Using speech technology in the translation process workflow in international organizations: A quantitative and qualitative study

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Background

- Automatic speech recognition (ASR) systems: contribute to ergonomics, productivity and quality of many situations in our daily lives

- Improvements in Machine Translation (MT) quality and the increasing demand for translations, post-editing has become a popular practice in the translation industry
  - Larger volumes of translations while saving time and costs

- Not many experiments have been conducted on how an interplay between ASR and MT fields can be used to improve translation process workflows within international organizations
Previous Work

Surveying the potential of using speech technologies for post-editing purposes in the context of international organizations: What do professional translators think?

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Attitude towards different methods of translation

- Research with 6 international organizations (5 in Geneva, 1 Luxembourg).

- No previous quantitative experiments on speech based post-editing according to our knowledge.
**Objective**

- **Quantitative** and **Qualitative** research on the usage of speech and post-editing in the trade domain, in an international organization.

- Analysis on how different methods affect translation process
  - Post-editing using typing or speech
  - Speaking out the entire translation (while using MT as an inspiration)
Key areas explored in this research

- Post-Editing machine translation suggestions by typing *(PE)*

- Speaking out the translation instead of typing (with MT as an inspiration) *(RES)*

- Post-Editing using speech: (very!!) less explored *(SPE)*
Resources

- 3 professional translators from international organizations
- Trados Studio was used as the translation workbench
- Dragon Professional was integrated as the speech recognition support for the experiment
- Neural machine translation engines trained specifically using trade domain English and French parallel data were used as MT suggestions
Designing the experiment using Dragon and Trados

- Training translator profiles, adding domain specific vocabulary, using built-in commands as well as training new commands to navigate through Trados using Dragon speech
Trados setup

Speech Toolbar

MT Suggestion

Translation
Experiment

- Three professional translators were asked to translate three different texts (average length of 180 words) of the trade domain using:
  - post-editing the MT suggestions by typing (PE)
  - speaking the translation with MT as an inspiration (RES)
  - editing the MT suggestion using speech (SPE)

- Translation performances of each of the three methods were compared against using BLEU and Translation Error Rate (HTER) scores
## Results

<table>
<thead>
<tr>
<th>Method Used</th>
<th>Average BLEU score</th>
<th>Average HTER score</th>
<th>Average Time taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post-editing via typing (PE)</td>
<td>36.55</td>
<td>0.48</td>
<td>28 mins</td>
</tr>
<tr>
<td>Speaking the entire translation (RES)</td>
<td>28.19</td>
<td>0.55</td>
<td>35 mins</td>
</tr>
<tr>
<td>Speech based post-editing (SPE)</td>
<td>48.74</td>
<td>0.375</td>
<td>20 mins</td>
</tr>
</tbody>
</table>
Observations

- Editing MT using speech (SPE) results in a better BLEU score with less edits made, compared to the two other methods (PE, RES)

- Respeaking the translation (RES) obtains the worst BLEU and TER scores, suggesting that the changes do not improve the quality

- Time used for translating is reduced when using speech based methods, compared to typing

- Qualitative evaluation indicates that translators prefer both methods using speech to typing, since using speech allows them to translate longer segments faster and to think aloud while dictating
Conclusion and Future work

- With high quality ASR and MT support, ASR has the potential to increase the quality of the translation by optimally intermingling with machine translation support.

- To the best of our knowledge, this is the first quantitative study conducted on using post-editing and speech together in large scale international organizations.

- Future work
  - experimenting with more participants with written/spoken post-editing
  - evaluating temporal/technical effort, translator satisfaction
THANK YOU