AVIS)" in French

Alternatively, a scope note may be added. For example,
"EQUIPMENT" in English → "EQUIPO" in Spanish

SN: SOLAMENTE REFERIDO AL CONJUNTO DE APARATOS, MAQUINARIA Y/O
UTENSILIOS, NO COMO CONJUNTO DE PERSONAS

7.2 Translating UFs

Where there is a non-equivalence for the UFs there is no way of commenting on the problem. In cases like this, the term is often best left untranslated. For example, there is no equivalent to "TEENAGERS" in French.

8. Related projects

Other projects which have attempted to capture partial equivalences in multilingual thesauri and other linguistic resources include the following:

8.1 MACS (Multilingual access to subjects) project (<http://infolab.kub.nl/prj/macs/>) aims to provide multilingual subject access to library catalogues. Equivalence links have been created between the three indexing languages: Schlagwortnormdatei (SWD) (for German), RAMEAU (for French) and Library of Congress Subject Headings (LCSH) (for English). A discussion of mapping techniques is given in: <http://infolab.kub.nl/prj/macs/pub/architecture.pdf>

8.2 HEREIN project: <http://www.european-heritage.net/en/index.html> is producing a multilingual thesaurus for architectural and archaeological heritage. It follows the equivalence relations of ISO 5964. The languages covered will initially be English, Spanish and French. The lists of terms were created separately for all three languages, then correspondences were established.

8.3 Merimee project: <http://www.culture.gouv.fr/documentation/thesarch/pres.htm> establishes equivalence relations between the Art & Architecture Thesaurus (AAT) and the English 8.4 Heritage Thesaurus (formerly RCHME) (http://www.rchme.gov.uk/thesaurus/mon_types/default.htm). These relations are similar to

those in ISO 5964. Examples of, and statistics related to, these mappings can be found in Doerr (2001).

References

Doerr, M., 2001: Semantic Problems of Thesaurus Mapping, in Journal of Digital Information, Vol. 1, issue 8.

Getty Information Institute: Guidelines for Forming Language Equivalents: A Model Based on the Art & Architecture Thesaurus <http://www.chin.gc.ca/Resources/Publications/Guidelines/English/HEREIN> project: <http://www.european-heritage.net/en/index.html>

ISO 5964-1985, (1985): Documentation – Guidelines for the establishment and development of multilingual thesauri, International Organization for Standardization, Ref. No. ISO 5964-1985.

MACS project, <http://infolab.kub.nl/prj/macs/>

STATSCAN thesaurus, http://www.statcan.ca/francais/search/thesaurus_f.htm

Appendix 6 Translation mismatches for English-Spanish

<i>TERM</i>	<i>HIERARCHY</i>	<i>TRANSLATION PROBLEM</i>	<i>PROPOSED SOLUTION</i>	<i>TRANSLATION</i>
LECTURES	EDUCATION	non equivalence	near equivalent term	CLASES DE UNIVERSIDAD
PUBLIC HOUSING	SOCIAL WELFARE	inexact equivalence	add scope note	VIVIENDA SOCIAL
HOMEMAKERS	SOCIAL STRUCTURE	inexact equivalence	near equivalent term	SUS LABORES
DRUGS	STANDALONES	single to multiple equivalence	combined term	DROGAS & MEDICAMENTOS
FUELS	STANDALONES	single to multiple equivalence	combined term	CARBURANTES & COMBUSTIBLES
HOMELESSNESS	SOCIAL PROBLEMS	non equivalence	near equivalent term	DESAMPARADOS
DRUG ADDICTION	ADDICTION	partial equivalence	narrower term	TOXICOMANIA
KIDNAPPING	OFFENCES	partial equivalence	add qualifier	SECUESTRO (PERSONAS)
HI-JACKING	OFFENCES	partial equivalence	add qualifier	SECUESTRO (VEHICULOS)
EQUIPMENT	EQUIPMENT	ambiguous term	add scope note	EQUIPO
SELF-COMPLETION	METHODOLOGY	non equivalence	coined term	AUTOCUMPLIMIENTO
JOB SHARING	LABOUR AND EMPLOYMENT	non equivalence	paraphrase	PUESTO DE TRABAJO COMPARTIDO
SMELL	ENVIRONMENTAL CHANGES	partial equivalence	narrower term	MAL OLOR
TESTS	STANDALONES	partial equivalence	broader term	PRUEBAS
PRISONERS	CRIME	partial equivalence	broader term	PRISIONEROS

scope notes :

VIVIENDA SOCIAL : CUALQUIER TIPO DE VIVIENDA SUBVENCIONADA CON FONDOS PUBLICOS

EQUIPO : SOLAMENTE REFERIDO AL CONJUNTO DE APARATOS, MAQUINARIA Y/O UTENSILIOS, NO COMO CONJUNTO DE PERSONAS

Appendix 7 Translation mismatches for English-German

<i>TERM</i>	<i>HIERARCHY</i>	<i>TRANSLATION PROBLEM</i>	<i>PROPOSED SOLUTION</i>	<i>TRANSLATION</i>
COLLEGES	EDUCATION	non-equivalence	loanword	COLLEGES
SELECTIVE SCHOOLS	EDUCATION	non-equivalence	paraphrase	SCHULEN MIT AUSWAHLVERFAHREN
PRIVATE SCHOOLS	EDUCATION	inexact equivalence	near equivalent term + scope note	PRIVATSCHULEN
SINGLE-SEX SCHOOLS	EDUCATION	single-to-multiple equivalence	combined term	JUNGENSCHULEN & MÄDCHENSCHULEN
HOMEMAKERS	LABOUR AND EMPLOYMENT	single-to-multiple equivalence	combined term	HAUSFRAUEN & HAUSMÄNNER
DRUGS	PRODUCTS	single-to-multiple equivalence	combined term	DROGEN & MEDIKAMENTE
DRUG ABUSE	ADDICTION	single-to-multiple equivalence	combined term	DROGENMISSBRAUCH & MEDIKAMENTENMISSBRAUCH
DRUG ADDICTION	ADDICTION	single-to-multiple equivalence	combined term	DROGENABHÄNGIGKEIT & MEDIKAMENTENABHÄNGIGKEIT
KIDNAPPING	OFFENCES	partial equivalence	add qualifier	ENTFÜHRUNG (PERSONEN)
HIJACKING	OFFENCES	partial equivalence	add qualifier	ENTFÜHRUNG (OBJEKTE)
VOCATIONAL EDUCATION	EDUCATION	partial equivalence	near equivalent term + scope note	BERUFSBILDUNG
HOUSING TENURE	PROPERTY, OWNERSHIP AND TENURE	single-to-multiple equivalence	combined term	WOHNUNGSEIGENTUM & WOHNRECHT
LAND TENURE	PROPERTY, OWNERSHIP AND TENURE	single-to-multiple equivalence	combined term	LANDBESITZ & LANDNUTZUNGSRECHT
TERTIARY EDUCATION	EDUCATION	single-to-multiple equivalence	combined term	HÖHERE BILDUNG & WEITERBILDUNG
SPECIAL SCHOOLS	EDUCATION	single-to-multiple equivalence	combined term	SONDERSCHULEN & SCHULEN FÜR HOCHBEGABTE

SPECIAL EDUCATION	EDUCATION	single-to-multiple equivalence	combined term	SONDERPÄDAGOGIK & HOCHBEGABTENFÖRDERUNG
SPORTSPERSONS	STANDALONE	single-to-multiple equivalence	combined term	SPORTLER & SPORTLERINNEN
VETERINARY SURGEONS	STANDALONE	single-to-multiple equivalence	combined term	TIERÄRZTE
WORKERS	ECONOMICS	single-to-multiple equivalence	combined term	ARBEITER
JOB SHARING	LABOUR AND EMPLOYMENT	non-equivalence	loanword	JOB SHARING
HOSTAGE-HOLDING	OFFENCES	non-equivalence	near equivalent term + scope note	GEISELNAHME
NON-PROFESSIONAL OCCUPATIONS	OCCUPATIONS	non-equivalence	paraphrase	BERUFE, DIE KEINEN HÖHEREN ABSCHLUSS VORAUSSETZEN
COMPUTER SOFTWARE	STANDALONE	non-equivalence	loanword	COMPUTER SOFTWARE
RECRUITMENT	LABOUR AND EMPLOYMENT	ambiguous term	add qualifier	EINSTELLUNG (ANGESTELLTE)
ATTITUDES	ATTITUDES	ambiguous term	add qualifier	EINSTELLUNGEN (MEINUNGEN)

scope notes:

PRIVATSCHULEN: ANDERS ALS PRIVATSCHULEN IN DEUTSCHLAND VERMITTELN PRIVATSCHULEN IN G.B. EINE ALLGEMEIN BESSERE UND HOCHWERTIGERE AUSBILDUNG ALS ÖFFENTLICHE SCHULEN.

BERUFSBILDUNG: "VOCATIONAL EDUCATION" BEZIEHT SICH VORWIEGEND AUF DEN SCHULISCHEN ASPEKT EINER AUSBILDUNG, KANN IN G.B. ABER AUCH EINE PRAKTISCHE AUSBILDUNG MITEINSCHLIESSEN.

GEISELNAHME: IM DEUTSCHEN GIBT ES KEIN SUBSTANTIV FÜR "HOSTAGE-HOLDING". "GEISELNAHME" BEDEUTET GENAU GENOMMEN "HOSTAGE TAKING".

Appendix 8 Translation mismatches for English-French

<i>TERM</i>	<i>HIERARCHY</i>	<i>TRANSLATION PROBLEM</i>	<i>PROPOSED SOLUTION</i>	<i>TRANSLATION</i>
COLLEGES	EDUCATION	non-equivalence	paraphrase	ETABLISSEMENTS D' ENSEIGNEMENT SUPERIEUR
PROFESSIONS	EDUCATION	inexact equivalence	near equivalent term + scope note	PROFESSIONS LIBERALES
DRUGS	PRODUCTS	single to multiple equivalence	combined term	DROGUES & MEDICAMENTS
DRUG ABUSE	ADDICTION	single to multiple equivalence	combined term	ABUS DES DROGUES & ABUS DES MEDICAMENTS
FUELS	STANDALONES	single to multiple equivalence	combined term	COMBUSTIBLES & CARBURANTS
FUEL RESOURCES	RESOURCES	single to multiple equivalence	combined term	RESSOURCES EN COMBUSTIBLES & RESSOURCES EN CARBURANTS
INFANTS	AGE GROUPS	partial equivalence	near equivalent term + scope note	JEUNES ENFANTS
ADVICE	STANDALONES	ambiguous term	add qualifier	CONSEIL (AVIS)
FURTHER EDUCATION	EDUCATION	non-equivalence	Paraphrase	ENSEIGNEMENT POSTSECONDAIRE NON-ACADEMIQUE
COMPANIES	BUSINESSES	ambiguous term	add qualifier	SOCIETES (ECONOMIE)
HOMELESSNESS	SOCIAL DISADVANTAGE	non-equivalence	near equivalent term + scope note	SANS DOMICILE FIXE

scope notes

PROFESSIONS LIBERALES: LE TERME "PROFESSIONS" EN ANGLAIS S'APPLIQUE AUX METIERS DE CARATERE INTELLECTUEL OU TECHNIQUE QUI REPOSENT SUR UNE FORMATION PUSSEE.

INFANTS: LE TERME "INFANTS" S'APPLIQUE NORMALEMENT AUX JEUNES ENFANTS JUSQU'A L'AGE DE 5 ANS, OU AUX ECOLIERS DE 5 A 7 ANS.

SANS DOMICILE FIXE : IL N'Y A PAS DE NOM FRANCAIS POUR L'ETAT D'ETRE SANS ABRI.

Appendix 9 A comparison of ELSST and EUROVOC

A legitimate question to ask is why did we need to develop a new thesaurus for LIMBER. Why did we not just adopt an existing one? A possible candidate that has been suggested is the EUROVOC thesaurus of the European Commission. Below we present a comparison of the two thesauri. The conclusion we reach is that EUROVOC as it stands would not meet our needs, and that it would have taken as long, if not longer, to adapt it to our needs as it took to adapt HASSET, which we used as a starting point for ELSST. We further argue that there were additional advantages to basing ELSST on HASSET rather than some other general purpose thesaurus.

ELSST and EUROVOC differ in the user groups that they target. ELSST was designed to meet the needs of a particular community, namely the Council of European Social Science Data Archives (CESSDA) community, which promotes the acquisition, archiving and distribution of electronic data for social science teaching and research in Europe. It is hoped that ELSST will be adopted by the CESSDA community and others to index their holdings. EUROVOC was designed to provide a means of indexing the documents in the documentation systems of the European institutions and of their users and is currently used by the European Parliament, the Office for Official Publications of the European Communities, national and regional parliaments in Europe, national government departments and certain European organisations.

Another difference is that ELSST is designed to be a broad-based thesaurus, which means that very narrow, specific terms are avoided. No such claim is made for EUROVOC, which has very low level terms in comparison with ELSST.

ELSST also aims to be culture and institution neutral. EUROVOC, by contrast, is very strongly geared to the institutions for which it is developed, i.e. the institutions of the EU.

All these differences affect the coverage and scope of the two thesauri, which we discuss below.

While ELSST is restricted to the social science domain, EUROVOC has a much wider coverage. This can be seen in the 127 topic areas (called microthesauri) covered by EUROVOC (see Appendix 10 EUROVOC microthesauri grouped by topic cluster). This list contains technical areas such as “iron, steel and other metal industries” and “electronics and electrical engineering”. While these areas are of central importance to the EU, which started life as the European Coal and Steel Community, they are peripheral to the concerns of a social science thesaurus.

Other areas that are covered in depth by EUROVOC but hardly touched by ELSST include international organizations, transport, natural and applied sciences, agriculture, forestry and fisheries, energy, agri-foodstuffs, production, technology and research, and geography. Again, most of these are of central importance to the business of the EU, but not necessarily to the CESSDA community.

On the other hand, an area covered by ELSST that has very scant coverage in EUROVOC is statistics. This hierarchy was included at the behest of CESSDA members.

Unlike ELSST, which seeks to eliminate all institution-specific bias, EUROVOC has a cluster of microthesauri that are institution-specific, namely the European Communities cluster. Certain microthesauri in other clusters are also EU-specific, e.g. “Regions of the Community Countries” in the Geography cluster.

There is however considerable overlap in the subject areas covered by both thesauri. EUROVOC and ELSST both cover the following: politics, international relations, law, economics, trade, finance, social questions, education and communications, business and competition, employment and working conditions, and the environment. Even in these areas,

however, there are differences in scope and emphasis. For example, EUROVOC covers sub-topics such as tariff policy and insurance in much greater detail than ELSST.

If we compare the “social welfare” hierarchy in ELSST (see Appendix 12 The social welfare hierarchy in ELSST) with the “social protection” microthesaurus in EUROVOC (see Appendix 11 Social protection microthesaurus in EUROVOC) we see some interesting differences. While EUROVOC goes into greater depth in the field of social security benefit (e.g. additional benefit, death grant, maternity benefit, survivor’s benefit), ELSST has more terms relating to welfare (e.g. child welfare, care in the community, residential care of the sick, etc.). Note also that EUROVOC has some terms relating to the administrative side of the EU activity, namely “social security legislation”, and “social-security harmonization”.

As another example, the “social framework” microthesaurus in EUROVOC (see Appendix 13 The “social framework” hierarchy in EUROVOC) distinguishes many more types of social classes (e.g. peasant class, sub-proletariat, socially disadvantaged class) than its equivalent hierarchy (“social structure”) in ELSST (see Appendix 14 The “social structure” hierarchy in ELSST). ELSST, on the other hand, contains more terms relating to social distinctions according to gender and class (e.g. gender role, women’s role, class differentiation).

Such differences in emphasis can be observed across many other hierarchies in the two thesauri. Thus it is not just a question of EUROVOC having broader coverage and treating topics in greater depth than ELSST. In some cases, it is ELSST that has more detailed coverage of a topic than EUROVOC. The task of reducing ELSST from EUROVOC would therefore not have been particularly straightforward.

ELSST was derived from HASSET, the in-house thesaurus of the UKDA. The advantages of using this thesaurus, as opposed to any other more general purpose thesaurus, is that it has been tuned to the holdings of the UKDA over a period of nearly 10 years. This made it an ideal starting point for creating a thesaurus for the CESSDA community. The developers of ELSST had access not just to HASSET itself but to information on the amount of times each term had been used for indexing. This gave some idea about how central the terms were in the thesaurus. The problem of adaptation could then be defined as a matter of removing all hierarchies outside the social science domain and all cultural and institution specific terms within the social science domain (although in the event, some restructuring of the thesaurus was also required), as well as adding extra hierarchies for methodology, etc. Choices about which terms to include and which not to, were influenced by the amount of times the terms had been used for indexing.

Another advantage of using HASSET is that there were no copyright problems to deal with. This made it a straightforward matter to adapt it to RDF format, which was one of the aims in the LIMBER project.

In conclusion, we feel that the choice of HASSET, as opposed to EUROVOC or some other general purpose thesaurus, was the best basis for creating ELSST.

Appendix 10 EUROVOC microthesauri grouped by topic cluster

04 POLITICS

- [0406 political framework](#)
- [0411 political party](#)
- [0416 electoral procedure and voting](#)
- [0421 parliament](#)
- [0426 parliamentary proceedings](#)
- [0431 politics and public safety](#)
- [0436 executive power and public service](#)

08 INTERNATIONAL RELATIONS

- [0806 international affairs](#)
- [0811 cooperation policy](#)
- [0816 international balance](#)
- [0821 defence](#)

10 EUROPEAN COMMUNITIES

- [1006 Community institutions and European civil service](#)
- [1011 Community law](#)
- [1016 European construction](#)
- [1021 Community finance](#)

12 LAW

- [1206 sources and branches of the law](#)
- [1211 civil law](#)
- [1216 criminal law](#)
- [1221 justice](#)
- [1226 organization of the legal system](#)
- [1231 international law](#)
- [1236 rights and freedoms](#)

16 ECONOMICS

- [1606 economic policy](#)
- [1611 economic growth](#)
- [1616 regions and regional policy](#)
- [1621 economic structure](#)
- [1626 national accounts](#)
- [1631 economic analysis](#)

20 TRADE

- [2006 trade policy](#)
- [2011 tariff policy](#)
- [2016 trade](#)
- [2021 international trade](#)
- [2026 consumption](#)
- [2031 marketing](#)
- [2036 distributive trades](#)

24 FINANCE

- [2406 monetary relations](#)
- [2411 monetary economics](#)
- [2416 credit and financial institutions](#)
- [2421 free movement of capital](#)
- [2426 financing and investment](#)
- [2431 insurance](#)
- [2436 public finance and budget policy](#)
- [2441 budget](#)

[2446 taxation](#)
[2451 prices](#)

28 SOCIAL QUESTIONS

[2806 family](#)
[2811 migration](#)
[2816 demography and population](#)
[2821 social framework](#)
[2826 social affairs](#)
[2831 culture and religion](#)
[2836 social protection](#)
[2841 health](#)
[2846 construction and town planning](#)

32 EDUCATION AND COMMUNICATIONS

[3206 education](#)
[3211 teaching](#)
[3216 organization of teaching](#)
[3221 documentation](#)
[3226 communications](#)
[3231 information and information processing](#)
[3236 information technology and data processing](#)

36 SCIENCE

[3606 natural and applied sciences](#)
[3611 humanities](#)

40 BUSINESS AND COMPETITION

[4006 business organization](#)
[4011 business classification](#)
[4016 legal form of organizations](#)
[4021 management](#)
[4026 accounting](#)
[4031 competition](#)

44 EMPLOYMENT AND WORKING CONDITIONS

[4406 employment](#)
[4411 labour market](#)
[4416 organization of work and working conditions](#)
[4421 personnel management and staff remuneration](#)
[4426 labour law and labour relations](#)

48 TRANSPORT

[4806 transport policy](#)
[4811 organization of transport](#)
[4816 land transport](#)
[4821 maritime and inland waterway transport](#)
[4826 air and space transport](#)

52 ENVIRONMENT

[5206 environmental policy](#)
[5211 natural environment](#)
[5216 deterioration of the environment](#)

56 AGRICULTURE, FORESTRY AND FISHERIES

[5606 agricultural policy](#)
[5611 agricultural structures and production](#)
[5616 farming systems](#)
[5621 cultivation of agricultural land](#)
[5626 means of agricultural production](#)

[5631 agricultural activity](#)
[5636 forestry](#)
[5641 fisheries](#)

60 AGRI-FOODSTUFFS

[6006 plant product](#)
[6011 animal product](#)
[6016 processed agricultural produce](#)
[6021 beverages and sugar](#)
[6026 foodstuff](#)
[6031 agri-foodstuffs](#)
[6036 food technology](#)

64 PRODUCTION, TECHNOLOGY AND RESEARCH

[6406 production](#)
[6411 technology and technical regulations](#)
[6416 research and intellectual property](#)

66 ENERGY

[6606 energy policy](#)
[6611 coal and mining industries](#)
[6616 oil industry](#)
[6621 electrical and nuclear industries](#)
[6626 soft energy](#)

68 INDUSTRY

[6806 industrial structures and policy](#)
[6811 chemistry](#)
[6816 iron, steel and other metal industries](#)
[6821 mechanical engineering](#)
[6826 electronics and electrical engineering](#)
[6831 building and public works](#)
[6836 wood industry](#)
[6841 leather and textile industries](#)
[6846 miscellaneous industries](#)

72 GEOGRAPHY

[7206 Europe and the former Soviet Union](#)
[7211 regions of the Community countries](#)
[7216 America](#)
[7221 Africa](#)
[7226 Asia and Oceania](#)
[7231 economic geography](#)
[7236 political geography](#)
[7241 overseas countries and territories](#)

76 INTERNATIONAL ORGANIZATIONS

[7606 United Nations](#)
[7611 European organizations](#)
[7616 extra-European organizations](#)
[7621 intergovernmental organizations](#)
[7626 non-governmental organizations](#)

Appendix 11 Social protection microthesaurus in EUROVOC

2836 social protection

leave on social grounds

RT paid leave (4416)

NT1 maternity leave

NT1 parental leave

NT1 sick leave

social security

RT redistribution of income (1626)

RT retired person (4406)

RT social well-being (2821)

NT1 additional benefit

NT1 death grant

NT1 disability insurance

RT incapacity for work (4416)

NT1 family benefit

RT family policy (2806)

NT1 health insurance

RT health costs (2841)

NT1 maternity benefit

RT family policy (2806)

NT1 occupational accident insurance

RT occupational accident (4416)

NT1 pension scheme

RT retired person (4406)

RT retirement conditions (4406)

NT2 cumulative pension entitlement

RT overlapping of income (1626)

NT2 supplementary pension

NT2 transfer of pension rights

NT1 social security legislation

RT social court (1226)

NT1 social-security benefit

NT1 social-security contribution

RT deduction at source (4421)

RT wage cost (4026)

NT1 social-security harmonization

RT approximation of laws (1011)

NT1 survivor's benefit

RT widowed person (2806)

NT1 unemployment insurance

RT unemployed person (4411)

RT unemployment (4406)

welfare

RT social policy (2826)

NT1 aid to low-income groups

RT low income (1626)

RT poverty (1626)

RT sub-proletariat (2821)

NT1 care for the elderly

RT elderly person (2816)

RT gerontology (2841)

- NT1 [care of the disabled](#)
 - RT [people with disabilities](#) ([2826](#))
- NT1 [home help](#)
 - RT [elderly person](#) ([2816](#))
 - RT [large family](#) ([2806](#))
- NT1 [mutual assistance scheme](#)
 - RT [social economy](#) ([1621](#))
- NT1 [social assistance](#)
 - RT [guaranteed income](#) ([1606](#))
- NT1 [social facilities](#)
 - RT [community facilities](#) ([2846](#))
 - RT [homelessness](#) ([2826](#))
 - RT [socio-cultural facilities](#) ([2846](#))
- NT1 [social services](#)
 - RT [social worker](#) ([2826](#))
- NT1 [social work](#)
 - RT [social worker](#) ([2826](#))

Appendix 12 The social welfare hierarchy in ELSST

01 -- EDUCATIONAL WELFARE
01 -- EMERGENCY AND PROTECTIVE SERVICES >>
02 ---- AMBULANCE SERVICES >>
02 ---- FIRE-FIGHTING SERVICES
02 ---- POLICE SERVICES >>
03 ----- POLICE STATIONS
02 ---- RESCUE SERVICES >>
03 ----- SEA RESCUE
01 -- HEALTH SERVICES >>
02 ---- AMBULANCE SERVICES >>
02 ---- HOSPITAL SERVICES >>
03 ----- HOSPITAL ADMISSIONS >>
04 ----- HOSPITAL WAITING LISTS
03 ----- HOSPITAL BED PROVISION
02 ---- MATERNITY SERVICES
02 ---- MEDICAL CENTRES
02 ---- PRIVATE HEALTH CARE
02 ---- STATE HEALTH SERVICES
01 -- PUBLIC HOUSING
01 -- SOCIAL SERVICES >>
02 ---- PERSONAL SOCIAL SERVICES >>
03 ----- CARE IN THE COMMUNITY
03 ----- CARE OF THE DISABLED >>
04 ----- RESIDENTIAL CARE OF THE DISABLED >>
03 ----- CARE OF THE ELDERLY >>
04 ----- RESIDENTIAL CARE OF THE ELDERLY >>
03 ----- CARE OF THE SICK >>
04 ----- RESIDENTIAL CARE OF THE SICK >>
03 ----- CHILD WELFARE >>
04 ----- ADOPTION >>
05 ----- ADOPTED CHILDREN
04 ----- CHILDREN IN CARE
04 ----- FOSTER CARE >>
05 ----- FOSTER CHILDREN
04 ----- RESIDENTIAL CHILD CARE >>
03 ----- HOME HELP
03 ----- RESIDENTIAL CARE >>
04 ----- RESIDENTIAL CARE OF THE DISABLED >>
04 ----- RESIDENTIAL CARE OF THE ELDERLY >>
04 ----- RESIDENTIAL CARE OF THE SICK >>
04 ----- RESIDENTIAL CHILD CARE >>
02 ---- SOCIAL SECURITY >>
03 ----- LEGAL AID
03 ----- SOCIAL SECURITY BENEFITS >>
04 ----- CHILD BENEFIT
04 ----- STATE PENSIONS
04 ----- UNEMPLOYMENT BENEFIT
03 ----- SOCIAL SECURITY CONTRIBUTIONS
02 ---- SOCIAL WORK >>
03 ----- COMMUNITY WORK
03 ----- SOCIAL WORKERS >>
04 ----- PROBATION OFFICERS

Appendix 13 The “social framework” hierarchy in EUROVOC

2821 social framework
social analysis
NT1 opinion poll
RT <u>sample survey</u> (1631)
RT <u>voting intentions</u> (0416)
NT1 social indicator
RT <u>economic indicator</u> (1631)
NT1 social survey
RT <u>economic statistics</u> (1631)
RT <u>economic survey</u> (1631)
social situation
NT1 social norm
RT <u>social clause</u> (2021)
NT1 socio-economic conditions
NT2 living conditions
RT <u>cost of living</u> (1611)
RT <u>standard of living</u> (1626)
NT2 quality of life
RT <u>quality of the environment</u> (5206)
RT <u>standard of living</u> (1626)
NT2 social well-being
RT <u>social security</u> (2836)
RT <u>Welfare State</u> (0406)
social structure
RT <u>socio-professional category</u> (4411)
NT1 intellectual
NT1 social class
RT <u>class struggle</u> (2826)
NT2 lower class
NT2 middle class
NT2 peasant class
RT <u>farmers' movement</u> (0431)
RT <u>rural population</u> (2816)
NT2 ruling class
NT2 sub-proletariat
RT <u>aid to low-income groups</u> (2836)
RT <u>poverty</u> (1626)
NT2 upper class
NT2 working class
RT <u>blue-collar worker</u> (4411)
RT <u>workers' movement</u> (0431)
NT1 social inequality
NT1 social mobility
RT <u>job mobility</u> (4411)
NT1 social status
NT1 socially disadvantaged class
RT <u>pauperization</u> (1626)
RT <u>poverty</u> (1626)

socio-cultural group	
	<i>RT</i> <u>cultural difference</u> (2831)
	<i>RT</i> <u>cultural identity</u> (2831)
NT1	ethnic group
	<i>RT</i> <u>ethnic discrimination</u> (1236)
	<i>RT</i> <u>indigenous population</u> (2816)
	NT2 gypsy
	<i>RT</i> <u>nomadism</u> (2811)
NT1	linguistic group
	<i>RT</i> <u>linguistic discrimination</u> (1236)
NT1	religious group
	<i>RT</i> <u>religious discrimination</u> (1236)
	NT2 Jew
	<i>RT</i> <u>Judaism</u> (2831)

Appendix 14 The “social structure” hierarchy in ELSST

Social structure

01 -- FAMILY ROLES >>
02 ---- BREADWINNERS
02 ---- HEADS OF HOUSEHOLD
02 ---- HOMEMAKERS >>
03 ----- HOUSEWIVES
01 -- GENDER ROLE >>
02 ---- WOMEN'S ROLE
01 -- SOCIAL MOBILITY
01 -- SOCIAL STATUS >>
02 ---- OCCUPATIONAL STATUS
02 ---- SOCIO-ECONOMIC STATUS
01 -- SOCIAL STRATIFICATION >>
02 ---- CLASS DIFFERENTIATION
02 ---- ELITE
02 ---- SOCIAL CLASS >>
03 ----- MIDDLE CLASS
03 ----- UPPER CLASS
03 ----- WORKING CLASS
02 ---- SOCIAL INEQUALITY

Appendix 15 Methodology Hierarchy

Proposed methodology hierarchy based on the Thesaurus of Social Research Methodology copyright SRM-Documentation Centre (Rotterdam), 1996.

METHODOLOGY
01 -- RESEARCH METHODOLOGY
02 ---- QUALITATIVE METHODOLOGY
02 ---- QUANTITATIVE METHODOLOGY
01 -- TYPES OF RESEARCH
02 ---- EXPLORATORY RESEARCH
02 ---- DESCRIPTIVE RESEARCH
02 ---- HYPOTHESIS TESTING RESEARCH
02 ---- COMPARATIVE RESEARCH
03 ----- CROSS-SECTIONAL RESEARCH
03 ----- LONGITUDINAL RESEARCH
04 ----- COHORT STUDY
04 ----- PANEL STUDY
04 ----- TIME SERIES
04 ----- TREND STUDY
04 ----- FOLLOW-UP STUDY
04 ----- HISTORIOGRAPHIC RESEARCH
03 ----- CROSS-CULTURAL RESEARCH
02 ---- SURVEY RESEARCH
02 ---- EXPERIMENTAL RESEARCH
02 ---- CASE STUDY
02 ---- FIELD RESEARCH
02 ---- ACTION RESEARCH
02 ---- SECONDARY ANALYSIS
02 ---- META ANALYSIS
02 ---- APPLIED RESEARCH
03 ----- PUBLIC OPINION RESEARCH
03 ----- POLITICAL RESEARCH
03 ----- MARKET RESEARCH
02 ---- CONTENT ANALYSIS
01 -- LEVELS OF ANALYSIS
02 ---- GROUP ANALYSIS
03 ----- AGGREGATIVE ANALYSIS
02 ---- INDIVIDUAL ANALYSIS
02 ---- MULTI-LEVEL ANALYSIS
02 ---- RELATIONAL ANALYSIS
01 -- TYPES OF ANALYSIS
02 ---- UNIVARIATE ANALYSIS
02 ---- MULTIVARIATE ANALYSIS
03 ----- LINEAR MODELS
04 ----- LINEAR REGRESSION ANALYSIS
04 ----- ANALYSIS OF VARIANCE
04 ----- LATENT VARIABLE MODELS
05 ----- FACTOR ANALYSIS
05 ----- CAUSAL MODELS
04 ----- DISCRIMINANT ANALYSIS
04 ----- ANALYSIS OF CHANGE
04 ----- DISCRETE MODELS

METHODOLOGY
03 - - - - - NONLINEAR MODELS
04 - - - - - CLUSTER ANALYSIS
04 - - - - - CORRESPONDENCE ANALYSIS
04 - - - - - CONTRAST GROUPS ANALYSIS
04 - - - - - NONLINEAR REGRESSION ANALYSIS
01 - - STATISTICAL THEORY
02 - - - PROBABILITY THEORY
03 - - - - - PROBABILITY DISTRIBUTIONS
02 - - - - STATISTICAL INFERENCE
03 - - - - - ESTIMATION
03 - - - - - HYPOTHESIS TESTS
03 - - - - - STATISTICAL DECISION THEORY
02 - - - - SUMMARY MEASURES
02 - - - - STATISTICAL TESTS
01 - - DATA COLLECTION
02 - - - QUESTIONNAIRES
03 - - - - - SELF-ADMINISTERED QUESTIONNAIRES
04 - - - - - MAIL SURVEYS
02 - - - - INTERVIEWS (DATA COLLECTION)
03 - - - - - UNSTANDARDISED INTERVIEWS
03 - - - - - STANDARDISED INTERVIEWS
03 - - - - - GROUP INTERVIEWS
03 - - - - - TELEPHONE INTERVIEWS
02 - - - - OBSERVATION
03 - - - - - FIELD OBSERVATION
03 - - - - - LABORATORY OBSERVATION
03 - - - - - PARTICIPANT OBSERVATION
02 - - - - DIARIES
02 - - - - SIMULATION
02 - - - - MEASUREMENTS
02 - - - - TRANSCRIPTION
02 - - - - PROJECTIVE TECHNIQUES
01 - - SAMPLING PROCEDURES
02 - - - - COMPLETE COUNT
02 - - - - PROBABILITY SAMPLE
03 - - - - - SIMPLE RANDOM SAMPLE
03 - - - - - SYSTEMATIC SAMPLE
03 - - - - - STRATIFIED SAMPLE
03 - - - - - CLUSTER SAMPLE
03 - - - - - MULTIPHASE SAMPLE
03 - - - - - TIME SAMPLE
02 - - - - NONPROBABILITY SAMPLE
03 - - - - - PURPOSIVE SAMPLE
04 - - - - - QUOTA SAMPLE
04 - - - - - RANDOM WALK SAMPLE
03 - - - - - ACCIDENTAL SAMPLE
04 - - - - - VOLUNTEER SAMPLE
04 - - - - - CONVENIENCE SAMPLE
01 - - TIME METHODS (RESEARCH)
02 - - - - CROSS-SECTIONAL RESEARCH

METHODOLOGY
02 ---- LONGITUDINAL RESEARCH
03 ----- COHORT STUDY
03 ----- PANEL STUDY
03 ----- TIME SERIES
03 ----- TREND STUDY
03 ----- FOLLOW-UP STUDY
03 ----- HISTORIOGRAPHIC RESEARCH
01 -- DATA SOURCES
02 ---- LOCAL GOVERNMENT RECORDS
02 ---- BUSINESS RECORDS
02 ---- EDUCATIONAL RECORDS
02 ---- ELECTORAL RECORDS
02 ---- EXPORT RECORDS
02 ---- LEGAL RECORDS
02 ---- LOCAL GOVERNMENT RECORDS
02 ---- MEDICAL RECORDS
02 ---- PARLIAMENTARY RECORDS
02 ---- POPULATION RECORDS
03 ----- CENSUS RECORDS
03 ----- BIRTH RECORDS
03 ----- DEATH RECORDS
03 ----- MARRIAGE RECORDS
02 ---- BOOKS
02 ---- OFFICIAL PUBLICATIONS
02 ---- PAMPHLETS
02 ---- AUTOBIOGRAPHIES
02 ---- BIOGRAPHIES
02 ---- CORRESPONDENCE
02 ---- DIARIES
02 ---- DIRECTORIES
03 ----- COMMERCIAL DIRECTORIES
03 ----- COURT DIRECTORIES
03 ----- TELEPHONE DIRECTORIES
03 ----- TRADE DIRECTORIES
02 ---- NEWSPAPERS
02 ---- PERIODICALS
02 ---- REPORTS
02 ---- STANDARDS
01 -- DATA FORMAT
02 ---- TEXTUAL DATA
02 ---- NUMERIC DATA
02 ---- ALPHA/NUMERIC DATA
02 ---- IMAGE DATA
01 -- DATA STRUCTURE
02 ---- RECTANGULAR DATA
02 ---- RELATIONAL DATA
02 ---- HIERARCHICAL DATA

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Glossary of Terms for the LIMBER Project

AHDS	Arts and Humanities Data Service
AHRB	Arts and Humanities Research Board
API	Application Program Interface
ARCES	Archivo de Estudios Sociales (part of CIS)
BT	Broader Term
CEP	Centre for Economic Performance
CESSDA	Council of European Social Science Data Archives
CIS	Centro de Investigaciones Sociológicas, Madrid
CLRC	Central Laboratory of the Research Councils
CONTROLLED VOCABULARY	Controlled vocabulary is a subset of natural language, consisting of preferred and non-preferred terms.
DDI	Data Documentation Initiative
DTD	Document Type Definition
ECASS	The European Centre for Analysis in the Social Sciences
ELSST	European Language Social Science Thesaurus, produced by the LIMBER Project.
FSD	Finnish Social Science Data Archive
HASSET	Humanities and Social Science Electronic Thesaurus
HIERARCHY	Classify according to various criteria into successive levels or layers.
IASSIST	International Association for Social Science Information Service & Technology
ILRT	Institute for Learning and Research Technology
Intrasoft	Software Company (Luxembourg/Greece)
ISER	Institute for Social and Economic Research
LEAD-IN TERM	See UF
LIMBER	Language Independent Metadata Browsing of European Resources
NDAD	UK National Digital Archive of Datasets
NESSTAR	Networked European Social Science Tools and Resources
NKOS	Networked Knowledge Organization Systems/Services
NON-PREFERRED TERM	See UF
NSD	Norwegian Social Science Data Services
NT	Narrower Term
PREFERRED TERM	The designated word or phrase (index term/ keyword) that describes a concept in the thesaurus.
PRO	Public Records Office
RAL	Rutherford Appleton Laboratory
RDF	Resource Description Framework
RT	Related Term
SDA	Swedish Data Archive (also SSD)
SIDOS	Swiss Information and Data Archive Service for the Social Sciences

SN	Scope Note. These provide historical or linguistic clarification or define a term more precisely in cases of ambiguity.
SOSIG	Social Science Information Gateway
SSD	Swedish Data Archive (also SDA)
SSTD	Space Science and Technology Department
SYNONYM	A word or phrase which has the same or nearly the same meaning as another word or phrase in the same language.
TMS	Thesaurus Management System
TT	Top Term
UF	Use For; non-preferred synonyms or near-synonyms of the preferred term which act as lead-in terms.
UKDA	United Kingdom Data Archive
UNESCO	United Nations Educational, Scientific and Cultural Organisation
XML	eXtensible Mark-up Language
YSA	Yleinen suomalainen asiasanasto - Finnish controlled vocabulary
ZA	Zentralarchiv für Empirische Sozialforschung Central Archive for Empirical Social Research, University Cologne