In search of an acceptability/ unacceptability threshold in machine translation post-editing automated metrics

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CPSL Language Services

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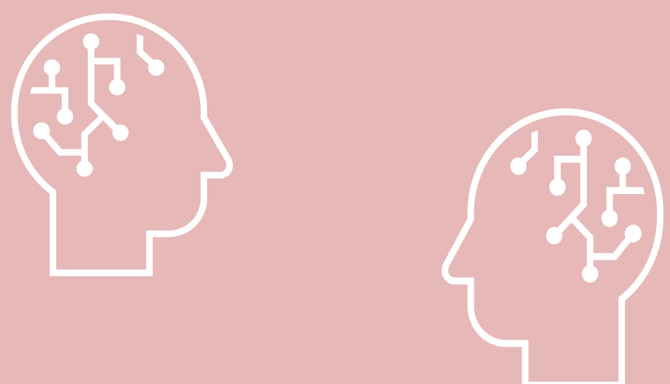
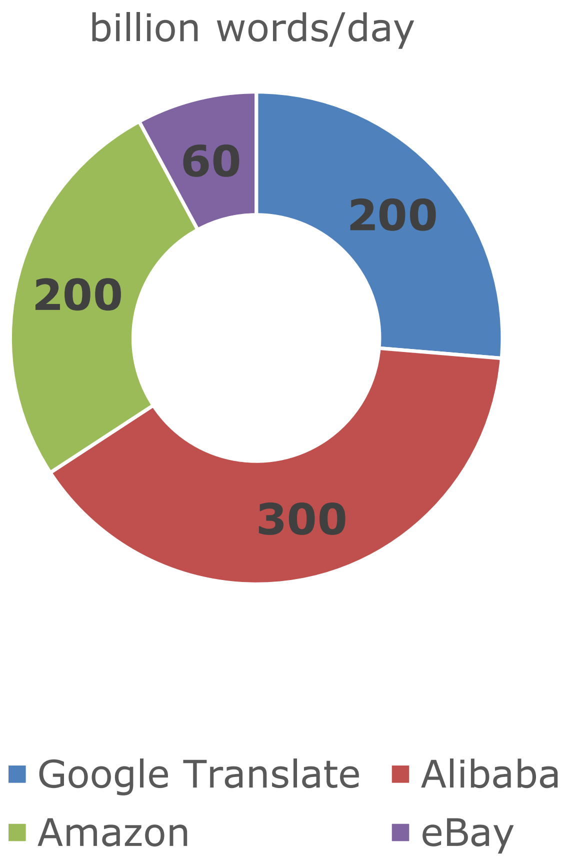
Why MT?

'Machines translate more in a day than all human translators on the planet combined can do in a year'

Nimdzi Research/TAUS, 2018





MT main use cases and drivers

Translation for understanding:
raw MT / light postediting

- E-commerce platforms
- Forums and user reviews
- Support pages
- Communication apps

To cut costs and/or improve deadlines:
light / full post-editing

MT at CPSL

SMT: Moses, ModernMT
NMT: Marian, 3rd-party platforms
RBMT: Apertium

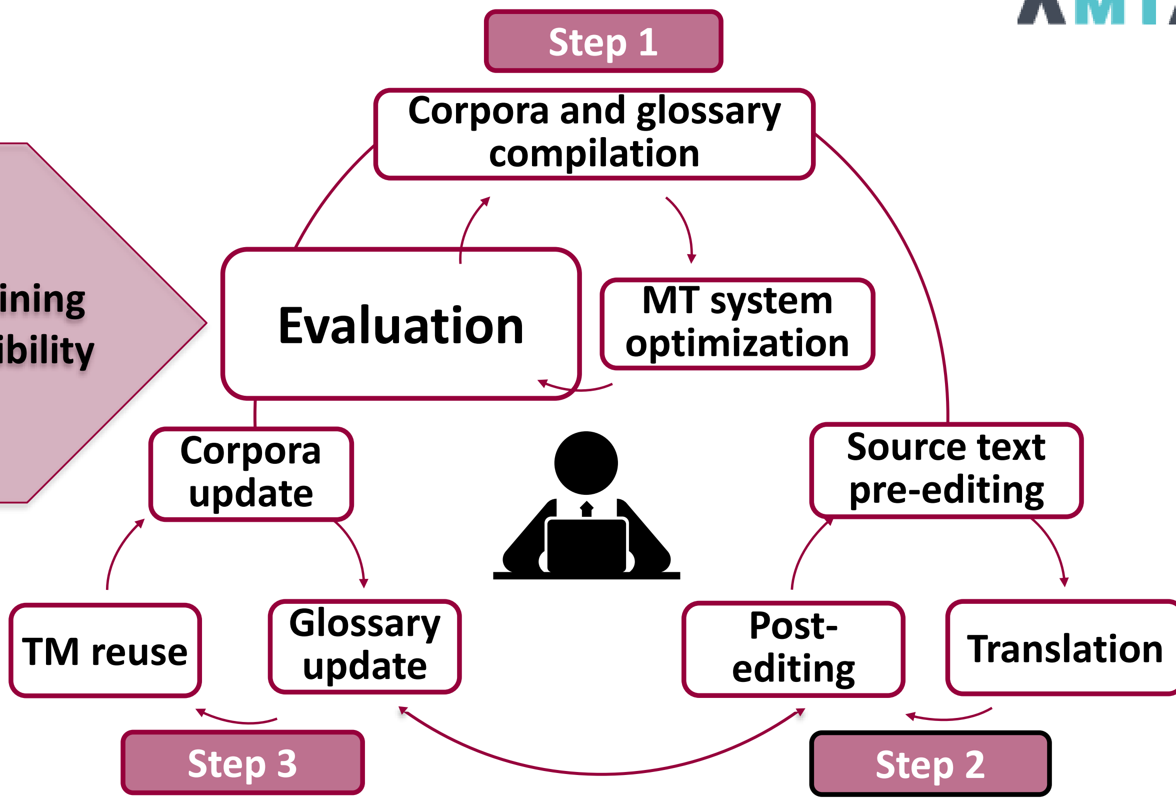
Generic systems
and
Domain-based systems:

- Life sciences
- Medical devices
- Automotive
- Technical

Translator-centered MT workflow

MT evaluation:

- **during MT system training**
- **to determine MT eligibility**
- **after post-editing**



Rico, Celia. 2017. La formación de traductores en traducción automática. *Revista Tradumàtica. Tecnologies de la traducció*, 15, pages 75-96

MT evaluation

Holistic (adequacy/fluency) scoring
Perceived PE effort scoring

Reference-based metrics
(BLEU, edit distance, (H)TER…)

Productivity tests: post-editing time

Analytical: all/main errors, categorized

MT feedback template

MT raw output feedback

Project ref.	Source	Raw MT output	Post-edited text	Error Category (drop-down menu)	Error Subcategory (drop-down menu)	Severity (drop-down menu)	Comments

accuracy
language
terminology
style
country_standards
layout
query implementation
client edit

Overall feedback

Please score the MT raw output quality from 1 (worst) to 4 (best):

Please leave a comment on the post-editing task:

Why…

… combining different types of evaluation?

- Human judgement alone is valuable but subjective
- Metrics alone are not enough

Combined metrics give meaningful information

Why…

… searching for an acceptability threshold?

- Define goals when training systems
- Know when to retrain a system
- Cherry-picking projects for MT
- Avoid discussions on remuneration

What % of edit distance is acceptable/unacceptable for post-editing?

Previous studies

On acceptability:

- Castilho, S. (2016): “Measuring Acceptability of Machine Translated Enterprise Content”. Dublin City University, Dublin, Ireland.

On correlation between automated metrics and human judgement:

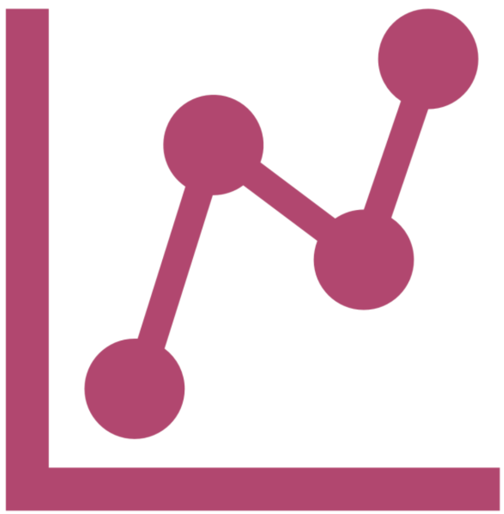
- Fomicheva, M.; Specia, L. (2019); “Taking MT Evaluation Metrics to Extremes: Beyond Correlation with Human Judgments”. On *Computational Linguistics*, Association for Computational Linguistics, Stroudsburg, USA.
- Scarton, C.; Forcada, M.; Esplà-Gomis, M.; Specia, L. (2019): “Estimating post-editing effort: a study on human judgements, task-based and reference-based metrics of MT quality”. Proceedings of IWSLT 2019, Hong Kong, China.

Hypothesis:

50% is too high as an edit distance threshold to define acceptability of MT raw output

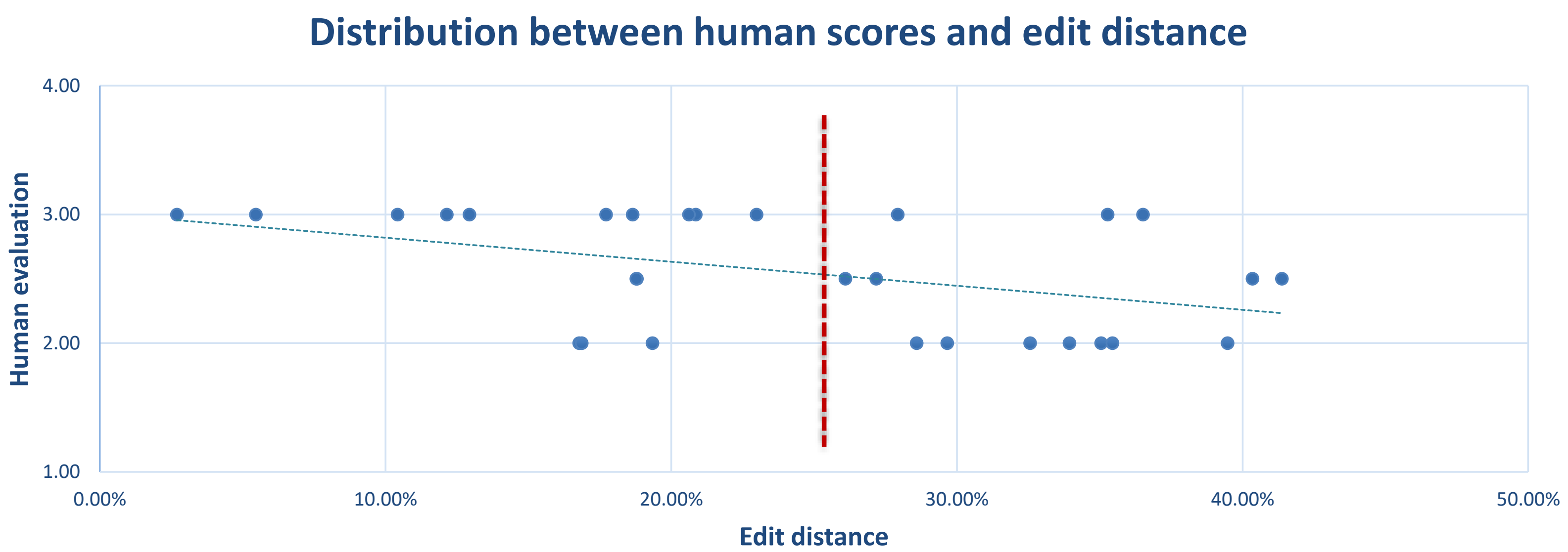
Description of study

- 29 evaluations
  - Automated metrics: edit distance (Levenshtein algorithm from nltk.metrics)
  - Human evaluation after post-editing: PE effort perceived (1-4 Likert scale)
- 3 MT systems: Marian, Google Translate Basic and GT Advanced
- Evaluators’ profile: professional post-editors
- 10 language combinations and 6 subject areas



- Limitations:
  - Usually only 1 post-editor (and evaluator) per project
  - Likert scores are subjective
  - Metrics result from comparing with the final version (sometimes there is an extra review)
  - Too few evaluations

Correlation table

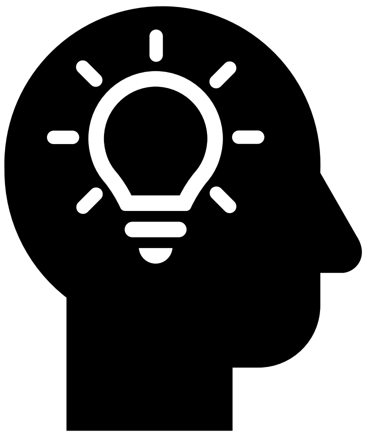


Interpretation

- Raw MT output scores: 2-3
- Most edit distances: 15%-45%
- Correlation? A high edit distance usually has a low score, and the other way around (but note the exceptions)
- According to the specific comments, 3 is usually related to good quality, whereas 2 seems to be closer to unacceptability

Possible interpretation:
with an edit distance > 30%, post-editors expect an improvement of the raw MT output in the next job

Ideas for further study



Collect more samples

Involve +1 evaluator in each sample

Correlate with analytical evaluations

Define better the 1-4 Likert scale

Questions?

Thank you!

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