BRIDGING TECHNOLOGICAL GAP BETWEEN SMALLER AND LARGER LANGUAGES

Andrejs Vasiļjevs

Tilde

Pisa Workshop on Multilingual Web

05.04.2011

LANGUAGE DIVERSITY SHOULD BE NURTURED AND TOOLS PROVIDED TO BRIDGE LANGUAGE BARRIERS

UNESCO ON LANGUAGE DIVERSITY IN CYBERSPACE

- Information should be made available, accessible and affordable across **all linguistic** [..] groups [..] including people who speak **minority languages**. ICTs shall serve to reduce digital divide and deploy **technology and applications to ensure inclusion**.

- Creation, preservation and processing of, and access to [..] content in digital form should [..] ensure that all cultures can express themselves and have access to Internet **in all languages**, including indigenous and **minority languages**.

//Code of Ethics for the Information Society (Draft)

ALVIN TOFFLER ON THE FUTURE OF SMALLER LANGUAGES

- Survival of smaller languages depends on the outcome of the race between development of Machine Translation and proliferation of larger languages

ABOUT TILDE

- Tilde – Language technology and localization company
- Offices in Riga (Latvia), Vilnius (Lithuania), Tallinn (Estonia)
- 115 employees, including 3 PhDs and 6 PhD candidates/students in Research department
- Expertise in translation technologies, terminology management and in languages of the Baltic countries

MACHINE TRANSLATION AT TILDE

- Rule based MT in development since 1998
- Very time and resource consuming manual work of software experts and linguists
- No national or EU funding was available
- Tilde's English-Latvian and Latvian-Russian RBMT released in 2007
- First on the market but reasonable quality only for simpler texts
- Switching to data-driven statistical methods in 2008
- Heavy participation in EU R&D to foster MT development

Tilde Translator

Beta version

LV EN

Translation direction: English-Latvian

Translate

Clear

Translation finished

This is the second of four workshops that survey and share information about currently available best practices and standards that can help content creators and localizers address the needs of the multilingual Web, including the Semantic Web. They also provide an important opportunity to identify gaps that need to be addressed. The workshop is also designed as an opportunity for participants to network and share information between and across the various different communities involved in enabling the multilingual Web.

Šis ir otrais no četriem semināriem šī izpēte un koplietot informāciju par pašreiz pieejamajiem labākajiem paraugiem un standartiem, kas var palīdzēt satura veidotājiem un lokalizētājiem daudzvalodu tīmekļa vajadzību risināšanai, tai skaitā semantiskā web. Tās nodrošina svarīgu iespēju noteikt trūkumus, kas ir jārisina. Seminārs ir paredzēta arī kā iespēju un tīkla dalībniekiem, lai apmainītos ar informāciju starp dažādām kopienām un dažādiem, iespējojot daudzvalodu web.

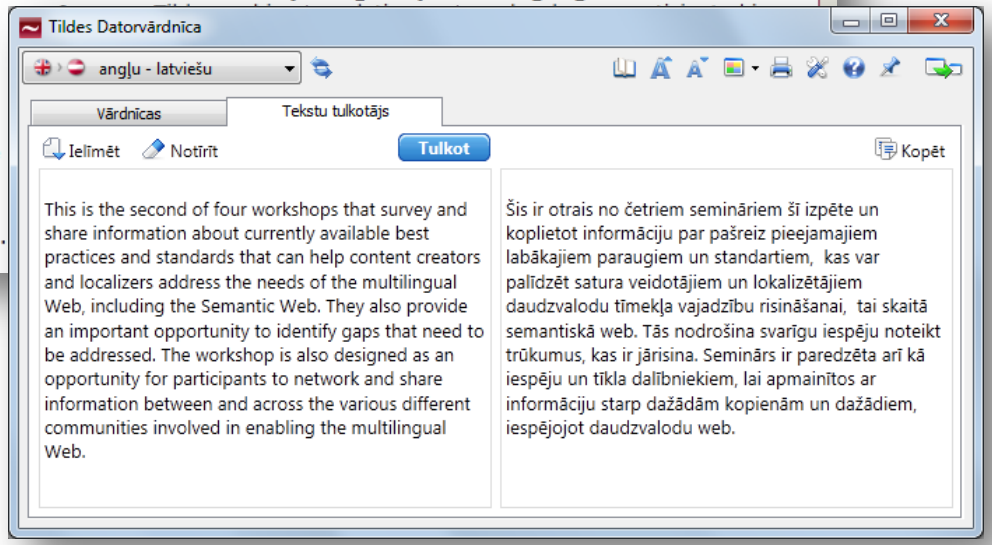
About Tilde Translator

Tilde Translator is a machine translation tool developed by Tilde. The Beta version provides translation from English to Latvian and from Latvian to English. We are working on providing translations in other language combinations too.

Please note that even the best machine translation cannot be compared to text that has been translated by a human being. Often the content and grammar of texts translated by machine is inaccurate and can contain errors. Yet we hope that Tilde Translator will be useful for you and that it will be a good way to grasp the idea of texts and to break down language barriers.

Machine Translation Blog

Tilde Translator Presented at Research Workshop: Machine Translation and Morphologically-rich Languages. In the end of



Microsoft®
Translator | Partneri

Partnerības ir tīmekļa pakalpojuma Microsoft Translator galvenais aspekts. Microsoft Translator mašīntulkojuma pamattehnoloģija tika veidota, pamatojoties uz vairāk nekā desmit gadu gaitā veiktiem pētījumiem Microsoft Research centrā, un mēs uzskatām, ka, lai nodrošinātu pasaules klases tulkošanas pieredzes, ir jāsadarbojas ar lieliskiem vietējiem partneriem, kuri strādā ar savu konkrēto valodu. Šī sadarbība ir bijusi vērtīga miljoniem mūsu lietotāju, sniedzot tulkojumu kvalitāti un tulkotā materiāla pareizu atspoguļojumu.

"Strādājot pie pakalpojuma Microsoft Translator latviešu-angļu un angļu-latviešu programmas uzlabojumiem, Microsoft Research sadarbojās ar uzņēmumu Tilde. Tilde sniedza ieteikumus par vairākām tehnoloģijām, kas bija saistītas ar mašīntulkojumu, datiem un specifiskiem latviešu valodai raksturīgiem rīkiem un tehnoloģijām, tādējādi ievērojami uzlabojot latviešu valodas tulkojumus pakalpojumā Microsoft Translator."

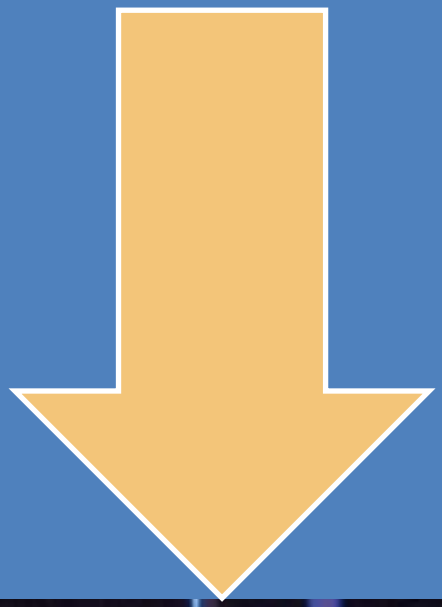
TILDE

Tilde

Sabiedrība Tilde tika dibināta 1991. gadā, un tas ir vadošais Baltijas IT uzņēmums ar specializāciju lokalizācijā, vairākvalodu un interneta programmatūrā, kā arī inovāciju līderis starp Baltijas valstu valodām moderno tehnoloģiju jomā. Sabiedrības Tilde mērķis ir Baltijas valstu valodām, īpaši latviešu, lietuviešu un igauņu, nodrošināt valodas tehnoloģijas, kuras būtu līdzvērtīgas pasaules izplatītāko valodu atbalstam. Tilde ir privāts uzņēmumus ar biroji em Rīgā, Tallinā un Viļņā.

CHALLENGE OF DATA DRIVEN MT

- Rapid development of data driven methods for MT
- Automated acquisition of linguistic knowledge extracted from parallel corpora replace time- and resource-consuming manual work



- Applicability of current data-driven methods directly depends on the availability of very large quantities of parallel corpus data
- Translation quality of current data-driven MT systems is low for under-resourced languages and domains

DATA CHALLENGE

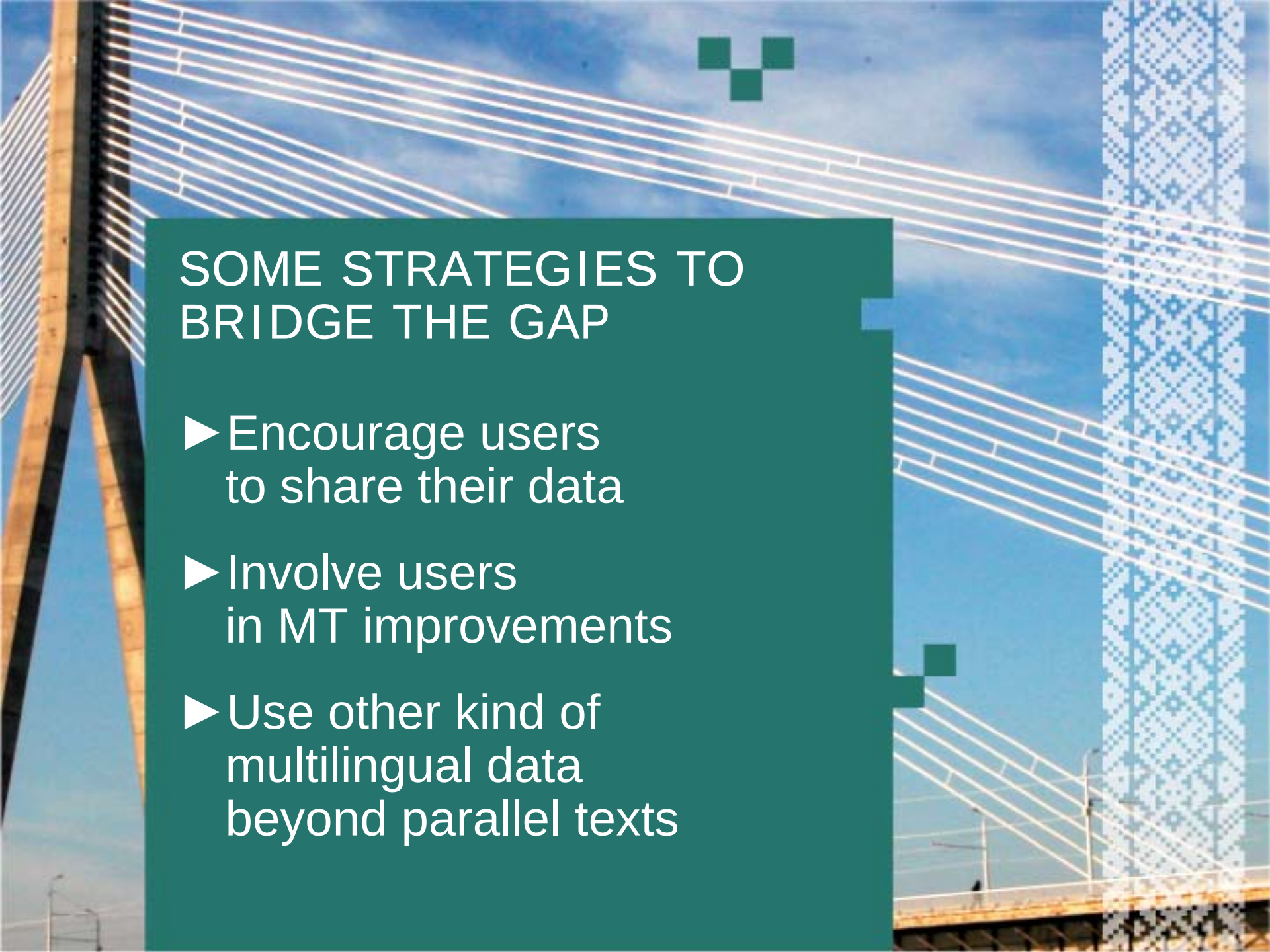
- **Statistical methods** provide breakthrough in cost-effective MT development
- Quality of SMT systems largely **depends on the size** of training data
- To overcome gap in SMT language and domain coverage and to improve quality much larger volume of training **data is needed**
- Parallel data accessible on the web is **just a fraction** of all translated texts. Most of them still reside in the local systems of different corporations, public and private institutions, desktops of individual users.

CUSTOMIZATION CHALLENGE

- Current mass-market and online MT systems are of **general nature** and perform poorly for domain and user specific texts.
- System adaptation is prohibitively **expensive service** not affordable to smaller companies or the majority of public institutions.
- Particularly **localization industry** is not able to fully exploit the data they have.

PLATFORM CHALLENGE

- Great open source platforms like GIZA++ and Moses make it relatively easy to build MT engine.
- Still expertise and local infrastructure is needed that is not available for majority of users.



SOME STRATEGIES TO BRIDGE THE GAP

- Encourage users to share their data
- Involve users in MT improvements
- Use other kind of multilingual data beyond parallel texts

- To better exploit the huge potential of existing open SMT technologies to create an innovative online collaborative platform for data sharing and MT building.
- LetsMT! is building a platform that gathers public and user-provided MT training data and generates multiple MT systems by combining and prioritizing this data.
- LetsMT! extends the use of state-of-the-art SMT methods to data supplied by users increasing quality, scope and language coverage of machine translation.

LetsMT! Project

Let's MT!

- Sustainable user-driven MT factory on the cloud providing services for user data sharing, MT generation, customization and running.

LetsMT! Project

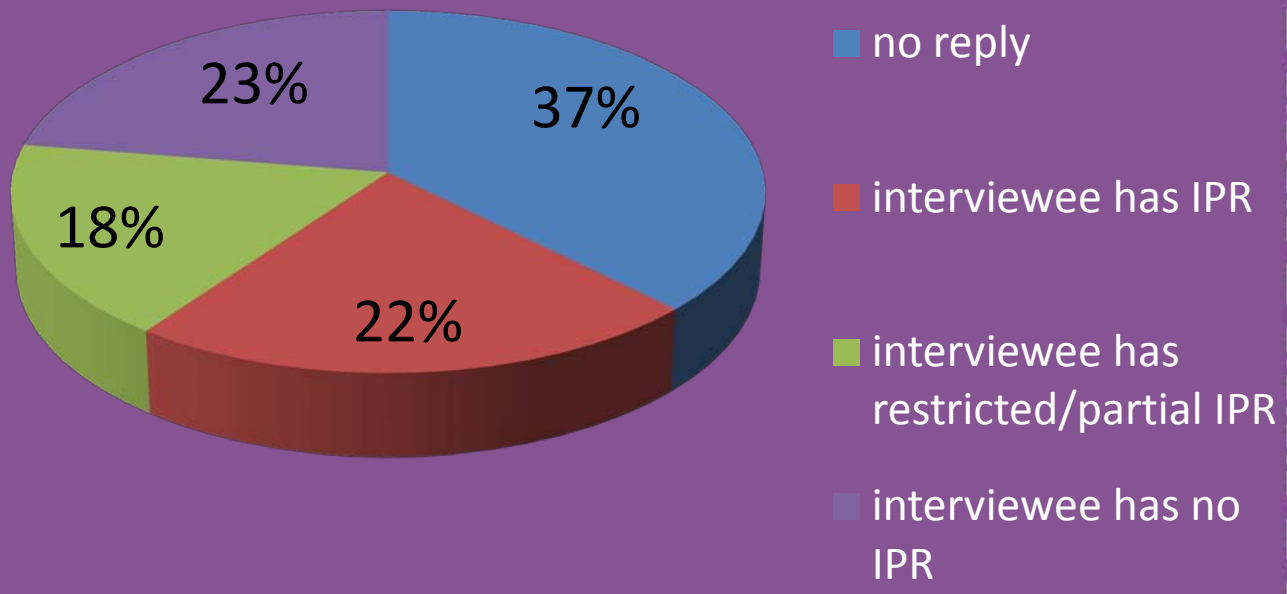
Let's MT!

- Funded under: EU Information and Communication Technologies Policy Support Programme
- Area: CIP-ICT-PSP.2009.5.1 Multilingual Web: Machine translation for the multilingual web
  - Tilde (Project Coordinator) - Latvia
  - University of Edinburgh - UK
  - University of Zagreb - Croatia
  - Copenhagen University - Denmark
  - Uppsala University - Sweden
  - Moravia – Czech Republic
  - SemLab – Netherlands

LetsMT! Project

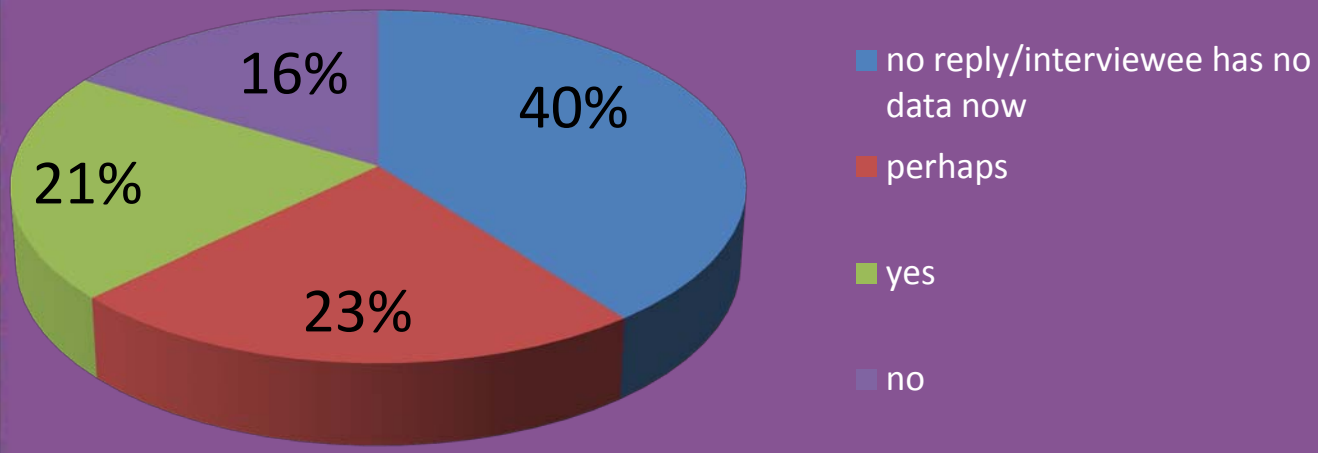
Let's MT!

USER SURVEY: IPR OF TEXT RESOURCES IN INTERVIEWEE ORGANIZATIONS



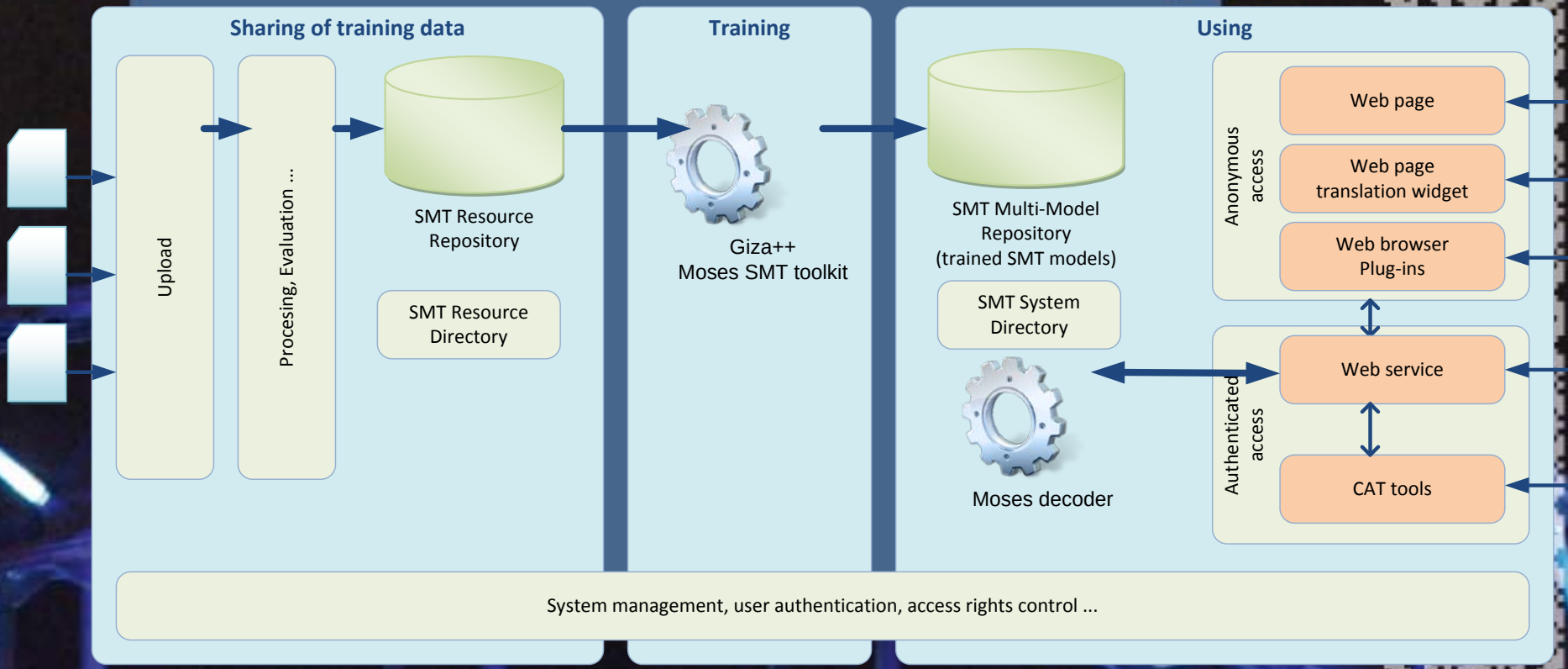
Let's MT!

USER SURVEY: WILLINGNESS TO SHARE DATA



Let's MT!

SOFTWARE ARCHITECTURE



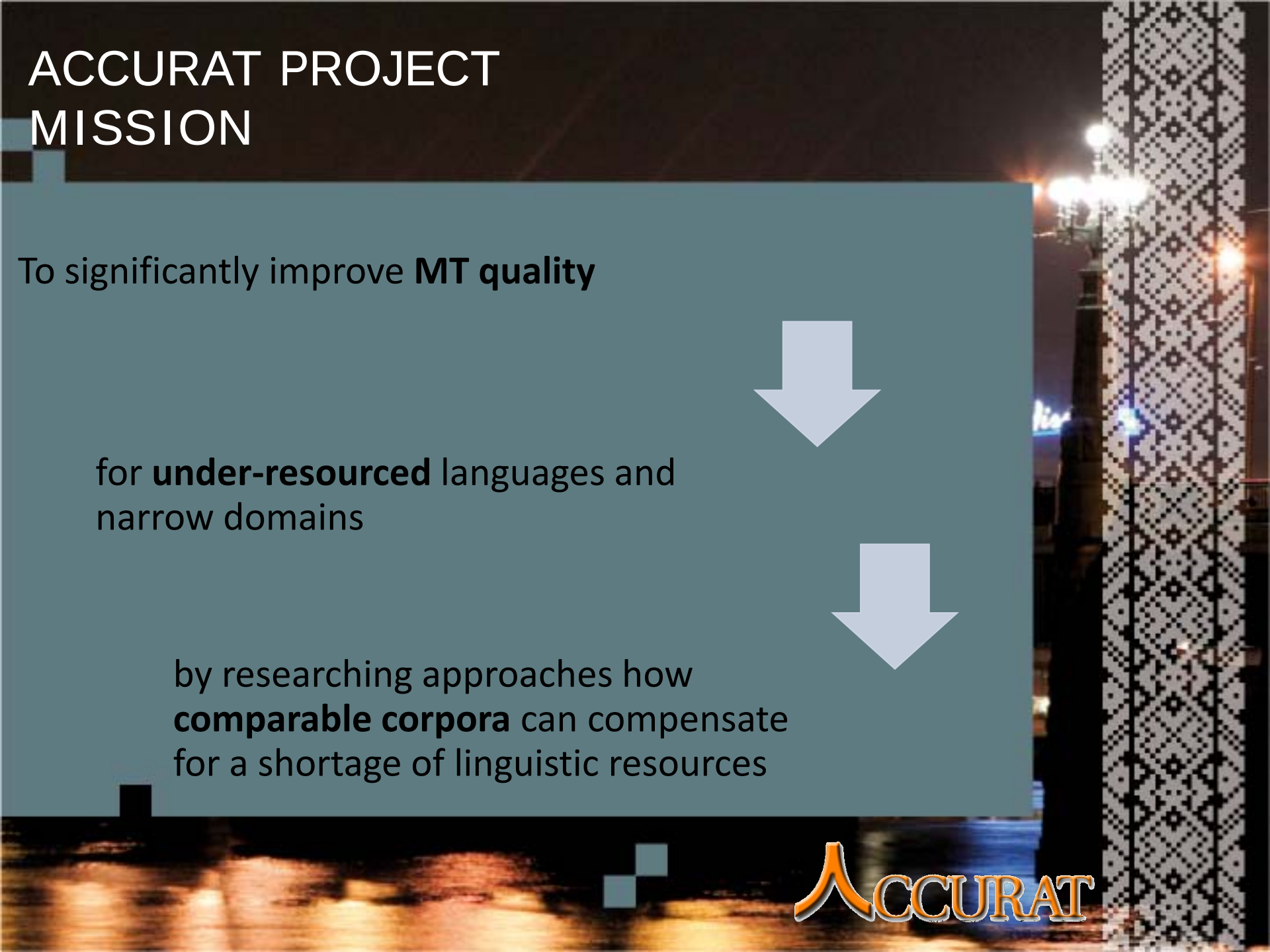
Let's MT!

ACCURAT PROJECT MISSION

To significantly improve **MT quality**

for **under-resourced** languages and narrow domains

by researching approaches how **comparable corpora** can compensate for a shortage of linguistic resources



COMPARABLE CORPORA

- Non-parallel bi- or multilingual text resources
- Collection of documents that are:
  - gathered according to a set of criteria
    e.g. proportion of texts of the same genre in the same domains in the same period
  - in two or more languages
  - containing overlapping information
- Examples:
  - multilingual news feeds,
  - multilingual websites,
  - Wikipedia articles,
  - etc.

ACCURAT

COMPARABILITY SCALE

parallel corpora	• texts which are true and accurate translations; • texts which are approximate translations;
strongly comparable corpora	• texts from the same source on the same topic with the same editorial control; • independently written texts on the same topic;
weakly comparable corpora	• texts in the same narrow subject domain and genre; • texts within the same broader domain and genre but varying in subdomains and specific genres;
Non-comparable	• pairs of texts drawn at random from a pair of very large collections of texts (e.g. the web) in the two languages

ACCURAT

KEY RESEARCH QUESTIONS

How to measure comparability?

How to collect comparable corpora?

How to extract linguistic data for MT from comparable corpora?

How to get most out of the data to improve SMT and RBMT?

How to evaluate effect of our methods?

ACCURAT

ACCURAT KEY OBJECTIVES

- To create comparability metrics - to develop the methodology and determine criteria to measure the comparability of source and target language documents in comparable corpora
- To develop, analyze and evaluate methods for automatic acquisition of comparable corpora from the Web
- To elaborate advanced techniques for extraction of lexical, terminological and other linguistic data from comparable corpora to provide training and customization data for MT
- To measure improvements from applying acquired data against baseline results from SMT and RBMT systems
- To evaluate and validate the ACCURAT project results in practical applications

ACCURAT

ACCURAT LANGUAGES

- Focus on under-resourced languages
  Latvian, Lithuanian, Estonian, Greek, Croatian, Romanian, Slovenian
- Major translation directions
  e.g. English-Lithuanian. English-Croatian, German-Romanian
- Minor translation directions
  e.g. Lithuanian-Romanian, Romanian-Greek and Latvian-Lithuanian
- Methods will be adjustable to the new languages and domains and language independent where possible
- Applicability of methods will be evaluated in usage scenarios

ACCURAT

ACCURAT PROJECT PARTNERS

- Tilde (Project Coordinator) - Latvia
- University of Sheffield - UK
- University of Leeds - UK
- Athena Research and Innovation Center in Information Communication and Knowledge Technologies - Greece
- University of Zagreb - Croatia
- DFKI - Germany
- Institute of Artificial Intelligence - Romania
- Linguatec - Germany
- Zemanta - Slovenia

ACCURAT


APPLICATION IN LOCALIZATION

EVALUATION OF EN-LV MT IN LOCALIZATION

- Goal: Increase in productivity of translators without degrading quality of translations
- Average increase of translators productivity: **32.9%**
- Increase of error rate from **20.2** to **28.6** points but still at the level "**GOOD**" (<30 points)

STANDARDIZATION/BEST PRACTICE NEEDS

- Web is becoming increasingly spoiled with low quality machine translated pages.
- Tagging MT translated texts would help to avoid this data in MT training corpora.
- Better domain/industry classification and related tags would help in collecting industry specific MT training data.
- Common interfaces for MT engines would facilitate interoperability and integration in applications.


LET'S HELP SMALLER LANGUAGES TO BRIDGE TECHNOLOGICAL GAP!
letsmt.eu
accurat-project.eu
tilde.com
Andrejs Vasiljevs
andrejs@tilde.com
TILDE