

What's on an annotator's mind? Analysis of error typologies to highlight machine translation quality assessment issue

Emmanuelle Esperança-Rodier
Université Grenoble Alpes - LIG

Our objectives

- Quality Assessment
- Qualitative annotated data
- Preliminary approach to intra-annotator work
- To what extent the choice of a typology implies a bias in the annotators' work?

What's on an annotator's mind?

01.

PROJECT

Typologies
ACCOLÉ
Annotator

02.

METHODOLOGY

Data
MT Systems
Process

03.

RESULTS

Quantitative
Qualitative

What's on an annotator's mind?

01.

PROJECT

Typologies
ACCOLÉ
Annotator

02.

METHODOLOGY

Data
MT Systems
Process

03.

RESULTS

Quantitative
Qualitative

Vilar's typology

(Vilar et al., 2006)

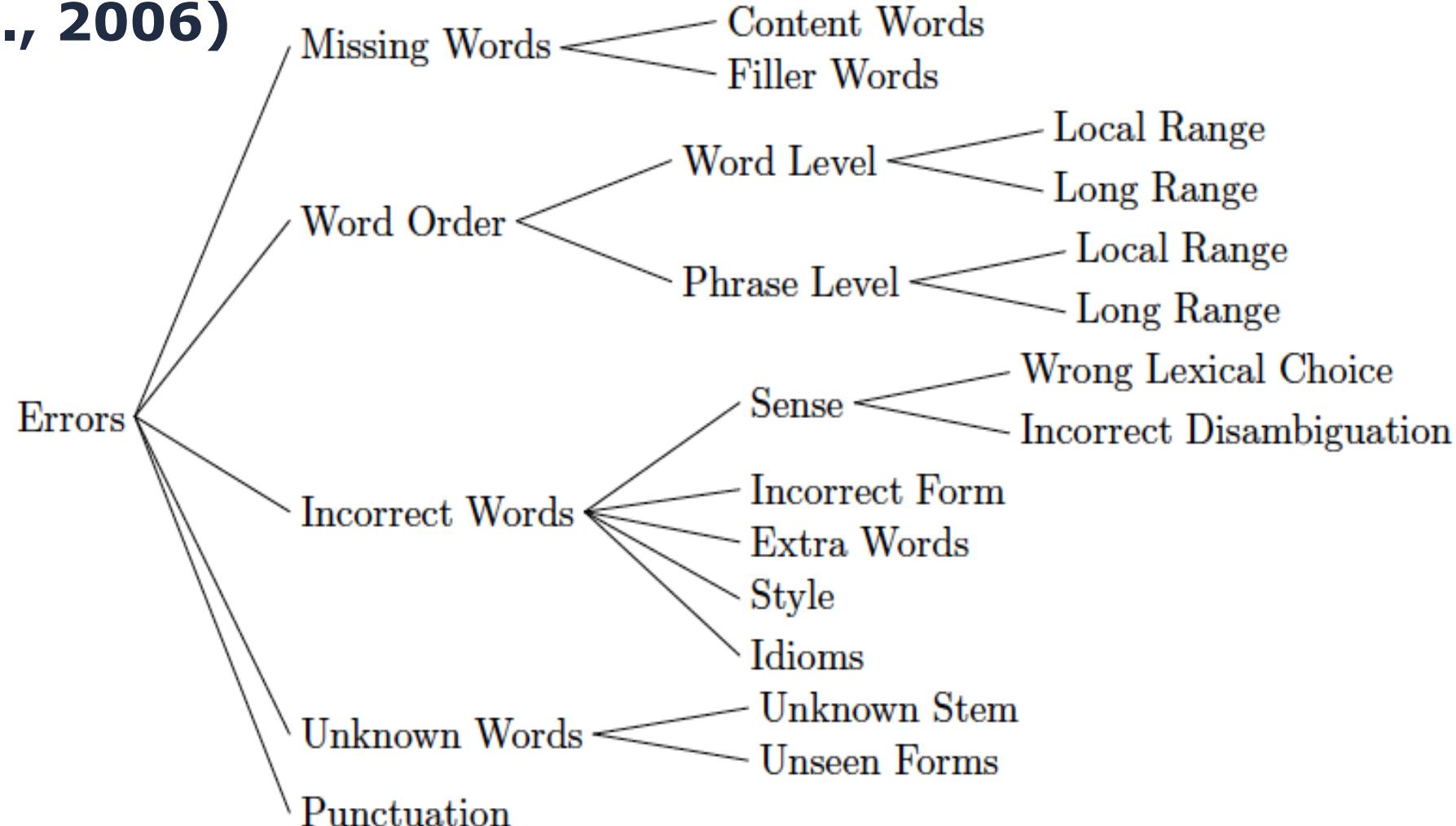
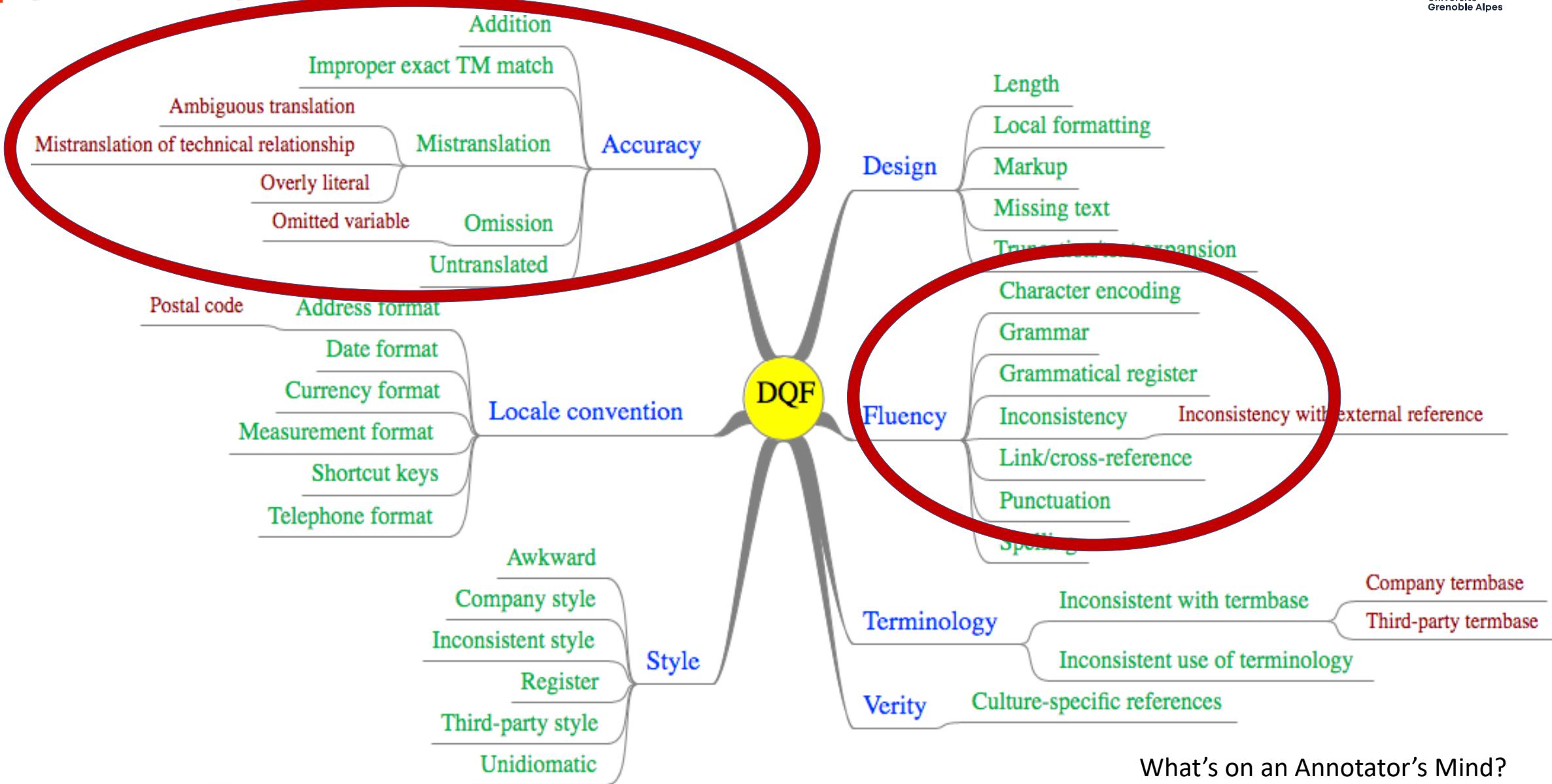


Figure 1: Classification of translation errors.

DQF-MQM



[Tableau des couples](#)
[Valider le couple courant ✓](#)
[Aller au couple suivant ➤](#)

Etape 1 : sélectionner les mot(s)

Phrase source ↗

Mais ceci n'est possible que si le rôle de la subsidiarité horizontale est clairement énoncé, ce qui n'a pas été le cas dans les traités européens, la Charte des Droits fondamentaux ou le travail de la Convention européenne.

Phrase cible ↗

But this is possible if the role of the horizontal subsidiarity is clear, this was not the case in the case in the European Charter of Human Rights or the work of the European Convention on Human Rights.

Etape 2 : créer l'erreur

Source

clairement

Cible

clear

Actions

[Ajouter l'erreur](#)

Récapitulatif

[Supprimer des erreurs](#)

Source

0

Cible

EU

Erreur

Inconnu

Actions

énoncé

que

,

Mots signifiants

Mots signifiants

- p - Ponctuation
- Mots inconnus
- fmv - Forme non vue
- Mots inconnus > Radical
- i - Inconnu
- Mots incorrects
- fi - Forme incorrecte
- id - Idiome
- ms - Mots supplémentaires
- s - Style
- Mots incorrects > Sens
- ✓ mc - Mauvais choix lexical
- md - Mauvaise désambiguisation
- Mots manquants
- mo - Mots outils
- msi - Mots signifiants
- Ordre des mots > Mot
- omh - Hors syntagme
- oms - Syntagme
- Ordre des mots > Segment
- osh - Hors syntagme
- oss - Syntagme

Annotator

- Native English Speaker
- French Speaker: C2 level CEFR
- Undergraduate Student – Literature and Modern Languages
 - Uni. Of Exeter

What's on an annotator's mind?

01.

PROJECT

Typologies
ACCOLÉ
Annotator

02.

METHODOLOGY

Data
MT Systems
Process

03.

RESULTS

Quantitative
Qualitative

DATA

Document Type	Segments	Source words	MT	Target words	DQF-MQM	Vilar
Patent	9	272				

What's on an Annotator's Mind?

DATA

Document Type	Segments	Source words	MT	Target words	DQF-MQM	Vilar
Patent	9	272				
European Community Document on Climate Change	28	519				

MT Systems

Document Type	Segments	Source words	MT	Target words	DQF-MQM	Vilar
Patent	9	272	WIPO Translate N	305		
			WIPO Translate S	302		
European Community Document on Climate Change	28	519				

MT Systems

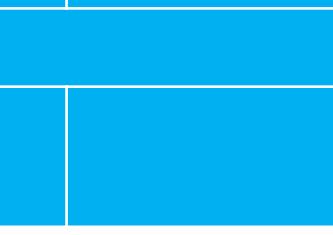
Document Type	Segments	Source words	MT	Target words	DQF-MQM	Vilar
Patent	9	272	WIPO Translate N	305		
			WIPO Translate S	302		
European Community Document on Climate Change	28	519	Canada eTranslation	768		
			CANADA legacy MT@EC	776		

Annotations

Document Type	Segments	Source words	MT	Target words	DQF-MQM	Vilar
Patent	9	272	WIPO Translate N	305	Brad Pitt 11 annotations	
			WIPO Translate S	302	George Clooney 25 annotations	
European Community Document on Climate Change	28	519	Canada eTranslation	768		
			CANAD legacy MT@EC	776		

What's on an Annotator's Mind?

Annotations

Document Type	Segments	Source words	MT	Target words	DQF-MQM	Vilar
Patent	9	272	WIPO Translate N	305		Hawaii 13 annotations
			WIPO Translate S	302		Madagascar 29 annotations
European Community Document on Climate Change	28	519	Canada eTranslation	768		
			CANAD legacy MT@EC	776		

What's on an Annotator's Mind?

Annotations

Document Type	Segments	Source words	MT	Target words	DQF-MQM	Vilar
Patent	9	272	WIPO Translate N	305	Brad Pitt	
			WIPO Translate S		11 annotations	13 annotations
	28	519	Canada eTranslation	768	George Clooney	
			CANAD legacy MT@EC		25 annotations	29 annotations
European Community Document on Climate Change					Jude Law 35 annotations	
					Robert 51 annotations	

What's on an Annotator's Mind?

Annotations

Document Type	Segments	Source words	MT	Target words	DQF-MQM	Vilar
Patent	9	272	WIPO Translate N	305	Brad Pitt	Hawaii
			WIPO Translate S		11 annotations	13 annotations
	28	519	Canada eTranslation	768	George Clooney	Madagascar
			CANAD legacy MT@EC		25 annotations	29 annotations
European Community Document on Climate Change				Jude Law 	Nouvelle Calédonie	
				35 annotations	36 annotations 	New Zealand
					59 annotations	

What's on an Annotator's Mind?

Annotations

Document Type	Segments	Source words	MT	Target words	DQF-MQM	Vilar
Patent	9	272	WIPO Translate N	305	Brad Pitt	Hawaii
			WIPO Translate S		11 annotations	13 annotations
	28	519	Canada eTranslation	768	George Clooney	Madagascar
			CANAD legacy MT@EC		25 annotations	29 annotations
European Community Document on Climate Change	28	519	Canada eTranslation	768	Jude Law	Nouvelle Calédonie
			CANAD legacy MT@EC		35 annotations	36 annotations
	28	519	Canada eTranslation	776	Robert	New Zealand
			CANAD legacy MT@EC		51 annotations	59 annotations

What's on an annotator's mind?

01.

PROJECT

Typologies
ACCOLÉ
Annotator

02.

METHODOLOGY

Data
MT Systems
Process

03.

RESULTS

Quantitative
Qualitative

Global Quantitative Results

Rank	DQF-MQM	VILAR	
1	Accuracy> Mistranslation	38% Incorrect Words> Sense> Wrong Lexical Choice	40%
2	Accuracy> Addition	16% Incorrect Words> Extra Words	17%
3	Fluency> Grammar> Word order	9% Incorrect Words> Incorrect Form	15%
4	Accuracy > Omission	7% Word Order> Word Level> Local Range	7%
5	Fluency> Grammar> Word form - Part of Speech	Punctuation 7% Incorrect Words> Style	6% 6%
6	Fluency > Typography	6% Missing Words> Filler Words	4%
	Fluency> Grammar> Word form – Agreement	6%	
7	Accuracy> Over-translation	5% Incorrect Words> Sense> Incorrect Desambiguation Word Order> Phrase Level> Local Range	2% 2%
8	Fluency> Grammar > Function Words – Incorrect	3% Missing Words> Content Words	1%
9	Accuracy> Mistranslation> Overly literal	1%	
	Fluency> Grammar> Function words – Extraneous	1%	
	Fluency> Grammar > Function Words – Missing	1%	
	Fluency> Grammar > Word form – Tense	1%	

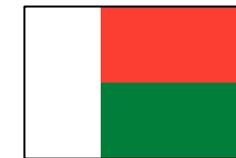
Detailed Quantitative Results – DQF-MQM



DQF-MQM	Brad Pitt	George Clooney	Jude Law	Robert	Total	Ranking					
Accuracy> Mistranslation	5	10,87%	11	23,91%	12	26,09%	18	39,13%	46	38%	1
Accuracy> Addition	0	0,00%	0	0,00%	8	42,11%	11	57,89%	19	16%	2
Fluency> Grammar> Word order	0	0,00%	5	45,45%	1	9,09%	5	45,45%	11	9%	3
Accuracy> Omission	0	0,00%	0	0,00%	4	44,44%	5	55,56%	9	7%	4
Fl> Grammar> Word form- POS	2	25,00%	3	37,50%	1	12,50%	2	25,00%	8	7%	5
Fluency> Typography	1	14,29%	0	0,00%	4	57,14%	2	28,57%	7	6%	6
Fl> Grammar> Word form-Agree	1	14,29%	4	57,14%	0	0,00%	2	28,57%	7	6%	6
Accuracy> Over-translation	2	33,33%	0	0,00%	3	50,00%	1	16,67%	6	5%	7
Fl> Grammar> Function Words-Inc	0	0,00%	1	25,00%	0	0,00%	3	75,00%	4	3%	8
Ac> Mistranslation> Overly literal	0	0,00%	0	0,00%	0	0,00%	1	100,00%	1	1%	9
Fl> Grammar> Function words-Extr	0	0,00%	1	100,00%	0	0,00%	0	0,00%	1	1%	9
Fl> Grammar> Function Words-Miss	0	0,00%	0	0,00%	1	100,00%	0	0,00%	1	1%	9
Fl> Grammar> Word form - Tense	0	0,00%	0	0,00%	0	0,00%	1	100,00%	1	1%	9
Total	11	9,09%	25	20,66%	34	28,10%	51	42,15%	121	100%	

What's on an Annotator's Mind?

Detailed Quantitative Results - Vilar



VILAR	Hawaii	Madagascar	Nouvelle Calédonie	New Zealand	Total	Ranking
Incorrect Words > Sense > Wrong Lexical Choice	5 9,09%	13 23,64%	13 23,64%	24 43,64%	55 40%	1
Incorrect Words > Extra Words	2 8,70%	1 4,35%	9 39,13%	11 47,83%	23 17%	2
Incorrect Words > Incorrect Form	3 15,00%	7 35,00%	1 5,00%	9 45,00%	20 15%	3
Word Order > Word Level > Local Range	0 0,00%	5 55,56%	0 0,00%	4 44,44%	9 7%	4
Punctuation	1 12,50%	1 12,50%	4 50,00%	2 25,00%	8 6%	5
Incorrect Words > Style	2 25,00%	2 25,00%	3 37,50%	1 12,50%	8 6%	5
Missing Words > Filler Words	0 0,00%	0 0,00%	4 66,67%	2 33,33%	6 4%	6
Incorrect Words > Sense > Incorrect Desambiguation	0 0,00%	0 0,00%	1 33,33%	2 66,67%	3 2%	7
Word Order > Phrase Level > Local Range	0 0,00%	0 0,00%	1 33,33%	2 66,67%	3 2%	7
Missing Words > Content Words	0 0,00%	0 0,00%	0 0,00%	2 100,00%	2 1%	8
Total	139,49%	2921,17%	3626,28%	5943,07%	137100%	

Qualitative Results

- SELECTION ISSUES
8 occurrences
- ANNOTATION FOR ONLY ONE TYPOLOGY
18 occurrences
94% annotated under Vilar's Typology and not MQM
6% annotated under MQM Typology and not Vilar's one

Qualitative Results

Selection Issues #1

Source: Our sustainable prosperity will depend on this.

Target: Notre prospérité durable dépendra de la présente.



Qualitative Results

Selection Issues #3

Source: Our sustainable prosperity will depend on this.

Target: Notre prospérité durable dépendra de la présente.

Incorrect Words>Sense>Wrong lexical choice

Incorrect Words>Extra Word

DQF-MQM #1

Source: this

Target: la présente

Error Type: Accuracy>Mistranslation

VILAR #1

Source: this

Target: la

Error Type:

Incorrect Words>Sense>
Wrong lexical choice

VILAR #2

Source :∅

Target: présente

Error Type: Incorrect
Words>Extra Word

Qualitative Results Selection Issues #2

Source: Canada will share expertise, best practices and lessons learned in climate action with officials from other countries, together with provinces and territories, Indigenous peoples, the business community and civil society representatives.

Accuracy> Omission

Target: Le Canada de partager l'expertise, les bonnes pratiques et les enseignements tirés dans la lutte contre le changement climatique avec des représentants d'autres pays, avec les provinces et les territoires, les peuples autochtones, le monde des affaires et des représentants de la société civile.

Accuracy> Addition

Qualitative Results

Selection Issues #2

Source: Canada will share expertise, best practices and lessons learned in climate **action** with officials from other countries, together with provinces and territories, Indigenous peoples, the business community and civil society representatives.

Target: Le Canada de partager l'expertise, les bonnes pratiques et les enseignements tirés dans **la lutte contre le changement** climatique avec des représentants d'autres pays, avec les provinces et les territoires, les peuples autochtones, le monde des affaires et des représentants de la société civile.

Incorrect Words> Sense> Wrong Lexical Choice

DQF-MQM #1

Source: action

Target: ø

Error Type:

Accuracy>Omission

#2

Source: ø

Target: la lutte contre le changement

Error Type:

Accuracy>Addition

VILAR #1

Source: action

Target: la lutte contre le changement

Error Type: Incorrect Words> Sense>

Wrong Lexical Choice

Qualitative Results Selection Issues #3

Source: Canada has long recognized the principle that free and open trade, protecting the environment and **acting on** climate change must go together.

Accuracy> Omission

Target: Le Canada reconnaît depuis longtemps le principe selon lequel le libre-échange, l'ouverture des échanges, la protection de l'environnement et le changement climatique doivent aller de pair.

Fluency> Grammar> Function Words - Missing

Qualitative Results

Selection Issues #3

Source: Canada has long recognized the principle that free and open trade, protecting the environment and **acting on** climate change must go together.

Target: Le Canada reconnaît depuis longtemps le principe selon lequel le libre-échange, l'ouverture des échanges, la protection de l'environnement et le changement climatique doivent aller de pair.

Missing Words> Filler Words

DQF-MQM #1

Source: on

Target: ø

Error Type: Fluency>

Grammar> Function Words - Missing

#2

Source: acting

Target: ø

Error Type:

Accuracy>Omission

VILAR #1

Source: acting on

Target: ø

Error Type: Missing Words>
Filler Words

Qualitative Results

Selection Issues #3

Source: The seat extender includes a longitudinally extending seat extension attached **at** a post end to a seat post which is adapted to slip into a seat tube.

Target: L'extension de siège comprend une extension de siège s'étendant longitudinalement fixée **au niveau d'une** extrémité de montant à un montant de siège qui est conçu pour glisser dans un tube de siège.

Accuracy > Over-translation

Qualitative Results

Selection Issues #3

Source: The seat extender includes a longitudinally extending seat extension attached at a post end to a seat post which is adapted to slip into a seat tube.

Target: L'extension de siège comprend une extension de siège s'étendant longitudinalement fixée au niveau d'une extrémité de montant à un montant de siège qui est conçu pour glisser dans un tube de siège.



Incorrect Words > Extra Words

DQF-MQM #1

Source: at

Target: au niveau d

Error Type:

Accuracy > Over-translation

VILAR #1

Source: Ø

Target: niveau d

Error Type: Incorrect Words
> Extra Words

What's on an Annotator's Mind?

Qualitative Results

Selection Issues #4

Source: Canada will continue to promote market mechanisms including carbon pricing, **linkages** of carbon market policies, sub-national carbon market efforts and mechanisms to promote sustainable land use.

Target: Le Canada continuera à promouvoir les mécanismes du marché, y compris la tarification du carbone, des liens politiques du marché du carbone, les efforts et les mécanismes du marché du carbone internationaux afin de promouvoir l'utilisation durable des sols.

Accuracy > Mistranslation

Qualitative Results

Selection Issues #4

Source: Canada will continue to promote market mechanisms including carbon pricing, linkages **of** carbon market policies, sub-national carbon market efforts and mechanisms to promote sustainable land use.

Missing Words> Content Words

DQF-MQM #1

Source: linkages

Target: Ø

Error Type: Accuracy>
Mistranslation

Target: Le Canada continuera à promouvoir les mécanismes du marché, y compris la tarification du carbone, des liens politiques du marché du carbone, les efforts et les mécanismes du marché du carbone internationaux afin de promouvoir l'utilisation durable des sols.

VILAR #1

Source: of

Target: Ø

Error Type: Missing Words>
Content Words

What's on an Annotator's Mind?

Qualitative Results

Annotation Issues #1

Source: Canada strongly supports the long-term goals established under the Paris Agreement and will work collaboratively with all countries to effectively implement the Agreement, to support initiatives that help Parties start implementing their commitments as early as feasible, and to continue to advocate for climate action in complementary international fora and engage with sub-national governments and non-state actors to develop **ambitious** climate solutions.

Incorrect Words > Incorrect Form

Target: Le Canada soutient fermement les objectifs à long terme établie en vertu de l'accord de Paris et travailleront en collaboration avec tous les pays pour mettre effectivement en œuvre l'accord, de soutenir des initiatives qui aident les parties à commencer à mettre en œuvre leurs engagements dès que possible, et à continuer de plaider en faveur de la lutte contre le changement climatique dans les enceintes internationales complémentaires et de dialoguer avec les gouvernements infranationaux et les acteurs non étatiques à mettre au point des solutions climatiques **ambitieux**

Qualitative Results

Annotation Issues #2

Source: **method** enables website providers to prohibit non-human users, such as programmed agents, from viewing their websites.

Target: Un **procédé** permet aux fournisseurs de site web pour interdire des utilisateurs non humains, tels que des agents programmés, de visualiser leurs sites web.

Incorrect Words> Style

Qualitative Results

Annotation Issues #3

Source: The authentication challenge is presented to a user of a computing device and the user responds to the authentication challenge by selecting one or more challenge elements in accordance with an instruction provided to the user on how to **complete** the authentication challenge.

Target: Le défi d'authentification est présenté à un utilisateur d'un dispositif informatique et l'utilisateur répond au défi d'authentification en sélectionnant un ou plusieurs éléments de défi en fonction d'une instruction fournie à l'utilisateur sur la manière de **terminer** le défi d'authentification.

Incorrect Words> Style

Qualitative Results

Annotation Issues #4

Source: Canada has long **recognized** the principle that free and open trade, protecting the environment and acting on climate change must go together.

Target: Le Canada a **admis** depuis longtemps le principe selon lequel des échanges commerciaux libres et ouverts, de la protection de l'environnement et sur le changement climatique doivent aller de pair.

Incorrect Words> Sense> Wrong Lexical Choice

Conclusion

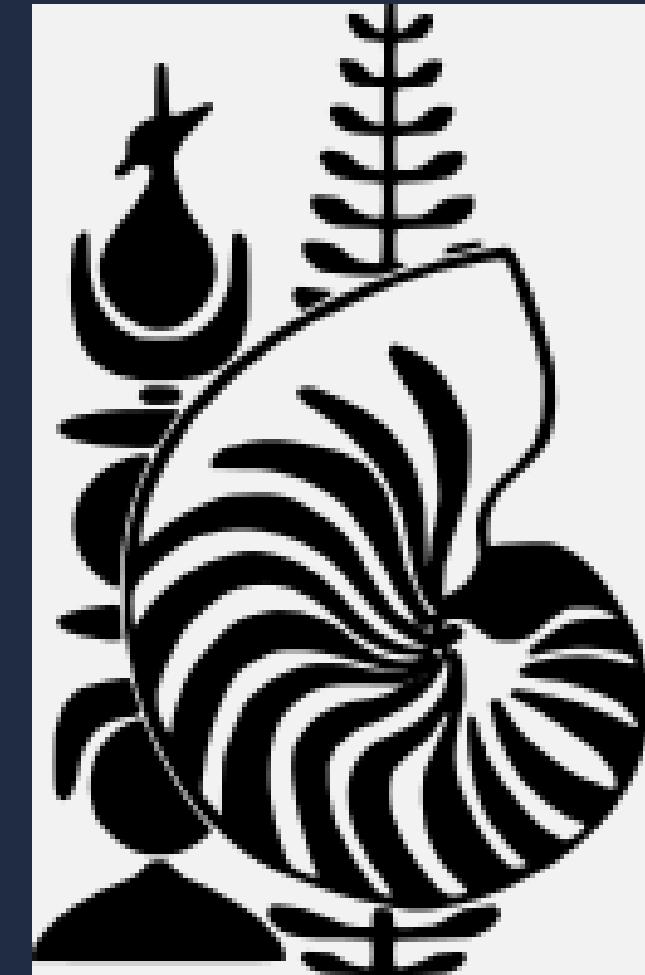
Future Work

- Typology choice impacts on the way:
 - selection of error occurrences are made
 - selection of types are made
- Typology choice impacts on the number of errors, thus on metrics
- Investigate further in that way: more annotators
- How many errors an annotator can handle?



**Thanks for
listening!**

Any questions?



What's on an Annotator's Mind?

Types not used

DQF-MQM	Vilar
Accuracy> Under-translation	Word Order> Word Level> Long Range
Accuracy> Untranslated	Word Order> Phrase Level> Long Range
Accuracy> Mistranslation > Ambiguous translation	
Accuracy> Mistranslation> Date/Time	
Accuracy> Mistranslation> Entity	
Accuracy> Mistranslation> Number	
Accuracy> Mistranslation> Should not have been translated	
Fluency> Spelling	
Fluency> Unintelligible	