EESTI KEELE KEELETEHNOLOOGILINE TUGI
NATIONAL PROGRAMME FOR ESTONIAN LANGUAGE TECHNOLOGY

National Programme for Estonian Language Technology: a Pre-final Summary

Einar Meister, Jaak Vilo* & Neeme Kahusk*****

Vice-chairman, *Chairman & * Coordinator of the Programme

Outline

HLT evolution in Estonia

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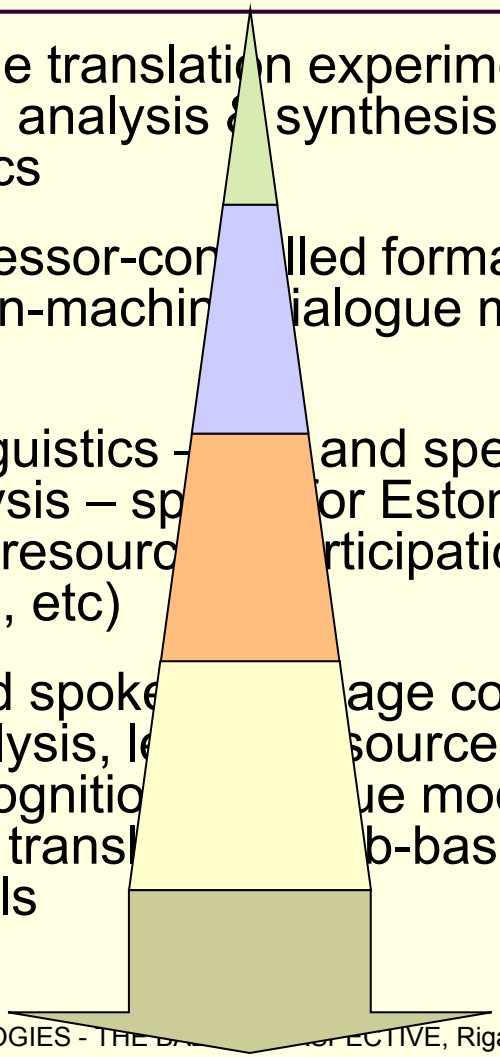
Summary

HLT evolution in Estonia

- **1960-70s:** machine translation experiments, experimental phonetics, speech analysis & synthesis, semantic analysis, computer linguistics
- **1980s:** microprocessor-controlled formant synthesis, speech recognition, human-machine dialogue modelling, electronic dictionaries
- **1990s:** corpus linguistics – text and speech corpora, morphologic analysis – spell-checker for Estonian, electronic dictionaries, Web-resources, participation in EU-projects (WordNet, BABEL, etc)
- **2000s:** written and spoken language corpora, morpho-syntactic and semantic analysis, lexical resources and tools, speech synthesis and recognition, dialogue models, information retrieval, machine translation, web-based access to different resources and tools



HLT evolution in Estonia

Coordinated actions:

- **Estonian HLT program** supported by the Estonian Informatics Centre (1997-2000)
- **EU FP5 project eVikings II** (2002-2005): Roadmap for Estonian HLT 2004-2011
- **Centre of Excellence in HLT** (2003): successful in first round, failed in final round
- **Estonian Language Technology Development Centre** (2005): accepted for financing, but failed due to the withdrawal of the main industrial partner
- **National programme "Estonian Language and Cultural Heritage"** (1999-2003): some HLT-projects funded
- **National programme "Estonian Language and National Memory"** (2004-2008): sub-programme for Estonian HLT (2004-2005)
- **Development Strategy of the Estonian Language 2004-2010**
- **National Programme for Estonian Language Technology (2006-2010)**

National Programme for Estonian Language Technology 2006-2010

Government supported funding initiative aimed at developing of Estonian language resources and language-specific software in order to enable Estonian to function in the modern information technology environment

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Estonian Ministry of Education and Research

Management (1)

- **Steering committee** of 9 members including representatives of the ministries and HLT-experts responsible for:
  - evaluation of project proposals and progress reports
  - making funding proposals
  - purposeful use of public funding
  - surveying the developments in the HLT field on the national and international scale

Management (2)

- **Programme coordinator** responsible for:
  - preparing calls for projects
  - project contracts and reports
  - communication between the ministry, steering committee and project leaders
  - documentation and Web-site administration

Management (3)

- **General rules:**
  - financing of projects based on open competition
  - evaluation of projects based on well-established criteria
  - international standards/formats need to be followed
  - groups are requested to provide annual progress reports
  - developed prototypes and language resources are public

Management (4)

- **Project evaluation criteria:**
  - for new applications:
    - relevance of the proposal in the context of the programme
    - methods applied to achieve the goals of the project
    - competence and experience of the project team
    - usefulness of project's results for other projects
    - compatibility and use of standards
    - etc.
  - for assessment of the annual progress of on-going projects

Funding (1)

- **Funding decision is based on the average score of individual ratings given by the steering committee members**

Average score	Coefficient
90-100%	0,8-1
65-90%	0,7-0,9
< 65%	0

Depending on available funding and number of applications

- Ca 33% for corpus projects, 65% for software & research projects, 1-2% for management

Statistics: projects & funding

	2006	2007	2008	2009	2010
Number of project applications	**22**	**22** (18+4)	**23** (20+3)	**24** (15+9)	**24** (22+2)
Number of funded projects	**18**	**20** (18+2)	**23** (20+3)	**23** (15+8)	**24** (22+2)
Total funding, MEEK (MEUR)	**7.3** (0.47)	**7.1** (0.46)	**13.4** (0.86)	**12.9** (0.83)	**11.8** (0.75)

Projects
http://www.keeletehnoloogia.ee/projects

- **Speech corpora** – emotional speech, spontaneous speech, dialogues, L2 speech, radio news and talk shows

- **Text corpora** – written language corpus, multi-lingual parallel corpora, resources for interactive language learning

- **Research/technology development** – speech recognition & synthesis, machine translation, information retrieval, lexicographic tools, syntactic & semantic analysis, dialogue modeling, rule-based language software, intelligent search engine, variations in speech production and perception

Key players (1)

- **University of Tartu:**
  - morphology, syntax, semantics, and machine translation
  - corpora of written and spoken language, dialogue corpora, parallel corpora, lexical and semantic database (thesaurus, Estonian WordNet), phonetic corpus of spontaneous speech
  - rule-based language software, information retrieval, interactive Web-based language learning

Key players (2)

- **Institute of the Estonian Language:**
  - Corpus-based speech synthesis for Estonian
  - Estonian Emotional Speech Corpus
  - Lexicographer's workbench

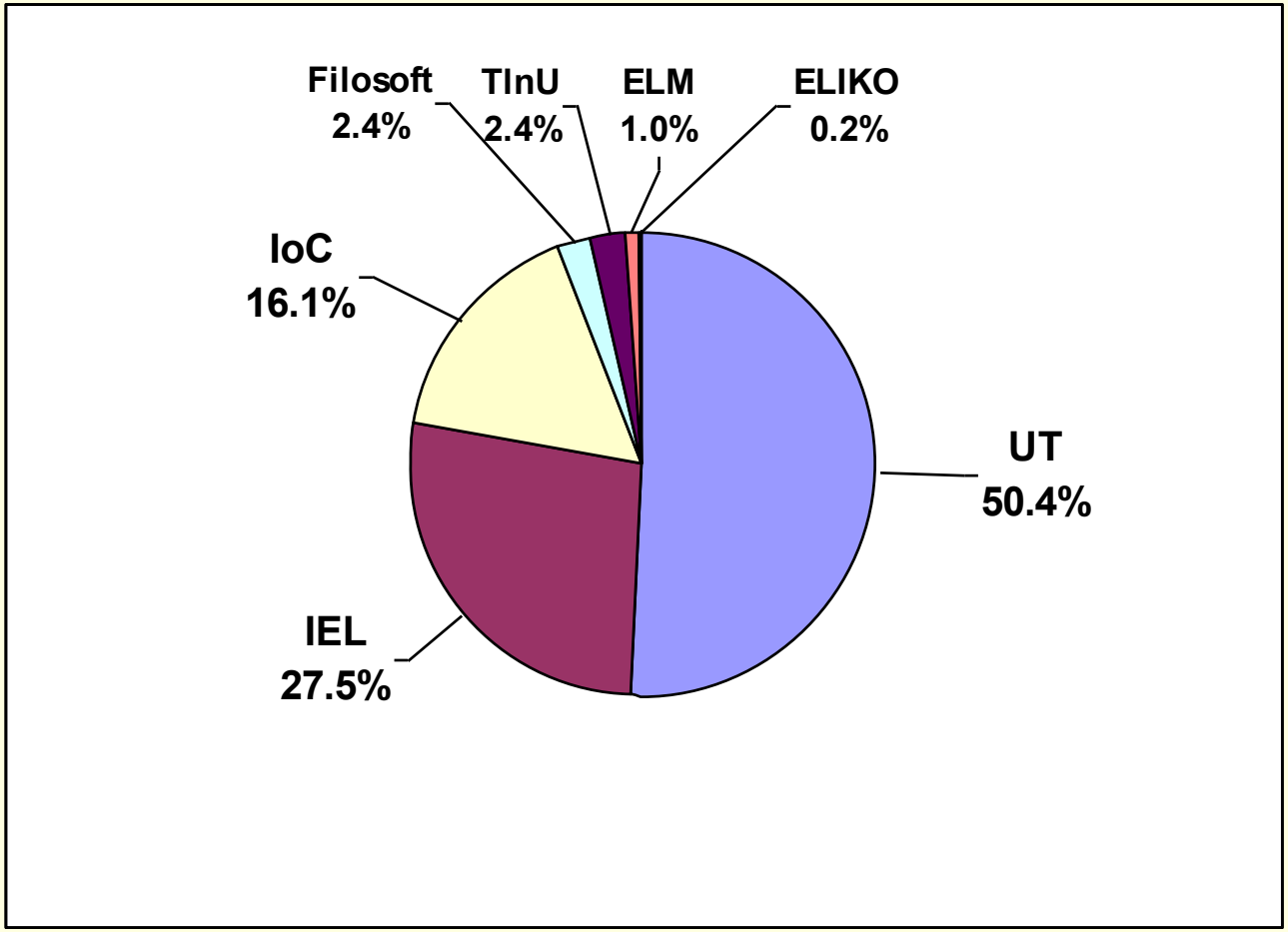
Key players (3)

- **Institute of Cybernetics at Tallinn University of Technology:**
  - automatic speech recognition in Estonian
  - variability in speech production and perception
  - speech corpora including radio news and talk shows, lecture speech, foreign-accented speech

Key players (4)

- **Filosoft:** corpus query in the Estonian language website keeleveeb.ee
- **Tallinn University:** Estonian Interlanguage Corpus
- **Estonian Literary Museum:** electronic dictionary of idiomatic expressions
- **ELIKO:** a prototype of Controlled Natural Language module for knowledge-based systems

Division of funding 2006-2010



Distribution of results (1)

- **Centre of Estonian Language Resources:**
  - the project launched in 2008 at the University of Tartu
  - partners – Institute of the Estonian Language and Institute of Cybernetics at TUT
  - main goal – to develop the infrastructure for archiving, documenting and distribution of Estonian language resources and software tools
  - cooperation with CLARIN project
  - in 2010 included into the Estonian Research Infrastructures Roadmap

Distribution of results (2)

- **Programme conferences:**
  - 1st conference: November 2007, Tallinn
  - 2nd conference: April 2009, Tartu
  - **3rd conference: November 25-26, 2010, Tartu**

Supporting activities

- **Development of human resources:**
  - Doctoral School of Linguistics and Language Technology (2005-2008)
  - Doctoral School in Information and Communication Technologies (2009-2015)
  - Centre of Excellence in Computer Science (2008-2015)
  - Curricula on computer linguistics and language technology at the University of Tartu
  - Speech technology course at Tallinn University of Technology

Future prospects

- **Currently under development:**
  - Estonian BLARK
  - Estonian HLT Roadmap for 2011-2017
  - follow-up programme for 2011-2017
- Focus of the follow-up programme on resources, software tools and **integrated prototypes for public applications**
- **Important issues:**
  - availability of resources and tools via Centre of Estonian Language Resources
  - promoting HLT integration into public and commercial applications
  - urgent need for HLT-engineers and researchers

Summary

- The national programme has created favourable conditions for HLT development in Estonia
- < 50 MEEK (3.5 MEUR) invested into HLT area, < 30 different projects funded
- Remarkable progress in the amount and diversity of Estonian language resources and tools
- Good bases for future applications and international cooperation
- Estonian HLT will be not ready by the end of 2010 – a follow-up programme is necessary

Last, but not least…

Steven Krauwer's talk at the 2nd Baltic HLT conference in Tallinn 2005:

"How to survive in a multilingual EU?“

- *Do not expect too much from the EU due to the* subsidiarity principle
- *National level activities are important – if you don’t care of your language no one will do!*
- *There are at least two areas which should be evolved mainly at the national level – creation of language resources and training of languages technologists*

Really final…

Are we moving fast enough?

Interspeech 2010:

- *Real time speech-to-speech translation*
- *Google voice browser*, etc