

Evaluation of SMT in localization to under-resourced inflected language

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Localization Work

- ❑ The localization process is generally related to the **cultural adaptation** and **translation** of software, video games, and websites, and less frequently to any written translation
- ❑ Translation Memory is commonly used
- ❑ MT is not yet widely used in practical localization, some use-cases and application areas for few larger languages

Previous Work – MS Research

- Evaluation with keyboard-monitoring program and Choice Network Analysis for measuring the effort involved in post-editing MT output (O'Brien, 2005)
- Productivity tests have been performed in translation and localization industry settings at Microsoft (Schmidtke, 2008)
 - SMT system of Microsoft Research trained on MS tech domain for 3 languages for Office Online 2007 localization task: Spanish, French and German
 - By applying MT to all new words on average 5-10% productivity was gained.

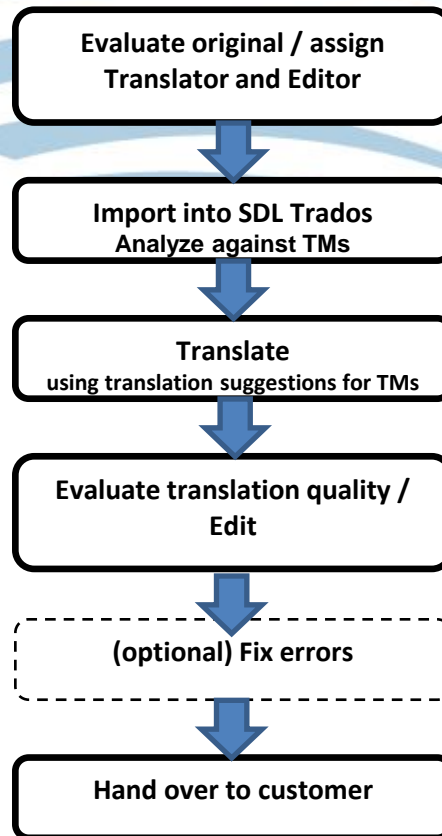
Previous Work – Adobe

- ❑ In Adobe two experiments were performed (Flournoy and Duran, 2009):
 - Small test set of 800-2000 words was machine translated and post-edited
 - Then, based on the positive results, about 200,000 words of new text were localized
 - The rule-based MT was used for translation into Russian (PROMT) and SMT for Spanish and French (Language Weaver)
 - Productivity increase between 22% and 51%

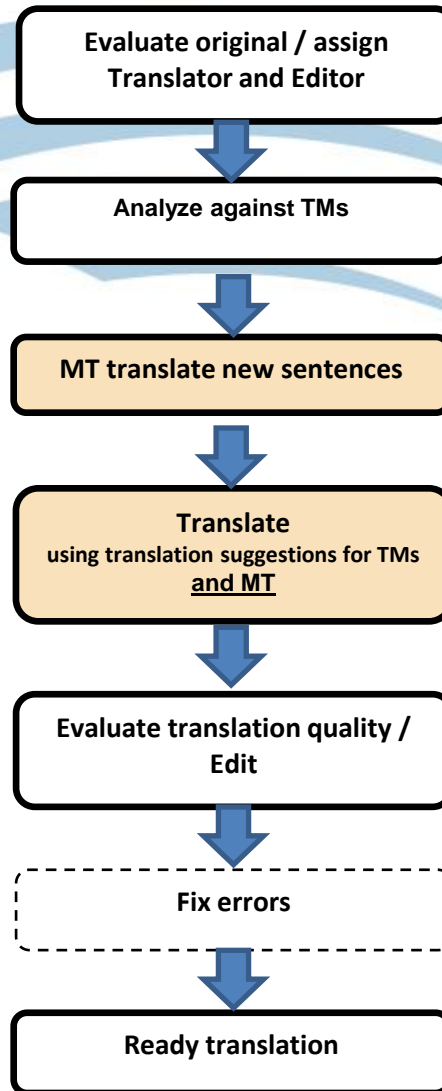
Previous Work – Autodesk

- ❑ Evaluation of Autodesk Moses SMT system (Plitt and Masselot, 2010):
 - Translation from English to French, Italian, German and Spanish with three translators for each language pair
 - To measure translation time special workbench was designed to capture keyboard and pause times for each sentence
 - MT allowed translators to improve their throughput on average by 74%
 - Varying increase in productivity: from 20% to 131%
- Optimum throughput has been reached for sentences of around 25 words in length

Localization workflow at Tilde



MT Integration into Localization Workflow



Evaluation of Productivity

- ❑ Productivity of translation process without degradation of quality is the most important measure that is interesting for localization industry
- ❑ Measured as translation output of average translator in words per hour
- ❑ Both experienced translators and new translators were involved

Evaluation of Quality

- ❑ Performed by human editors as part of their regular QA process
- ❑ Result of translation process was evaluated, editors did not know was or was not MT applied to assist translator
- ❑ Comparison to reference is not part of this evaluation
- ❑ Tilde standard QA assessment form will be used covering at least the following text quality areas:
 - Accuracy
 - Spelling and grammar
 - Style
 - Terminology
- ❑ Error score was calculated.
Metric calculated by counting errors identified by the editor and applying a weighted multiplier based on the severity of the error type.

QA Evaluation Form

Error Category	Weight	Amount of errors	Negative points
1. Accuracy			
1.1. Understanding of the source text	3		0
1.2. Understanding the functionality of the product	3		0
1.3. Comprehensibility	3		0
1.4. Omissions/Unnecessary additions	2		0
1.5. Translated/Untranslated	1		0
1.6. Left-overs	1		0
Total			0
2. Language quality			
2.1. Grammar	2		0
2.2. Punctuation	1		0
2.3. Spelling	1		0
Total			0
3. Style			
3.1. Word order, word-for-word translation	1		0
3.2. Vocabulary and style choice	1		0
3.3. Style Guide adherence	2		0
3.4. Country standards	1		0
Total			0
4. Terminology			
4.1. Glossary adherence	2		0
4.2. Consistency	2		0
Total			0
Additional plus points for style (if applicable)			0
Grand Total			0
Negative points per 1000 words			0
Quality:			Resulting Evaluation

QA Scores

Error Score (sum of weighted errors)	Resulting Quality Evaluation
0...9	Superior
10...29	Good
30...49	Mediocre
50...69	Poor
>70	Very poor

Tilde Localization QA assessment to be applied in LetsMT! evaluations

The MT system used

- ❑ English-Latvian
- ❑ Factored phrase-based SMT system
- ❑ Tools: Moses, Giza++, SRILM, Latvian morphological analyzer
- ❑ Monolingual corpus: 391 M words
- ❑ Parallel corpora:

Corpora	Size (M, sentences)
DGT-TM	1.06
OPUS EMEA	0.97
Localization TM	1.27
Dictionary	0.51
Web comparable corpus	0.90
Books	0.66
Total:	4.10

The MT system

- Development and evaluation data
 - Development - 1000 sentences
 - Evaluation – 500 sentences
 - Balanced
 - BLEU score: 35.0
 - SMT system **is not** in domain

Topic	Percentage
General information about European Union	12%
Specifications, instructions and manuals	12%
Popular scientific and educational	12%
Official and legal documents	12%
News and magazine articles	24%
Information technology	18%
Letters	5%
Fiction	5%

Integration in SDL Trados

- SDL Trados 2009 plug-in using standard MT integration approach described in SDL Trados SDK

The screenshot displays the 'LetsMT! Machine Translation Provider, En_Lv TM - Translation Results' window. It shows a list of source and target text segments. Three numbered callouts (1, 2, 3) are placed above the window, with arrows pointing to specific elements:

- Callout 1 points to the 'Project Settings...' button in the top toolbar.
- Callout 2 points to the '82%' quality score in the first row of the translation results table.
- Callout 3 points to the 'AT' provider name in the second row of the translation results table.

Source Text	Quality	Provider	Target Text
1 Click the button to see the demo.	82%		Noklikšķiniet uz pogas, lai skatītu demonstrāciju.
2 Click another button to see the demo again.	AT		Noklikšķiniet uz citas pogas, lai skatītu demonstrāciju.

Source Text	Provider	Target Text	Quality
1 Click the button to see the demo.	AT	Noklikšķiniet uz pogas, lai skatītu demonstrāciju.	P
2 Click another button to see the demo again.			P
3 Click the button to see the demo again.			P

Integration of MT in SDL Trados

The screenshot displays the SDL Trados Studio interface. The main window is titled "SDL Trados Studio - Save a message.docx_en-US_lv-LV". The menu bar includes File, Edit, View, Translation, Format, Project, Tools, and Help. The toolbar contains various icons for file operations and editing. The left sidebar shows a project tree with "Save a message.docx [Tr" and sub-items "Table", "Table Row", and "Table Cell". The main editor area is split into two panes. The top pane, titled "LetsMT! Machine Translation Provider, Prom_EN-LV_TM_en-US_lv-LV - Translation Results", shows a message: "Press CTRL+V to paste the contents from the Windows clipboard into the document." Below this, a table displays the translation results. The bottom pane, titled "Save a message.docx [Translation en-US_lv-LV]", shows the source text with line numbers 34 through 40. The status bar at the bottom indicates "INS", "100.00%", and "0.00%".

Machine Translation Provider	2/28/2011 4:39:46 PM
Machine Translation Provider, Prom_EN-LV_TM_en-US_lv-LV - Translation Resu...	Concordance Search Comments
34 of the message.	
35 Press CTRL+C to copy the contents to the Windows clipboard.	P
36 Open a Word document.	P
37 Press CTRL+V to paste the contents from the Windows clipboard into the document.	P
38 Click the File tab.	P
39 Click Save .	P
40 Save the header and body	P

Results of the First Evaluation

- ▶ Moses based EN->LV SMT (BLEU score 35.0)
- ▶ 5 translators, 54 documents with 950-1050 adjusted words each
- ▶ Average increase of translators productivity: **32.9%**
- ▶ Increase of error score from **20.2** to **28.6** points but still at the level "**GOOD**" (<30 points)



Let's MT!

Thank you!

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Let's MT!

