Tapadóir: Statistical Machine Translation for Irish

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An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

Outline

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Motivation for implementing a SMT system

- Current demand for translated content exceeds the capacity of the DAHG's translation team
- Previously:
  - SDL Trados (TM)
  - Not suitable for previously unseen text
  - If low % TM match, must be translated from scratch
- Clear need for something which would speed up the translator's work, while also being domain-specific

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The Tapadóir Project

Main goals:

- Build a SMT engine tailored to the translation needs of the DAHG
  - Domain-specific
  - User-friendly and non-disruptive to the usual workflow
- Gather and curate appropriate data
- Explore algorithmic parameters to best fit the language(s) and use case

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Defining a Use-Case

During the Pilot phase, translators were consulted to identify the type of text Tapadóir will be used to translate

- reports, staff notices, communications, annual reports, etc
- a formal tone and at times, a high register

This also established a translator feedback loop, which is now used for identifying areas for improvement

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Acquiring Data

- Previous publicly available corpora:
  - **Parallel English–Irish corpus of legal texts (Paradocs)**[1]**:** English-Irish corpus of legal texts
  - **Corpas Comhthreomhar Gaeilge-Béarla (CCGB)**[2]**:** Bilingual corpus crawled from the web
- Corpora gathered by Tapadóir:
  - **General domain data:** Data crawled using the ILSP web-crawler[3]
  - **Domain-specific data:** Translation memories received from the Dept. of Arts, Heritage and the Gaeltacht and the Joint Research Centre of the European Commission

[1] www.gaois.ie
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Increased bilingual corpora

Table of Irish-English corpora gathered

Corpus	**Size(lines)**	**Size(words)**
Paradocs	89,000	1,526,498
CCGB	6,000	113,889
DAHG (baseline)	29,000	67,418
DAHG (Additional)	13,500	68,691
Crawled (cleaned)	10,000	183,999
Crawled (uncleaned)	55,000	1,062,942
DCEP & DGT-TM	29,000	439,262

Table 1 : Current data sets collected for Irish↔English MT. Word counts given for the English files only.

Developing a test set

- 1500 sentences of gold-standard TM data provided by DAHG
- Domain-specific
- Representative of the type of text Tapadóir will need to translate
- Used to evaluate using automatic metrics

SMT Engine

- Built using Moses 2.0 (Baseline) and Moses 3.0 (Current)
- 6-gram language model
- Trained using combinations of previously mentioned corpora
- KenLM

System Setting Modifications

- **Tuning**
  - Performed on a held-out section of 3000 domain-specific sentence pairs
- **Hierarchical-based model**
  - Reordering table changed from phrase-based to hierarchical
  - Better able to handle larger ordering differences – treats adjacent pairs as one unit

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Post-Processing Module

Automated Post-Editing

- corrects common MT mistakes
- uses Irish surface orthography rather than deeper morphological analysis
- aims to improve grammar and readability
- *ag mé** → *agam*
  *ag an baile** → *ag an mbaile*

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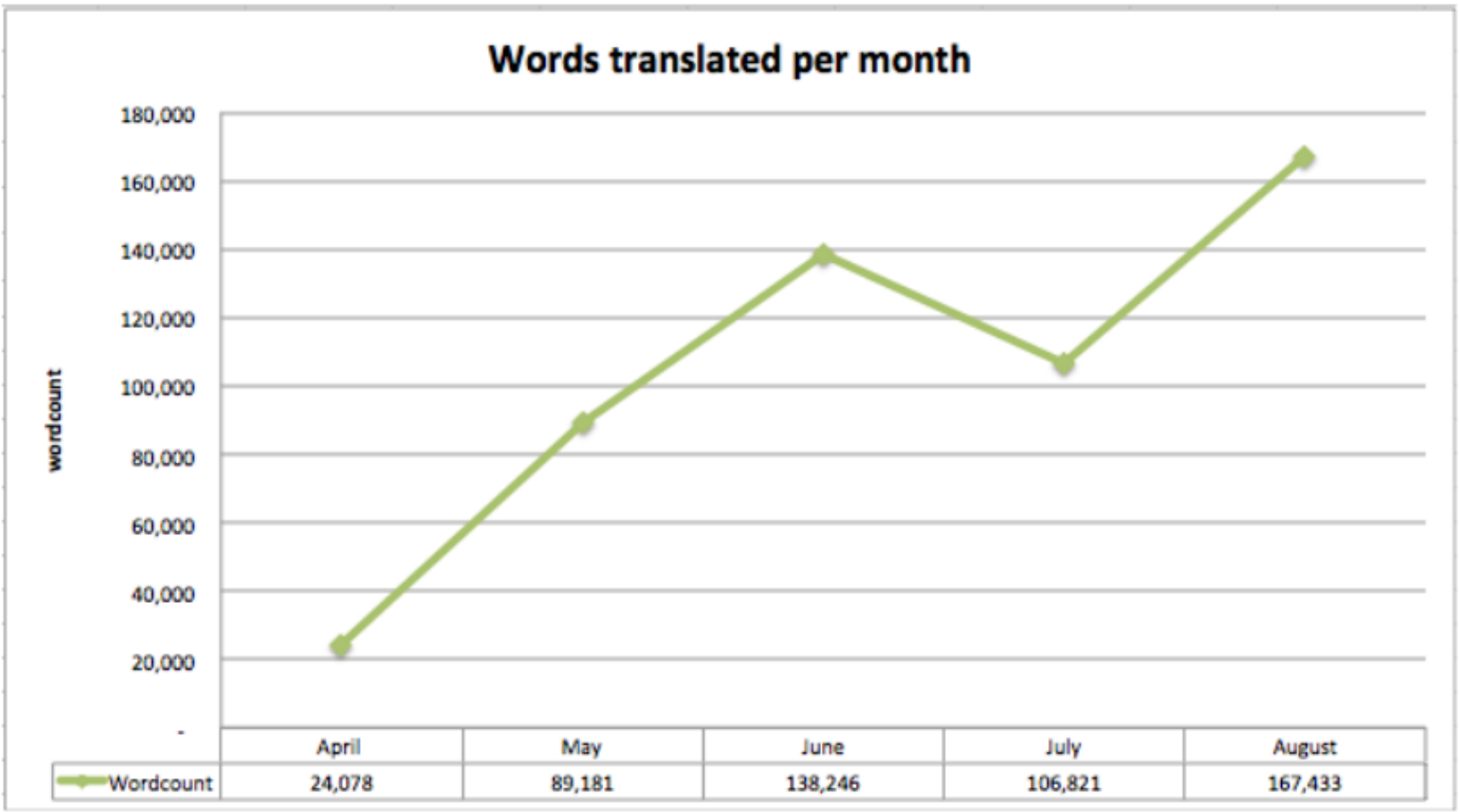
System Results

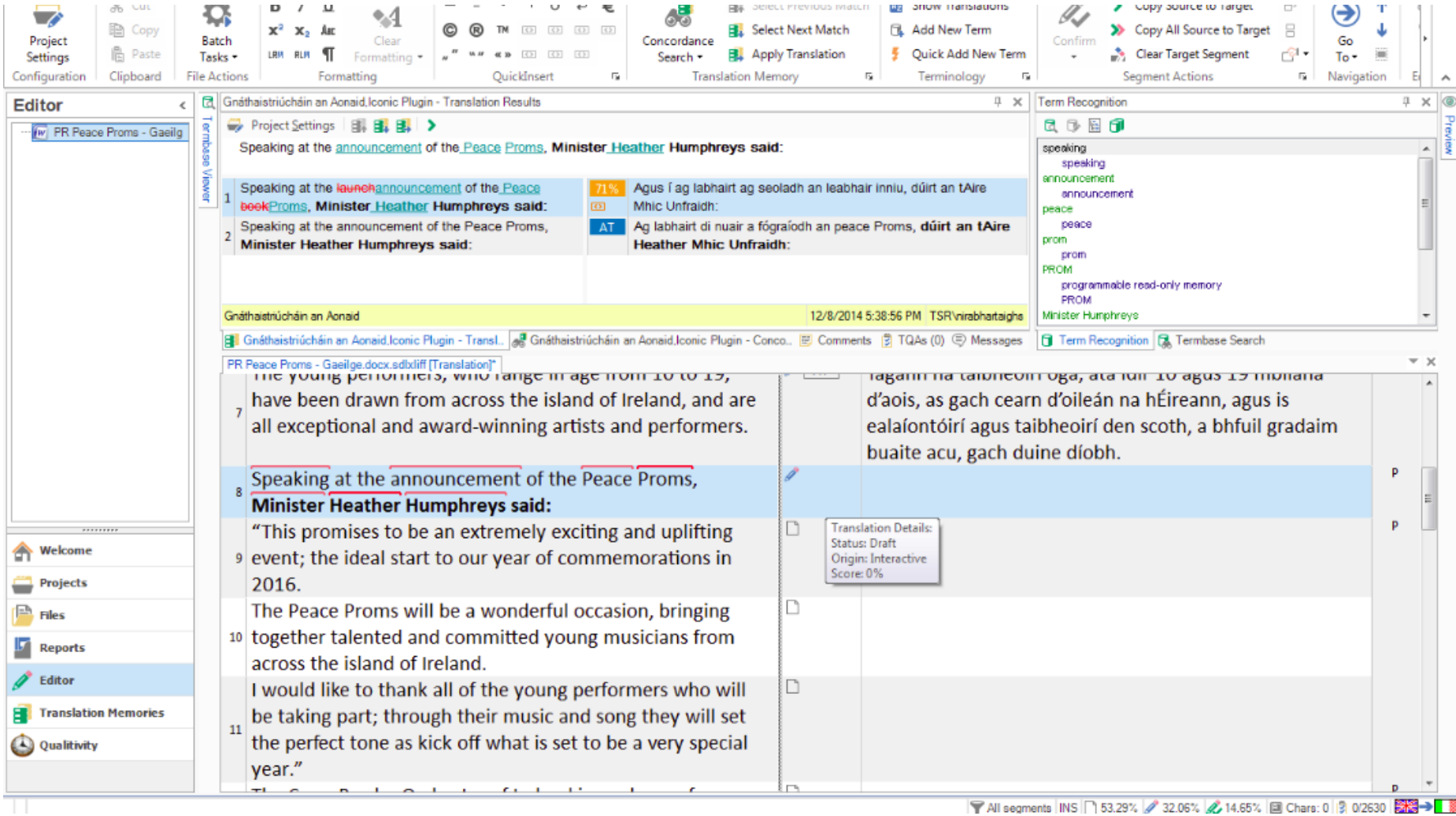
	BLEU
Google	33.91
Tapadóir (Baseline)	39.44
Tapadóir (Current)	43.19

Table 2 : Comparison of results for Google Translate, our baseline system and our current system

Increased MT usage



Integration into DAHG translation workflow



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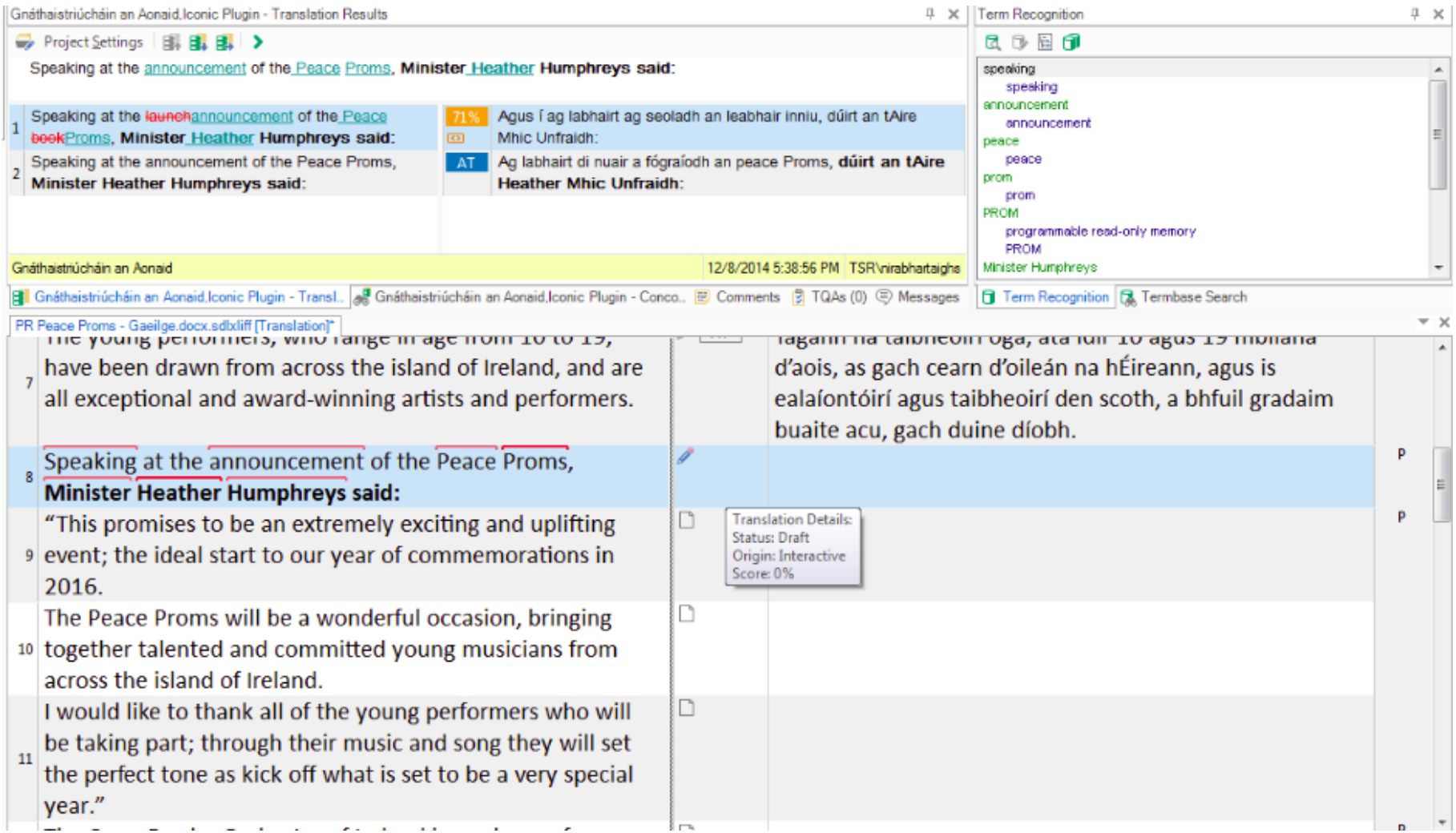

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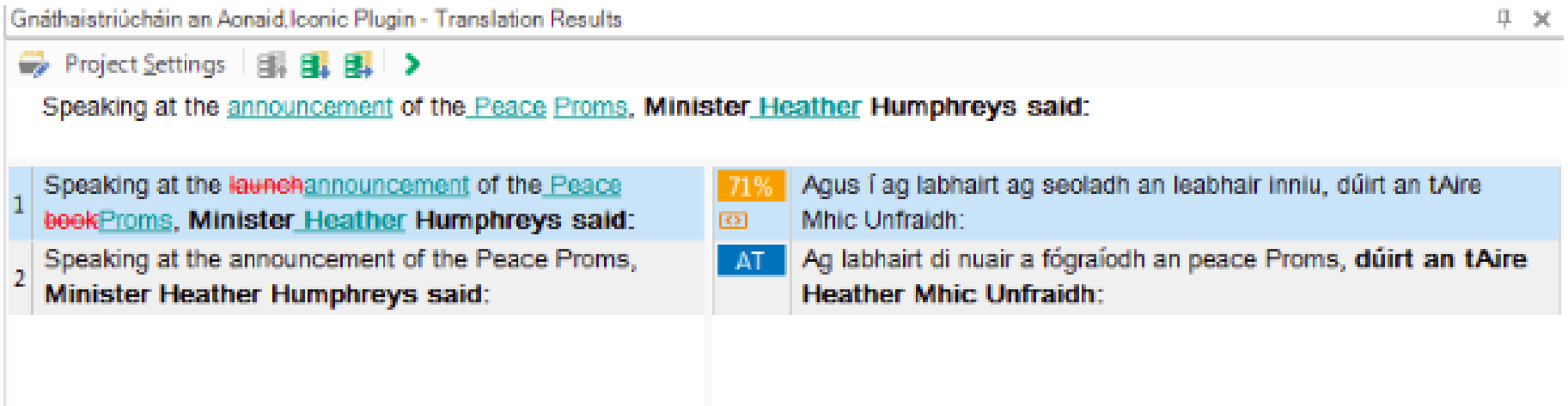

Typical MT errors

- Incorrect case used
- Inaccurate reordering - especially with longer sentences
- Copula constructions

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Ongoing and Future Work

- Gather additional general-domain parallel data
- **Source-side re-ordering**
  To address divergent word order (SVO–VSO)

  SRC: The timeframe can be extended
  RO: can The timeframe be extended
  REF: 'Is féidir an tráthchlár a shíneadh'
- **Factored Models**
  Using a POS-tagger (Uí Dhonnchadha), build a language model which contains grammatical information

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Ongoing and Future Work

- DAHG vision for a Shared Translation Service
- Interest from DGT
- ELRC helping data gathering cause
  - DAHG helping to identify and gather public admin data from around the country

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Conclusion

- Clear need for further research in English-Irish MT
- Clear need for new methods in overcoming the morphology problem/ lack of data problem

Conclusion

Go Raibh Maith Agaibh!
(Thank You!)