EASTIN-CL

**Crosslingual and multimodal search
in a Portal for Support of Assisted Living
Project no. 250432**

EASTIN-CL Annual Report 2011

Deliverable D8.12

Version: November 2011

Date: 2011-11-30

EASTIN-CL
2nd Annual Report 2011

Project Ref. no.:   250432
Acronym: **EASTIN-CL**
Reporting period: **December 2010 to November 2011**
Project coordinator:

Name: Gregor Thurmair
Organisation: Linguatec GmbH
Phone   +49 89 896664 0
Fax: +49 89 88 91 99 33
Email: g.thurmair@linguatec.de

Content

1. Introduction and Project Objective

Relevance

Participation and full citizenship, also called **e-Inclusion**, is one of the prominent goals of the European community. This includes the full participation of people with disabilities to social life.

In a 2003 study, the European Commission states that „assistive technologies play an increasingly central role in equalising opportunities for people with disabilities in all aspects of life". This statement must be seen in the context that the number of people with disabilities, in an ageing society, will increase from now 11% to 17% in 2020, so the problem will aggravate in the future.

However, access to information about assistive products and technology is still restricted, with language being a significant barrier in the information flow.

Being able to understand foreign language documents, and being able to freely select the communication channel to access such information, as offered by EASTIN-CL, will foster the principles of e-Inclusion.

Objective

The project will support the social participation of disabled and elderly people, by providing crosslingual and multimodal support for accessing information bases on assistive tools and technology.

Recent efforts have linked national assistive technology information bases into a European portal called EASTIN (www.eastin.eu). The objective of EASTIN-CL is to enhance this portal by creating a front-end to make it more accessible, using language technology:
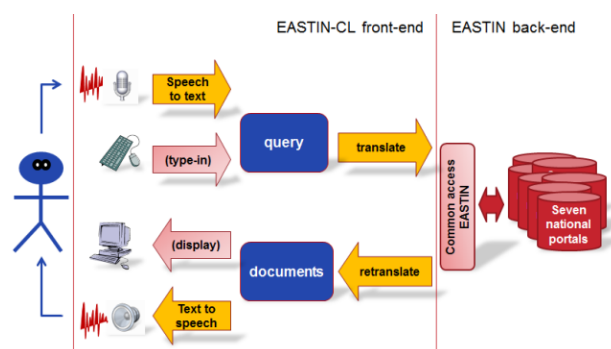
- **Multilingual** technology will allow users to search the data in their native language;
- **Multimodal** technology will allow them to access the portal not just in written but also in spoken communication.

Target users currently are mainly professionals, like doctors, physiotherapists, insurances, or manufacturers. EASTIN-CL helps to open the information bases on assistive technologies also for end users (e.g. ageing people).

Main tasks

EASTIN-CL supports access to information bases on assistive domain along three action lines:

- providing easy and **intuitive access** also for end users, by supporting query formulation;
- offering **language-transparent** access, by allowing users to access foreign-language documents in their native language, and have the search results retranslated into their native language;
- adding a **speech** communication channel, by accepting spoken queries, and by converting search results into spoken language, making communication more barrier-free.

The languages supported by at least one of the EASTIN-CL tools are: Danish, English, Estonian, German, Italian, Latvian, and Lithuanian. Other languages can be added as well.

A by-product, a multilingual terminological glossary of the assistive domain has been created, covering all relevant search terms and their translations. This glossary is available for online access.

Partners:

The EASTIN-CL consortium consists of two profiles of project partners:

On the technology development site, partners are:

- **Linguatec GmbH** (Germany), providing speech technology and translation for German, English, and Italian
- **Tilde SIA** (Latvia), providing speech and translation support for the Baltic languages

On the side of domain expertise, partners are:

- **Institut der deutschen Wirtschaft Köln / Rehadat** (Germany), provider of the largest information base on assistive technology in the German speaking countries

- **Fondazione Don Carlo Gnocchi Onlus / SIVA** (Italy), responsible of the Italian web portal on Assistive Technology, coordinator of the European Assistive Technology Information Network (EASTIN), and host of the EASTIN portal

- **The Danish Centre for Assistive Technology (Hjælpemiddelinstituttet)**, responsible for AssistData, the Danish database on assistive technology, and founding partner of the European Assistive Technology Information Network (EASTIN).

2. Project Progress

2.1 Scientific and technical progress

The second phase of the project was focused on the implementation of the EASTIN-CL components and resources, and their integration into the revised EASTIN portal software.
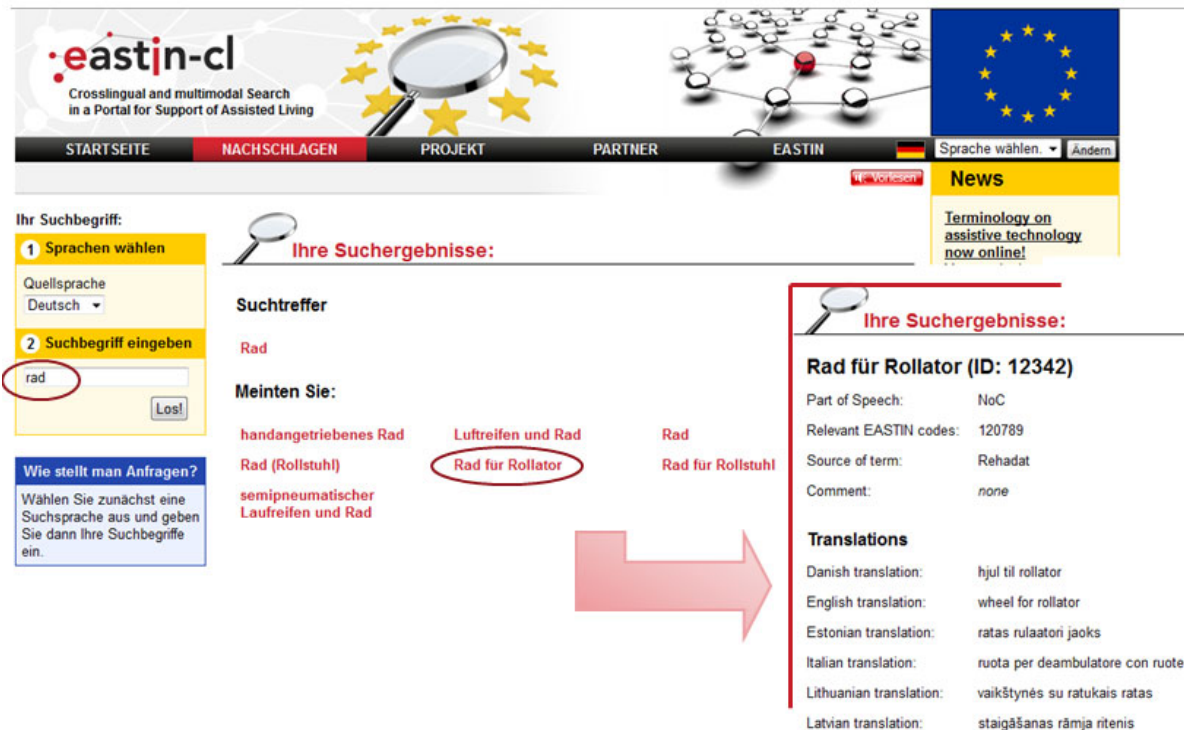
2.1.1 Terminology of the Assistive Domain

A common multilingual terminology is vital for creating language technology for a given domain. EASTIN-CL collected the domain terminology in two steps:

First, a master list consisting of English terms and links to ISO codes representing product groups was created. The terms were taken from index lists of the databases of the partners, as well as from the ISO 9999 index terms, which describe the assistive domain in a three-layer classification. After some clean-up and merging, about 12.700 terms were left; they were completed by adding ISO codes (one or more) for the best-matching product group. This list formed the backbone of the domain terminology.

In a second step, the master list was translated into each EASTIN-CL language by the project and domain partners. This resulted in terminology in 7 languages (Danish, German, English, Estonian, Italian, Lithuanian, Latvian), with about 85.000 individual terms.

This list was completed as a deliverable in February 2011, and was made available for public lookup on the EASTIN-CL website (cf. fig. 2-1).

Fig. 2-1 Online term lookup (www.eastin-cl.eu)

After the completion of the term list, a second version was created, due to the fact that ISO issued a new release of the ISO9999 classification, containing changes in both ISO codes and index terms. These changes led to an update of the term list.

The terminology of the Assistive domain is the basis for the adaptation work of all language technology components in the project, to form a cognitive coherence between the different tools.

2.1.2 The EASTIN portal software

In order to be able to link the language technology components, the EASTIN portal software needed to be adapted, both in the internal structure and in the User Interface design.

Portal Implementation

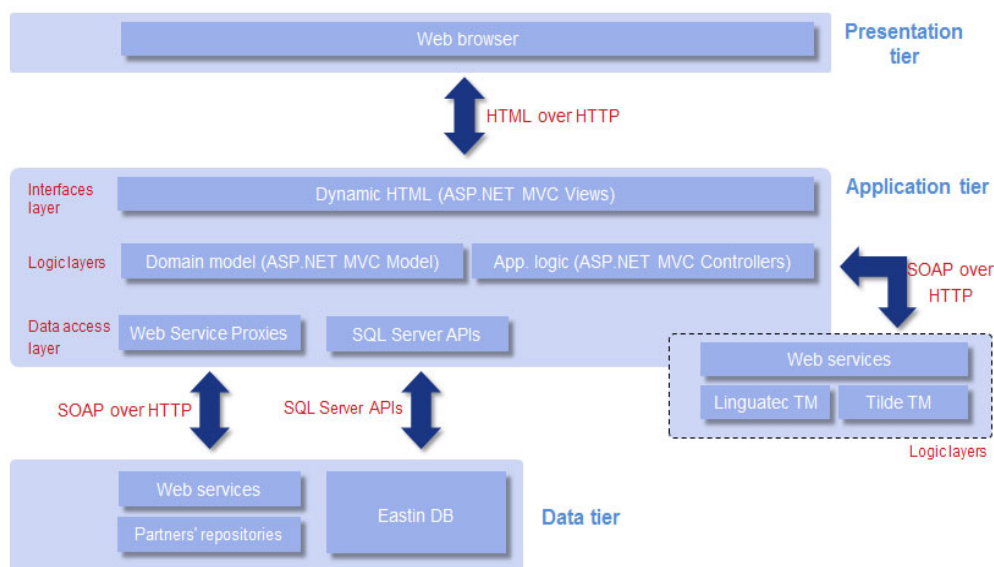The new architecture is shown in fig. 2-2.

Fig. 2-2: Portal architecture

Apart from upgrades of underlying software components, the main progress was to separate the different layers of the portal application (presentation business logic, and data access) such enabling the software to access other web services, like the language processing ones, in a consistent way in the application logic.

The portal implementation was finished and tested in September 2011, and served as a platform for integration from then onwards.

User Interface

The portal also came with a complete new design of the user interface, as shown in fig. 2.3.

While both versions are multilingual and fully accessible, the new version is more ergonomic, contains tabs for the main information items, and contains a field for free text search as well as a button for speech output, to link the EASTIN-CL components. The description fields will be machine-translated on request.

The interface was reviewed by experts both from ergonomics and from domain; it may be subject for review as result of the user tests.
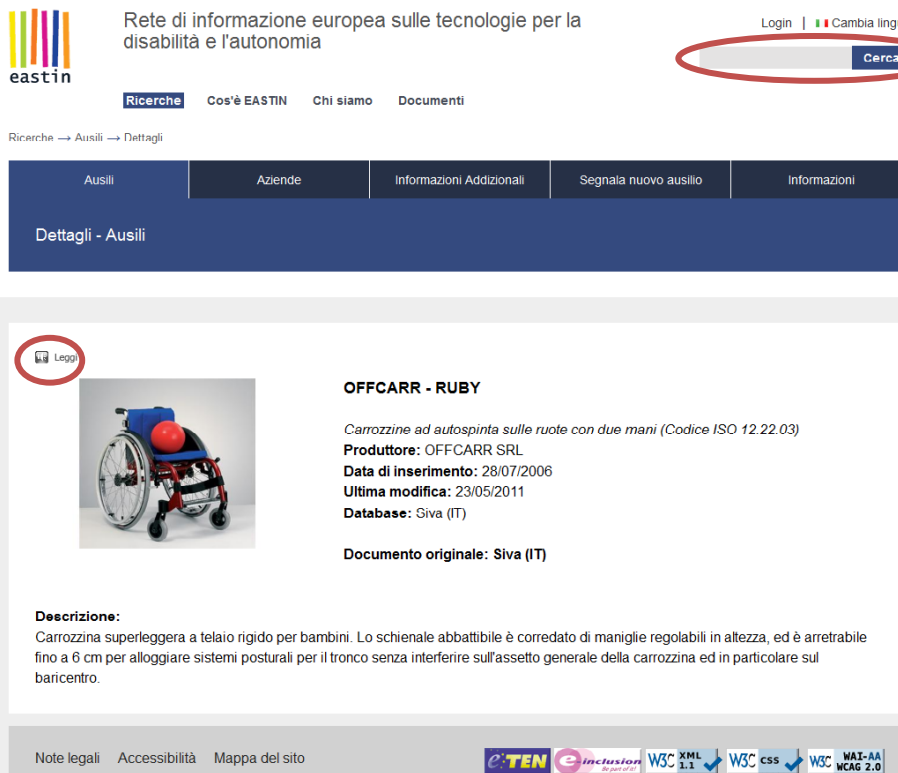
Fig. 2-3: New Eastin Portal: Layout

2.1.3 The EASTIN language technology components

All EASTIN technology components were implemented and component-tested during in the second and third quarter of 2011. The different language technology components of the system, implemented as web services, are shown in fig. 2-4. They use SOAP communication, and communicate via APIs tailored for the respective component.

Query Processing

Query processing must map the user text input to the best-matching product group, represented by ISO codes. The component works for all the EASTIN-CL languages; its main challenge is to reduce the variance which the natural language allows, and find the best (set of) query terms from the term list.
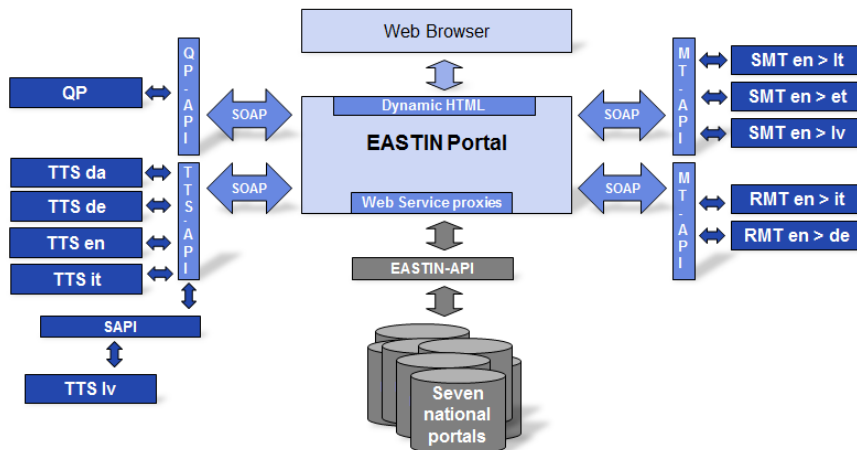

Fig. 2-4: EASTIN-CL: Language Technology Components

The main resource is the term list is each language; however the component needs access to lexicons, to normalisation (e.g. to cope with spelling variants and spelling errors) and other procedures, and finally it applies a ranking to find the best matching term(s) of the term list. It is designed to increase recall, as it is frustrating for users to have 0 results for a search.

Machine Translation

When users have found relevant products they can translate the product descriptions into their native language. EASTIN-CL offers translations from English into German, Estonian, Italian, Lithuanian, and Latvian. The MT systems were adapted to the Assistive domain, by adding domain specific terminology to the MT system resources, and by tuning the systems to optimally use this additional information.

Speech Synthesis

To add an additional communication channel, the portal offers text-to-speech options. By clicking on the 'read' button in the page, users can listen to the system which reads out the text of the page by means of a little mp3 player popping up.

Fig. 2-5: Activation of the TTS component by the users

Text-to-Speech components were integrated for Danish, German, English, Italian, and Latvian. The components were also adapted to the domain, by listening to the pronunciation of the domain-relevant vocabulary, and correcting it in case of mis-pronunciations.

Speech Recognition

To complete the option to have a full spoken interaction, a speech recognition component was implemented for German, in the Rehadat portal. It allows users to fully navigate in the Rehadat webpage with spoken commands. Special macros were written for easier navigation, and the domain specific vocabulary was loaded and tested for recognition errors.

This component was successfully demonstrated at the REHACARE workshop (cf. below).

2.1.4 Integration and test

The integration of the language technology components started in September, and a first version could be demonstrated on a project meeting in November. Integration is on-going as minor inconsistencies need to be addressed.

For users, integration means to have a type-in window for natural language queries, and a button to read the page; this is shown in fig. 2-4 above.

Tests have started in September, beginning with the speech recognition component and navigation on the Rehadat web site. Component tests were made to ensure the proper functioning of the single components. Functional and field tests will be performed by domain experts and end users, accessing a special version of the portal, and filling in online questionnaires.

Testing, and version polishing, will be the focus of work in the remaining project period.

2.2 Communication, dissemination and awareness activities

The project was presented at several workshops and conferences.

2.2.1 Dissemination Activities

The EASTIN-CL project was presented at the 11th European conference of the AAATE (Association for the Advancement of Assistive Technology in Europe) held in Maastricht from August 31st to September 2nd (http://www.aaate2011.eu/).

The project and new interface concept was also presented within the annual assembly of the Italian association of Assistive Technology Assessment Centres (the GLIC association www.centriausili.it), held in September 2011 in Milan.

The project, and especially the technical integration of the new components in the EASTIN website, was presented at the meeting of the *XeDotNet* community, an Italian Microsoft .NET Community led by a group of *Microsoft Most Valuable Professionals*, aimed at disseminating the best practices of software development using the Microsoft.NET Framework.

In Denmark 3 workshops including a presentation of EASTIN and the expected results from the EASTIN-CL project where held during August and September. The workshops were attended by 92 AT professionals from 27 different municipalities.

REHADAT did send out a REHADAT-newsletter in March and a press release in May 2011. Furthermore the project was presented in several German events: 20. Rehabilitations-wissenschaftliches Kolloquium in Bochum (Conference, March 2011), Werkstätten-Messe 2011 in Nürnberg (Fair, March 2011), Rehab 2011 in Karlsruhe (Fair, May 2011) and Consozial 2011 in Nürnberg (Fair, November 2011). Once a month EASTIN-CL was also presented in the REHADAT seminars in Cologne.

At "HITmessen – The Assistive Technology Fair" held in Nyborg the 20-21st of September the Danish Database on Assistive Technology, the EASTIN website and the EASTIN-CL initiatives where presented at 3 seminars for about 100 students and from a booth during the fair.

Tilde SIA addressed the representatives of industries related to AT in the Baltic States – both by inviting them to attend EASTIN-CL workshop in REHACARE fair and by introducing them to the EASTIN-CL project status and results achieved. Among them were:

- The Society for the Physically Disabled of Lithuania;
- Council for the affairs of disabled at the ministry of social security and labour in Lithuania;
- Technical assistance center for disabled people at the ministry of social security and labour in Lithuania;
- Lithuanian Medical Library;
- Rehabilitation, Physical and Sports Medicine Center of Lithuania;
- LITHUANIAN STANDARDS BOARD (LST) under the Ministry of Environment of the Republic of Lithuania;

- Estonian Physiotherapists Association
- "Adeli" rehabilitation centre Ltd (Estonia)
- Technical Aids Centre for Disable Person "Invaabikeskus" (www.invaru.ee) (Estonia)
- Equipment sales for disabled persons "ITAK" LLC (www.itak.ee) (Estonia)
- "Health Aid" Ltd (www.terviseabi.ee) (Estonia)
- Estonian Union of Disabled People Movement (www.elil.ee)
- Estonian Chamber of Disabled People
- Tallinn Central Hospital (www.itk.ee) (Estonia)
- Tallinn Social and Health Care (Estonia)
- Estonian Rehabilitation centre "ASTANGU"
- Estonian Ministry of Social Affairs (www.sm.ee)
- Assistant Director, SIVA – Social Integration State Agency (Latvia)
- Director of Center of Technical Remedies of NRC "Vaivari" (www.nrcvaivari.lv) (Latvia)
- APEIRONS, GNO to provide help to handicapped with motion limitations (www.apeirons.lv) (Latvia)
- SUSTENTO, Latvian Umbrella Body for Disability organizations (www.sustento.lv)
- ErgoTherapeits Association (www.ergoterapija.lv) (Latvia)
- Ministry of Welfare Department of Equal Opportunities (www.lm.gov.lv) (Latvia)
- Head of Department, Ministry of Welfare, Department of Social Services (www.lm.gov.lv) (Latvia)
- Equipments for Disabled people "HEMAT Ltd" (www.hemat.lv) (Latvia)
- Equipments for Disabled people "DINASTIJA Ltd" (www.dynasty.lv) (Latvia)

2.2.2 REHACARE

Rehacare International Fair in Düsseldorf, September 2011, is the most important trade fair for

rehabilitation, prevention, integration and care, and the largest fair for assistive products worldwide. EASTIN-CL decided to make it the main focus of dissemination for the project. Therefore, a booth was organised to present the EASTIN portal and the EASTIN-CL front-end components, and also a workshop was held where the technology was presented in a broader context to a special audience.

An update of the dissemination material was produced for this occasion:

- a banner was made for the booth
- updated flyers were created (in German) for this event, for this particular target user group

The title of the workshop was "Sharing Information on Assistive Devices in Europe – Breaking the barriers" and demonstrated how to access information on assistive technologies in an European context. The workshop consisted of several talks and an open discussion; it attracted more visitors than expected. First Mr R. Andrich (former president of AAATE) gave an introduction on the importance of assistive technology for people with disabilities; then, V. Gower (Fondazione Don Gnocchi) presented the activities of the EASTIN association to provide access to assistive technology, and the EASTIN portal as key entry

point; after that, EASTIN-CL project results were presented: P. Winkelmann (IWKöln) showed how navigation on the Rehadat website using speech recognition was possible, and Gr. Thurmair (Linguatec) explained the processing of natural language queries, and the Assistive terminology. The final discussion focused mainly on accessibility issues, and product comparison and evaluation in the portals.

2.2.3 Planned Activities

Apart from conference and workshop presentations, two main dissemination activities as envisaged:

- a press release, and press campaign, when the EASTIN portal will be re-launched with all language technology components in it. This will be in Q1 / 2012
- a presentation of the complete package at the ICCHP conference (13th. Int. Conference on Computers Helping People with Special Needs, Linz, July 2012). This is the main conference in the domain. As the complete EASTIN-CL software was not available yet, only components could be presented at REHACARE. It is planned to have a demonstration of the full portal at the ICCHP conference.

In addition, presentations at conferences and workshops will be given.

2.3 User and market related aspects

Previous activities of the project have led to the foundation of centres of Assistive technology in some of the Baltic countries. As they have no product databases on their own (yet), users will find support in the EASTIN portal with the language extensions for the Baltic languages.

Tests of the portal will focus on usability of the portal not just for experts but also for end users; the project hopes to improve both the access (in terms of site visits) and the usability (in terms of found products) as a result of its test phase.

The new EASTIN portal has already a significant increase in site visits; this tendency will continue once all new technology components are integrated and tested.

4. Future Work

The main work in the remaining period (the project will end in May 2012) will be to make the portal intuitive and easy to use. This implies the following steps:

- Stabilisation of the different component and their integration. User tests will show where improvements are needed and possible.
- Improvements in user interaction and user experience, again based on the user tests.
- Extended tests on functionality and usability of the portal
- Increased visibility for internet users
- Improved version of the terminology system, and better coverage of user terms if necessary.

If all these factors lead to an increase in visits of the portal then the project would consider this as a success measure.

5. Contact

Web Site

There is the EASTIN-CL website (www.eastin-cl.eu) providing public information on the project; it will offer a term lookup facility as soon as the terminology is available.

Context and Contact

EASTIN-CL is part of the Competitiveness and Innovation Framework Programme of the European Union, in the ICT Policy Support Programme (ICT-PSP),
Theme 5: Multilingual Web Content Management

Project Number: CIP-ICT-PSP-2009-5-3-250432.

Project Duration: 27 months, starting March 1st, 2010

Project Website: www.eastin-cl.eu

Contact: EASTIN-CL: Gr. Thurmair, Linguatec GmbH,
                email: g.thurmair@linguatec.de

                EASTIN Association: R. Andrich, Fondazione Don Carlo Gnocchi Onlus / SIVA
                email: renzo.andrich@siva.it