Unbabel

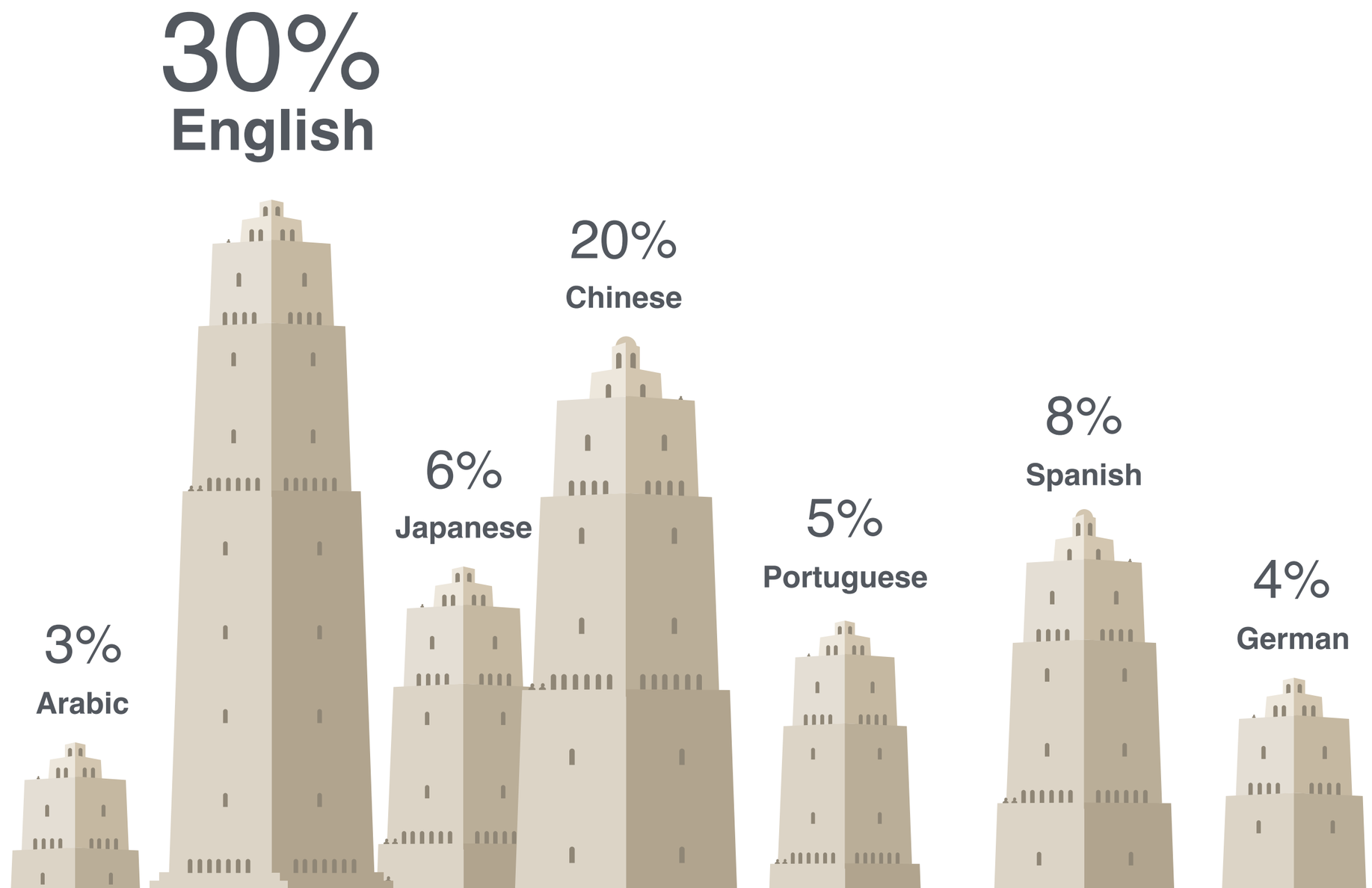
Combining Crowd and AI to **scale professional-quality translation**

João Graça
CTO

The Internet, 1997

80%
English

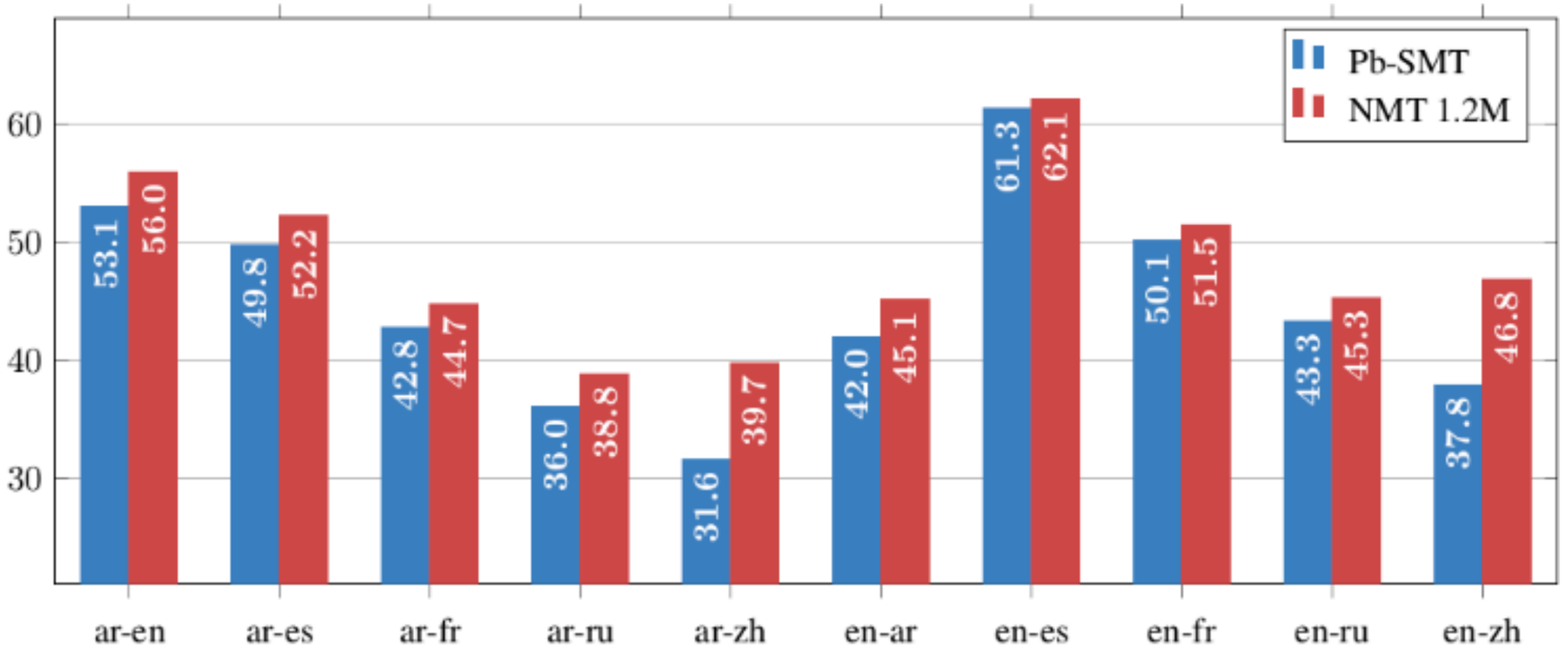
The Internet, 2017



“All translation firms together are able to translate **far less than 1%** of relevant content produced everyday”

CSA – MT Is Unavoidable to Keep Up with Content Volumes

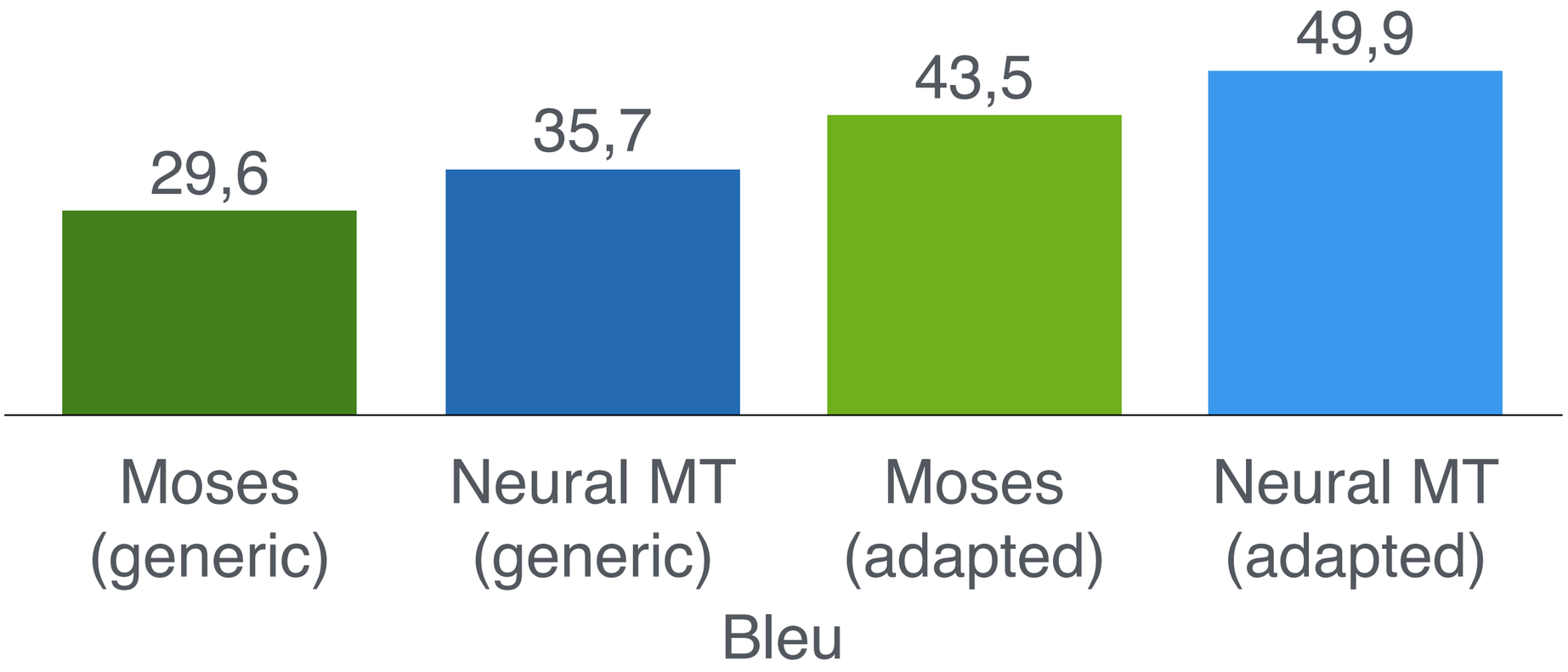
Is Machine Translation already here?



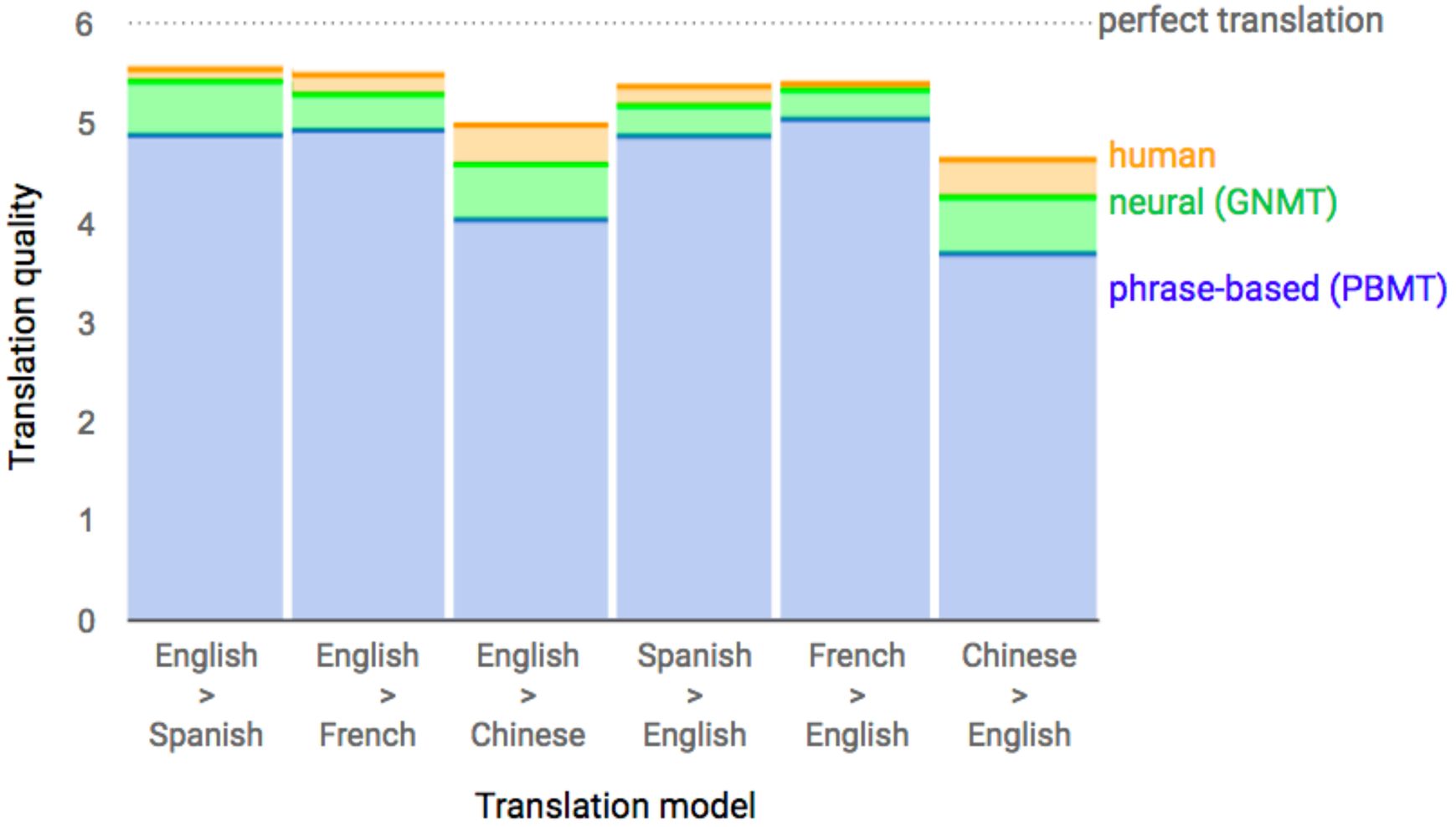
* Is Neural Machine Translation Ready for Deployment? A Case Study on 30 Translation Directions
Marcin Junczys-Dowmunt, Tomasz Dwojak, Hieu Hoang

Everyone agrees that NMT is here to stay and much better than SMT

Unbabel Experiments with Customer Service Tickets



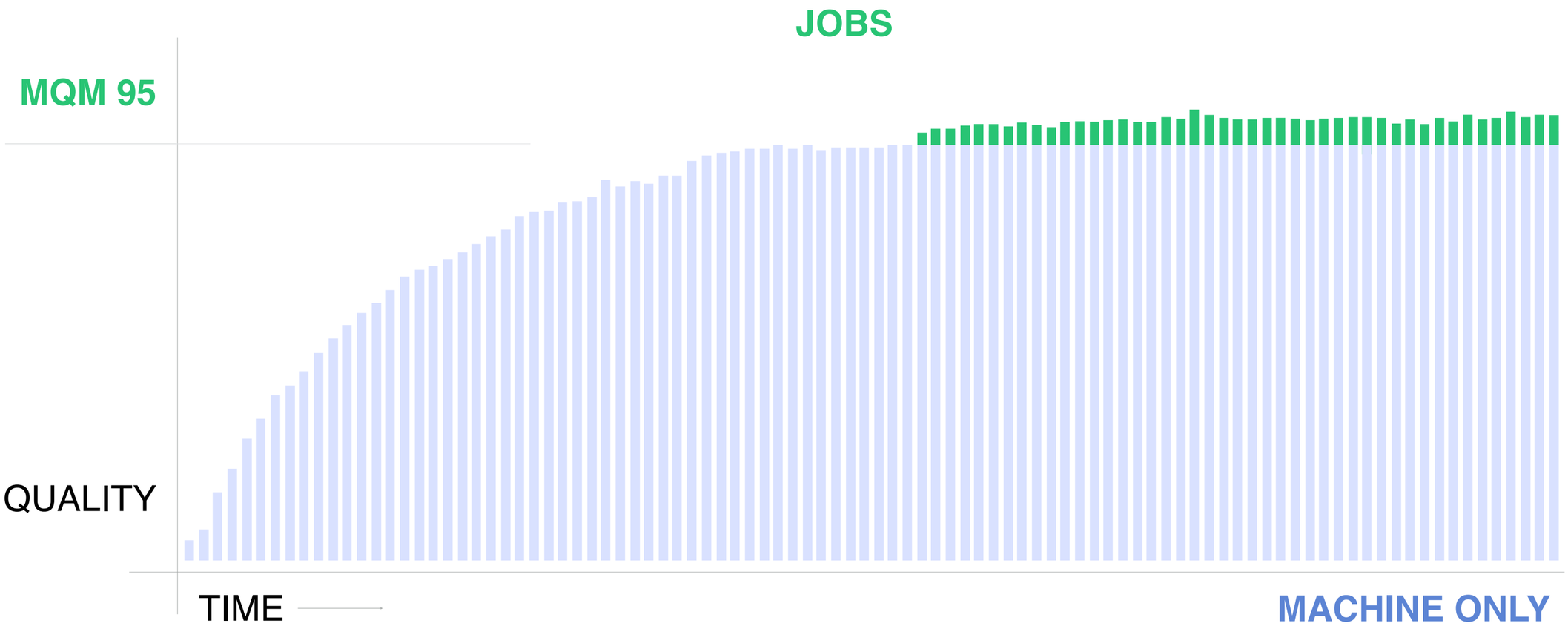
Is NMT really enough?



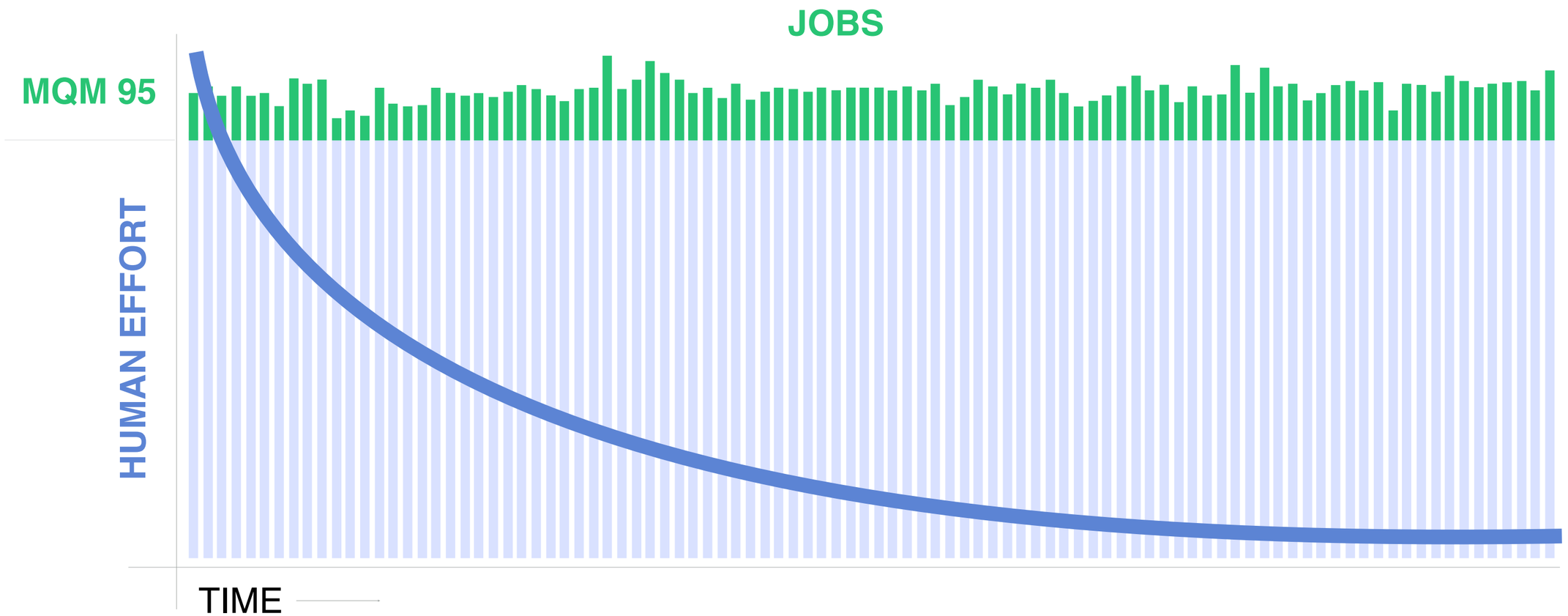
* A Neural Network for Machine Translation, at Production Scale. Google Blog

Quality per Job

Will AI solve translation?



Will AI solve translation?



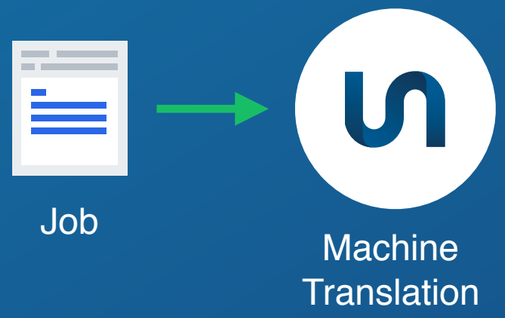
Quality per Job

Unbabel Pipeline

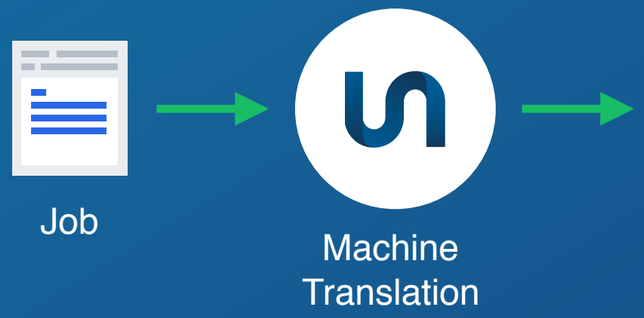
Unbabel Pipeline

Job

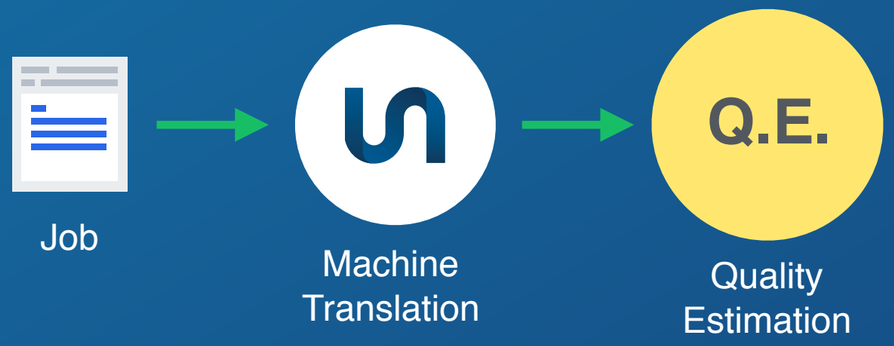
Unbabel Pipeline



Unbabel Pipeline

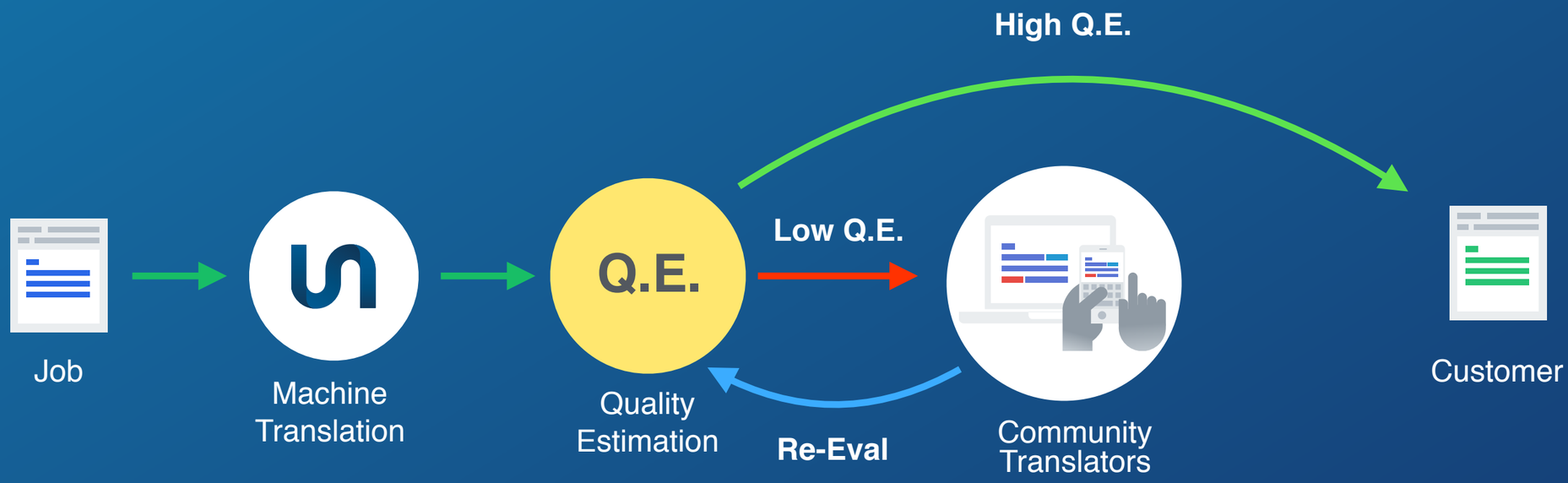


Unbabel Pipeline

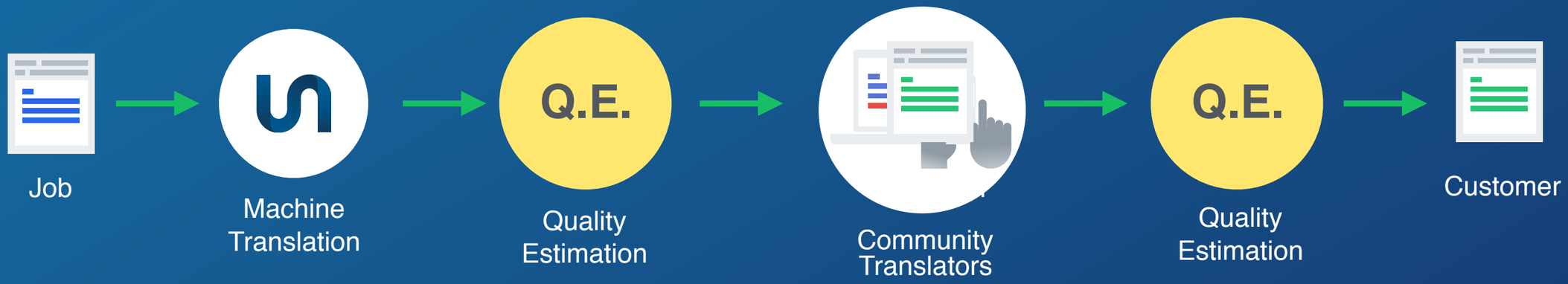


Unbabel Pipeline

Unbabel Pipeline



Data Generation Engine



Data Generation Engine

Before

Initial text

NO DATA POINTS

Submitted text

After

Initial text

All changes in between:

Mouse clicks

Key presses

Timestamps

Submitted text

Keystroke Analysis

Raw data

At 18:03:30:	At 18:03:35:	At 18:03:30:
In nugget 3	In nugget 3	In nugget 3
mouseClick	Pressed Shift	mouseClick
Cursor at 16	Cursor at 25	Cursor at 16
Selected: 0	Selected: 0	Selected: 0
At 18:03:31:	At 18:03:35:	At 18:03:31:
In nugget 3	In nugget 3	In nugget 3
Pressed Backspace	Pressed s	Pressed Backspace
Cursor at 16	Cursor at 25	Cursor at 16
Selected: 0	Selected: 0	Selected: 0
At 18:03:31:	At 18:03:35:	At 18:03:31:
In nugget 3	In nugget 3	In nugget 3
Pressed Backspace	Pressed i	Pressed Backspace
Cursor at 15	Cursor at 26	Cursor at 15
Selected: 0	Selected: 0	Selected: 0
At 18:03:31:	At 18:03:35:	At 18:03:31:
In nugget 3	In nugget 3	In nugget 3

Processed information

Initial text

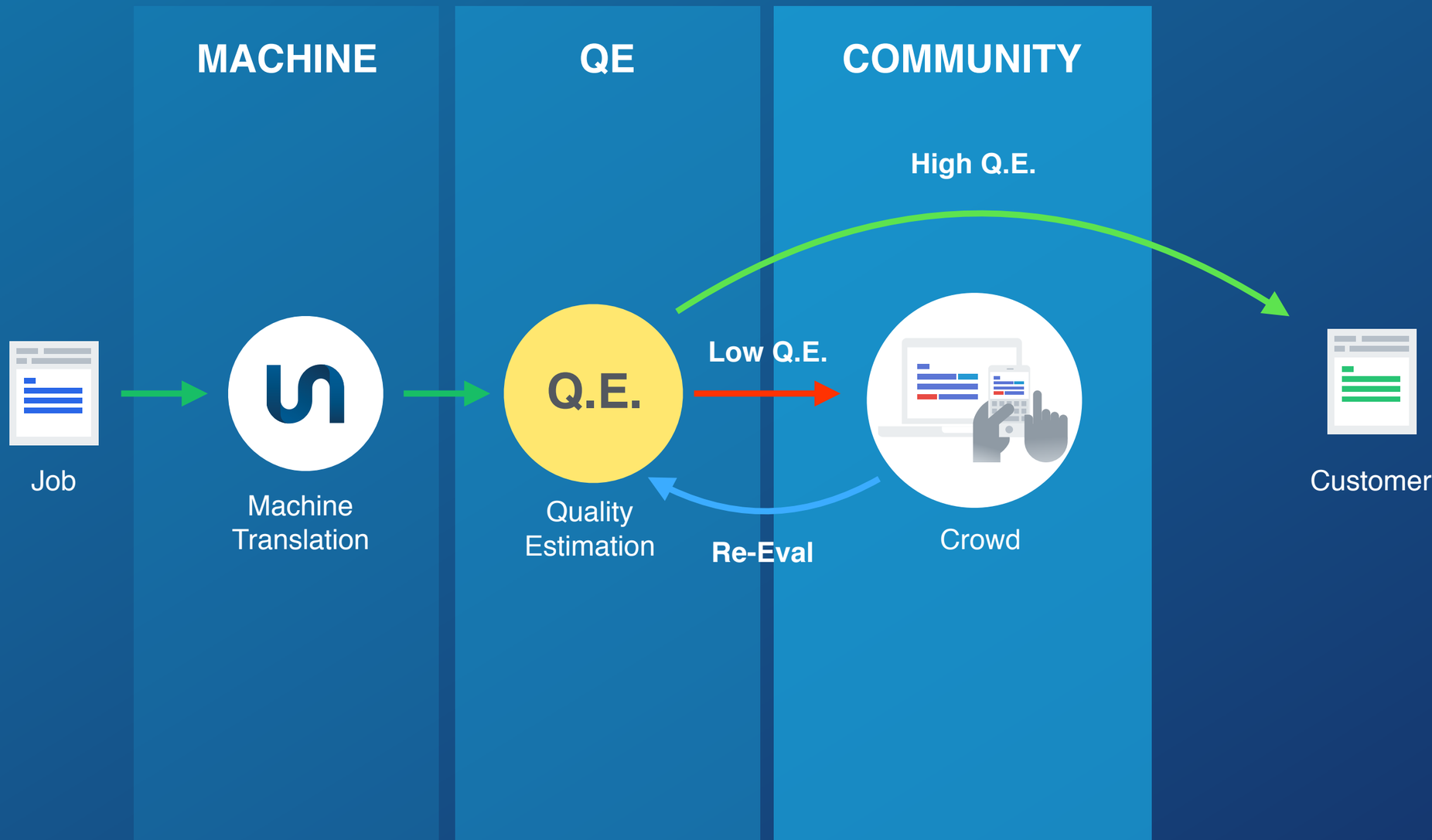
“Espero que esto es útil”

- Deleted word “es”
- Inserted word “sea”

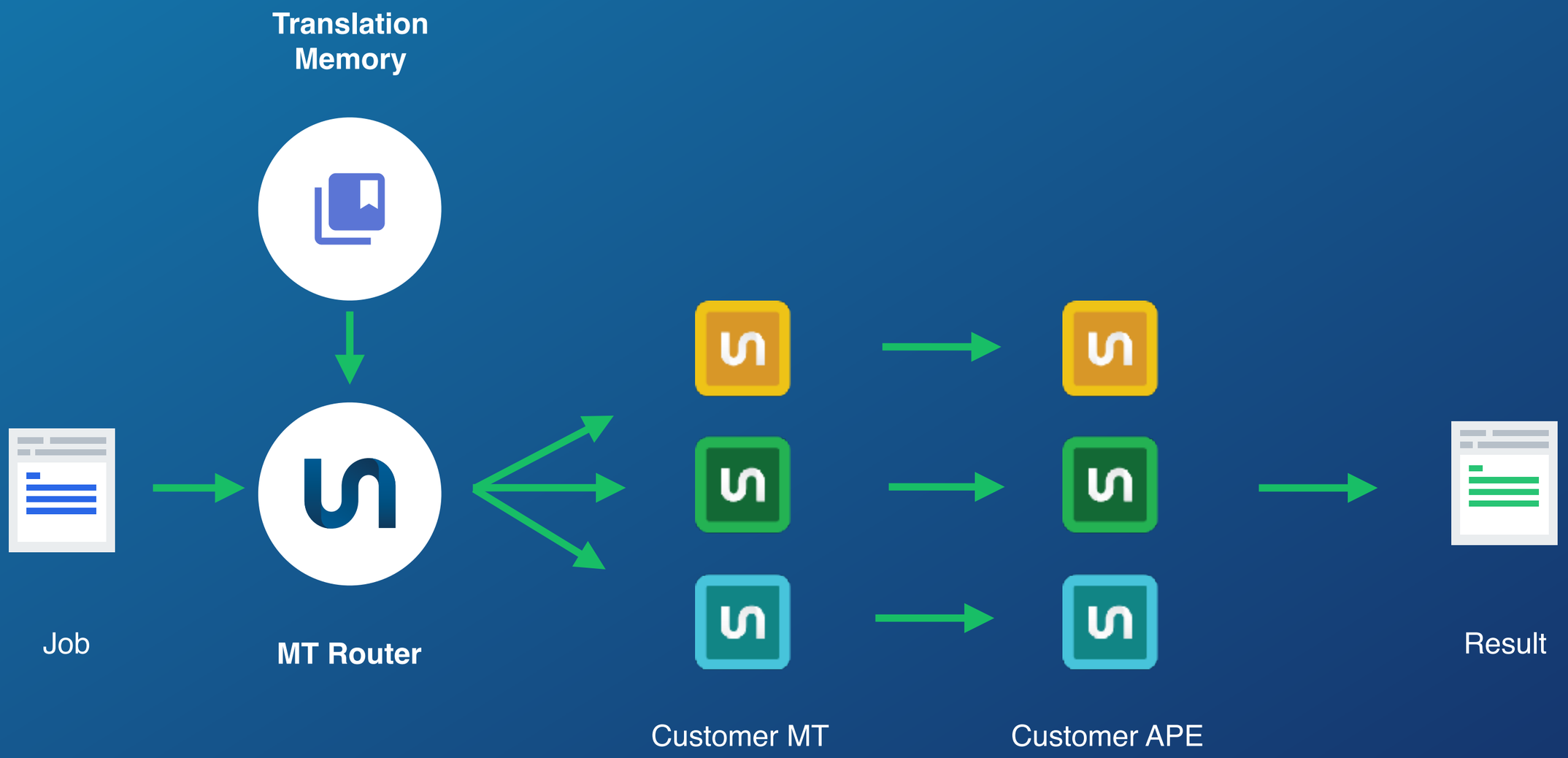
Submitted text

“Espero que esto sea útil”

Unbabel Pipeline

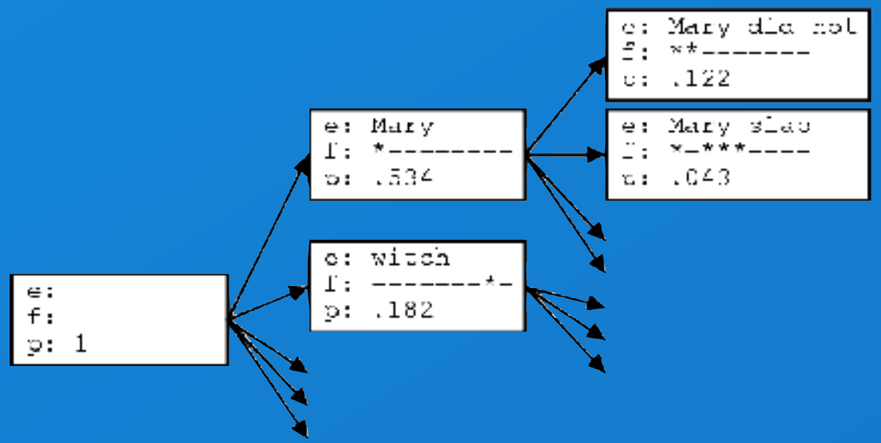


Machine Translation Pipeline

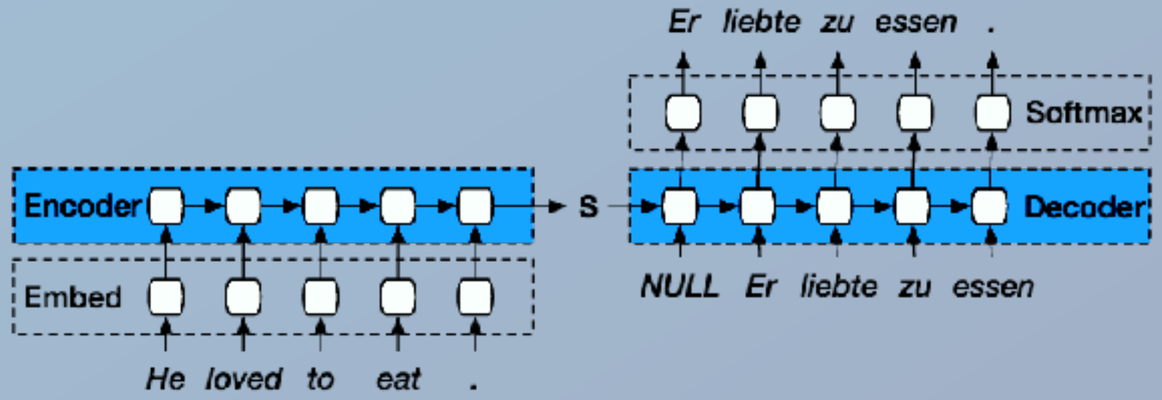


Machine Translation Models

Phrase-based MT

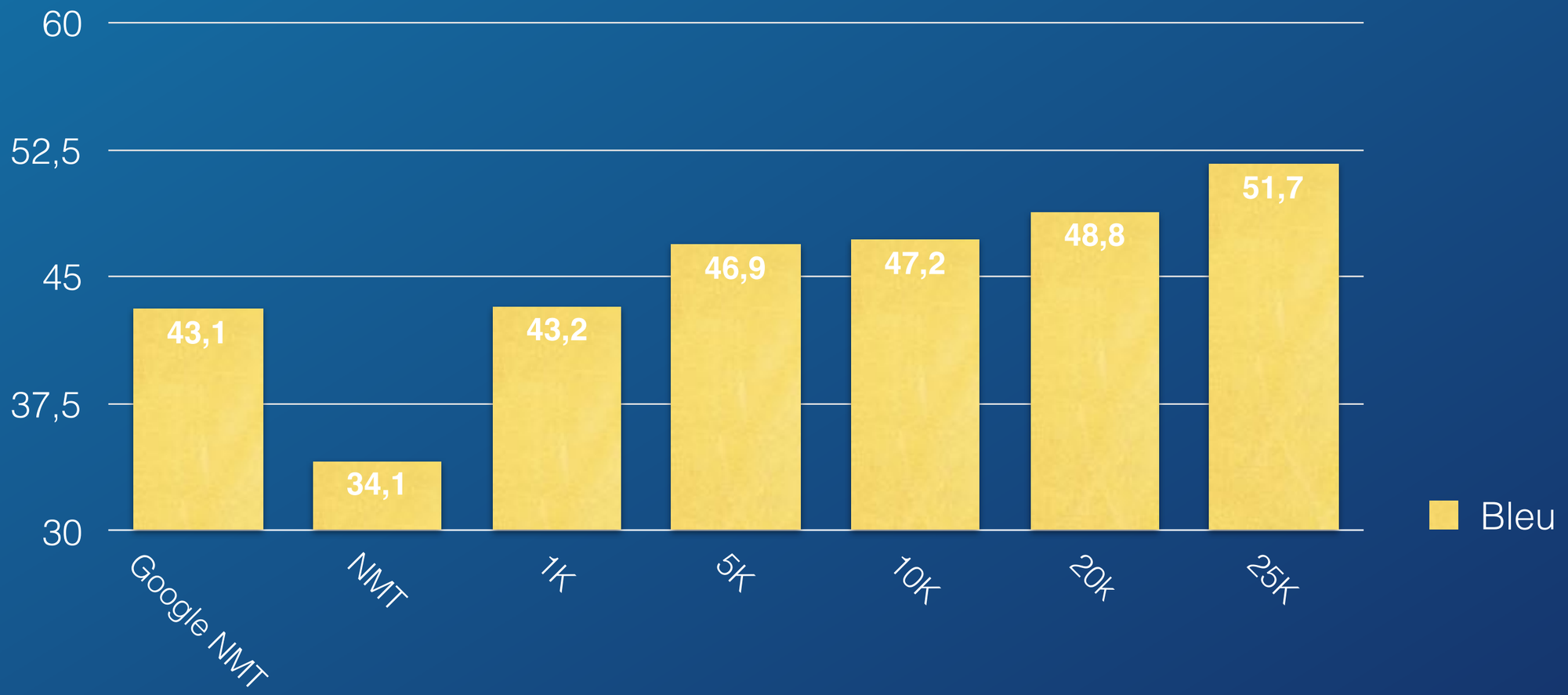


Neural MT



Customer Adaptation

Customer Support Tickets



Quality Estimation

Word-Level QE

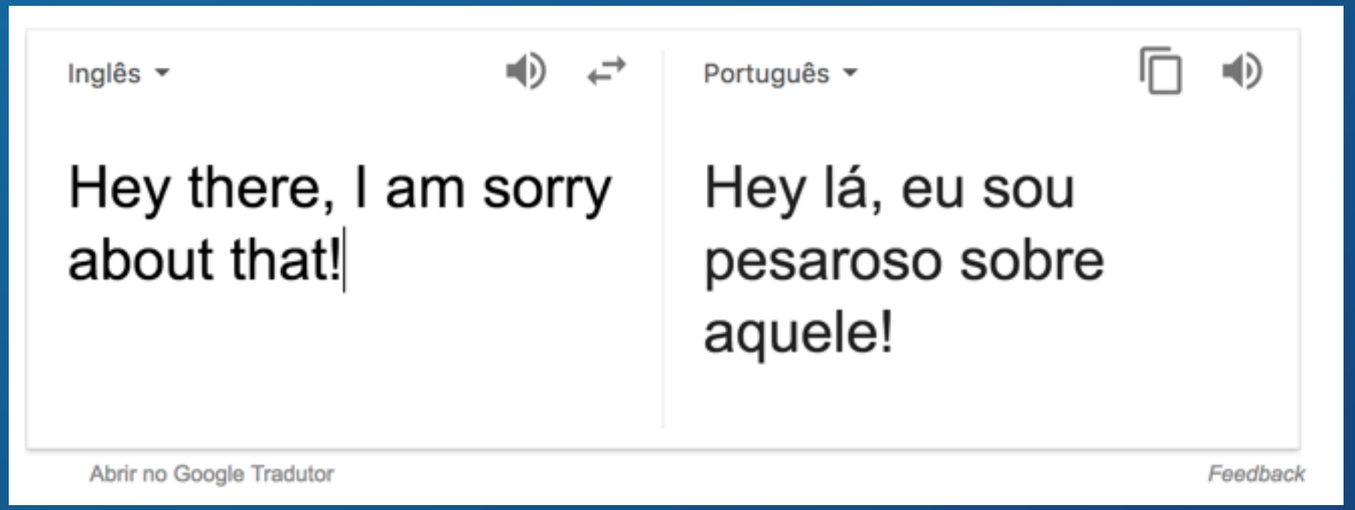
Which words are translated correctly/incorrectly?

Sentence-Level QE

How good is the entire translation?

Quality Estimation

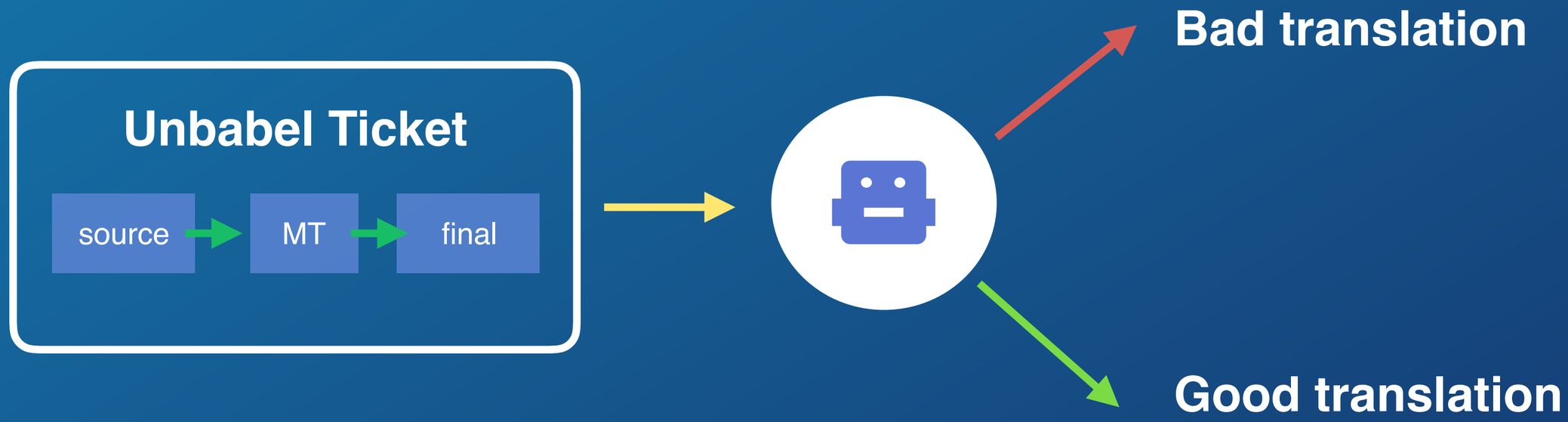
Word-level QE example



Hey lá , eu sou pesaroso sobre aquele !

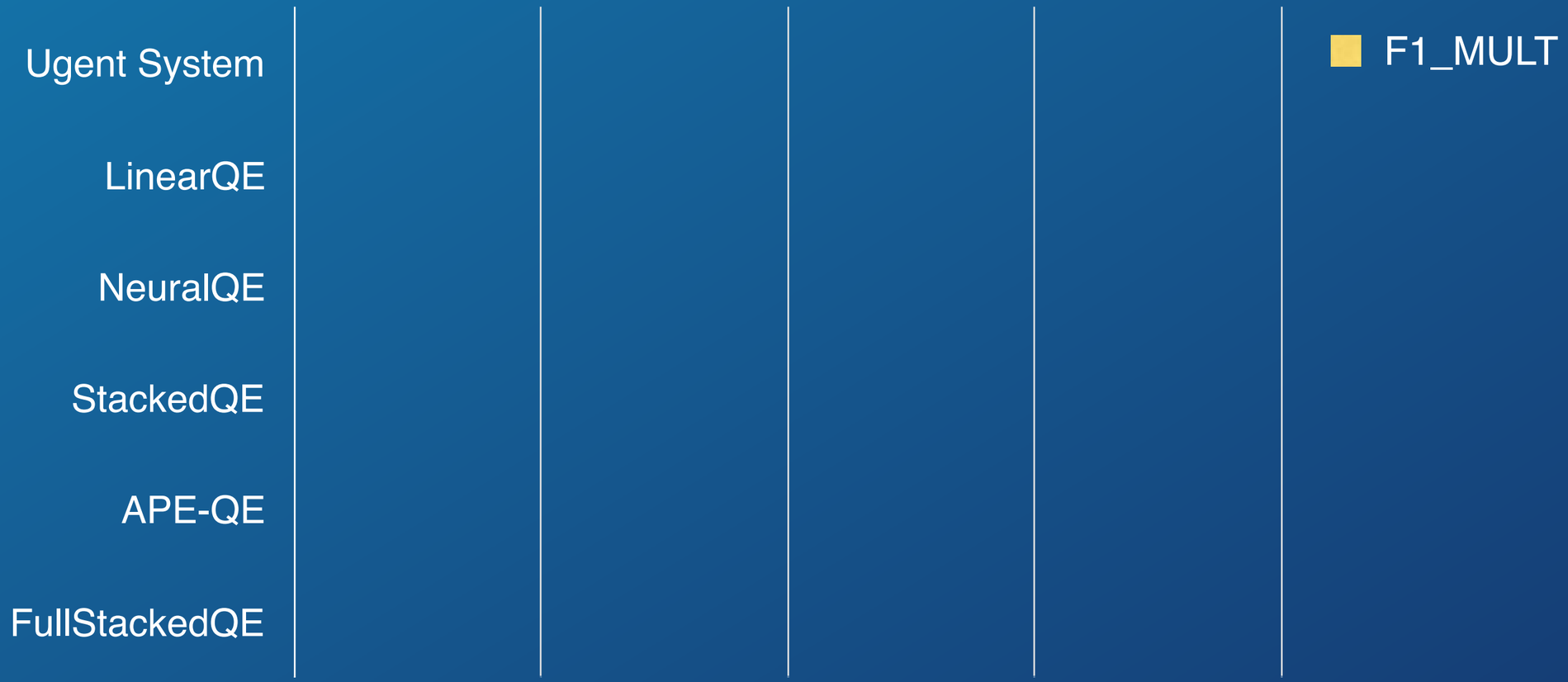
BAD BAD OK BAD BAD BAD OK OK OK

QE Training

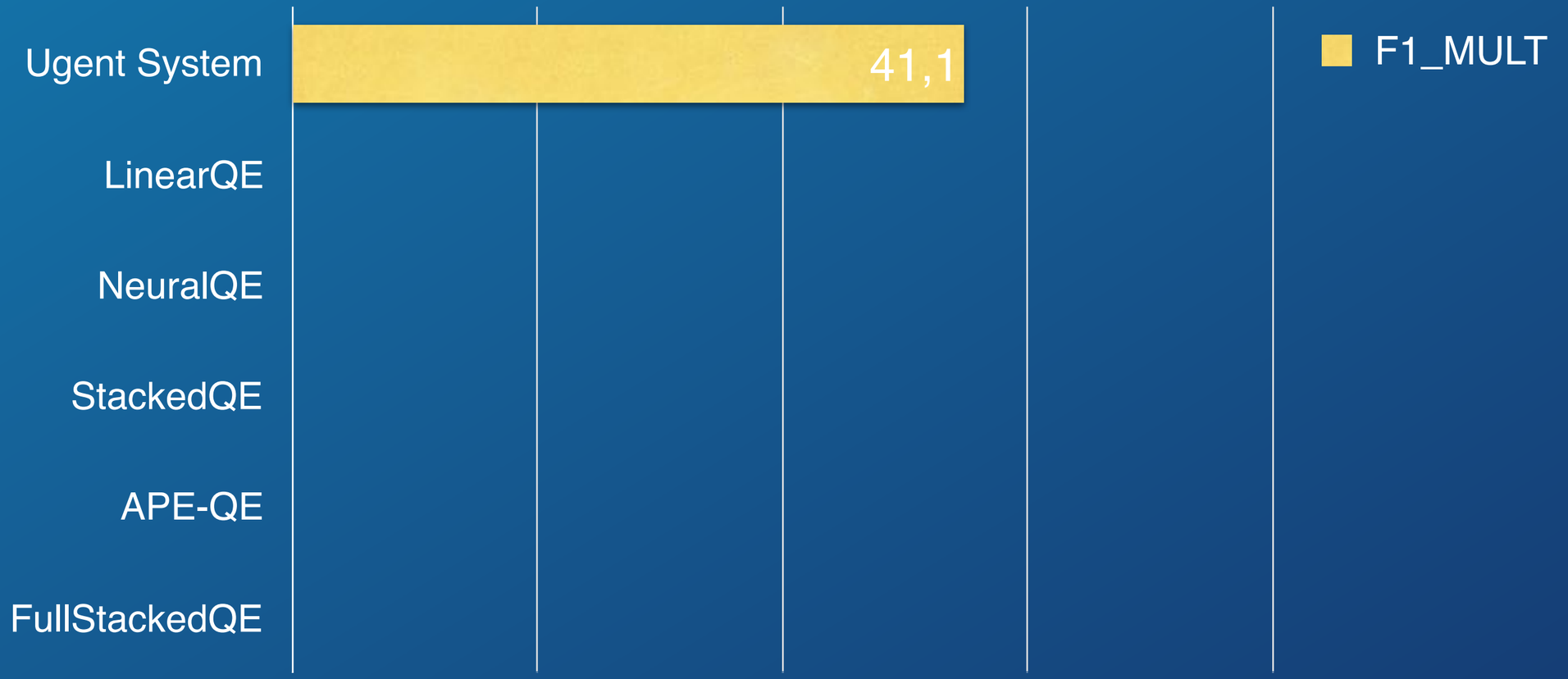

Unbabel Ticket
source
MT
final
Bad translation
Good translation

QE Word Level

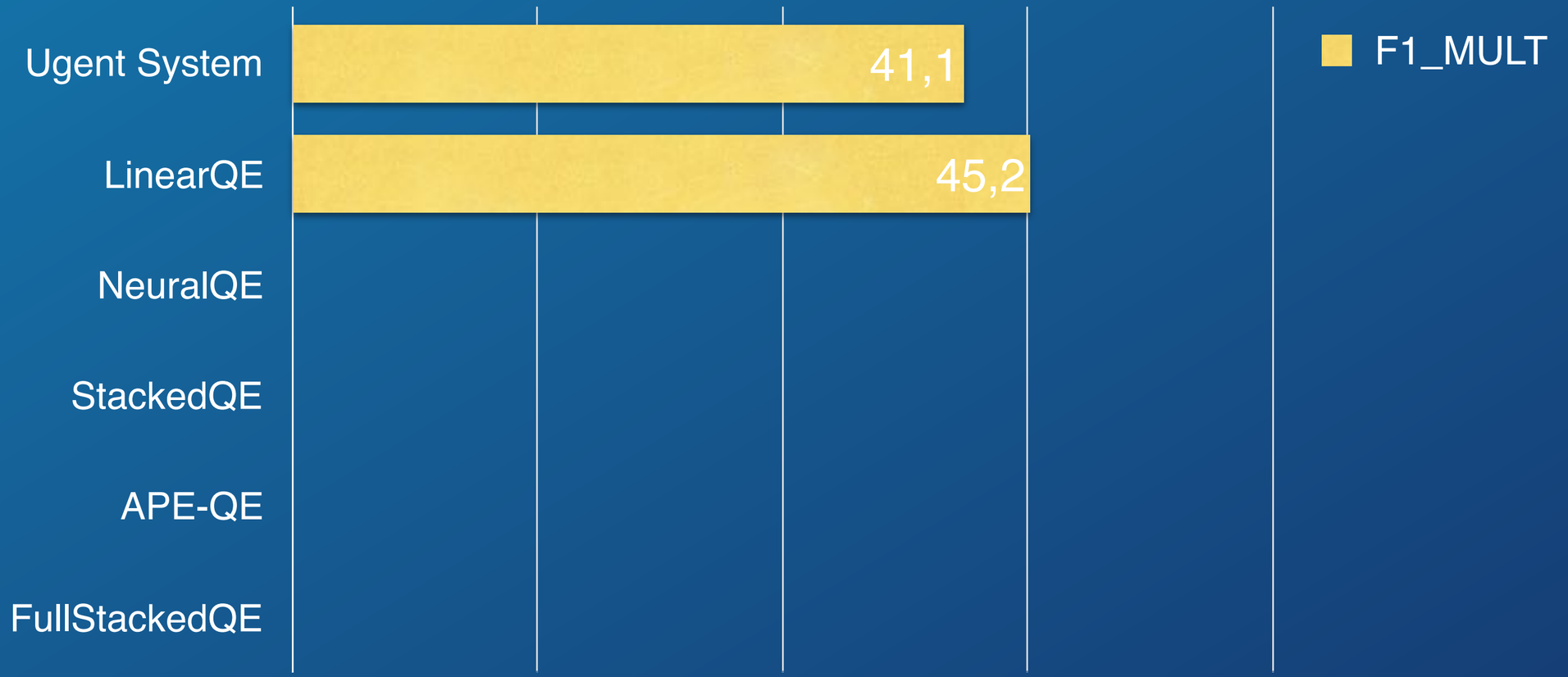
QE Word Level



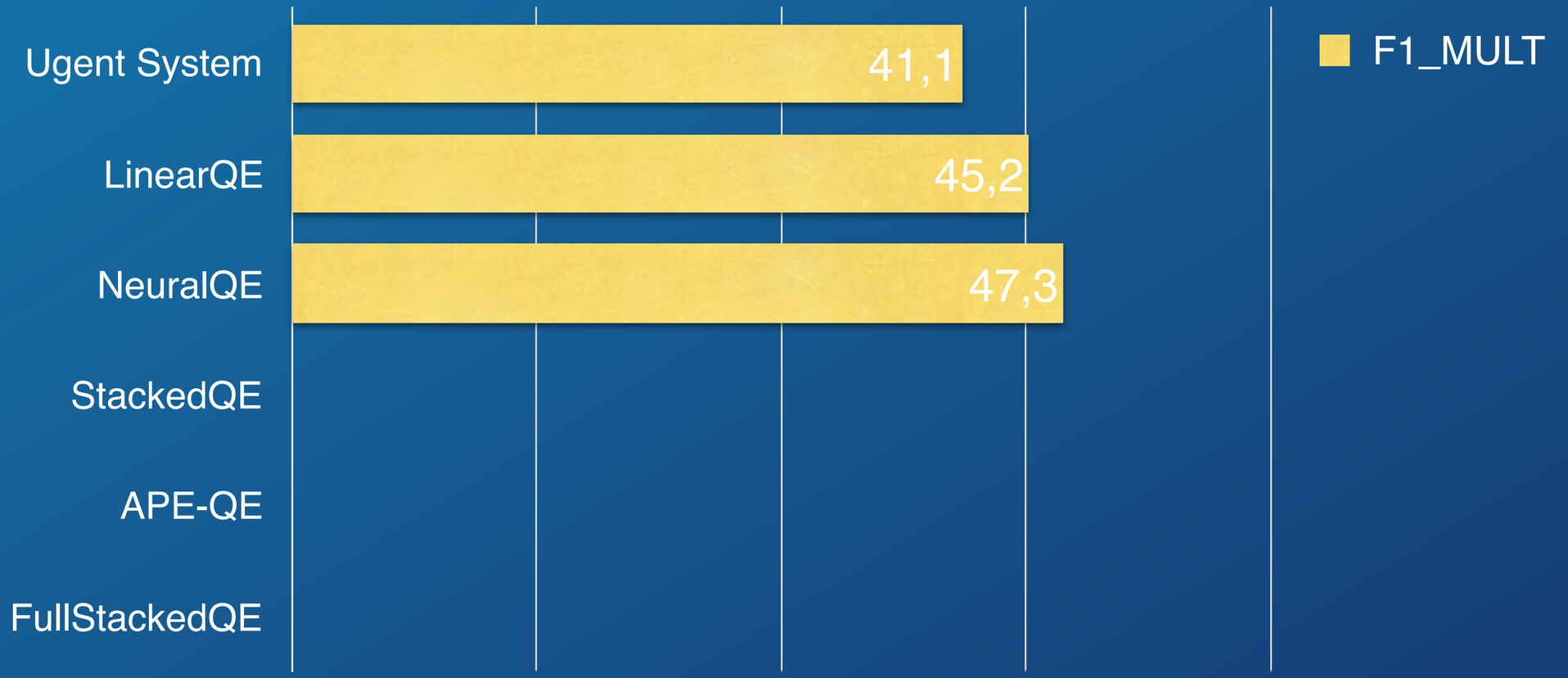
QE Word Level



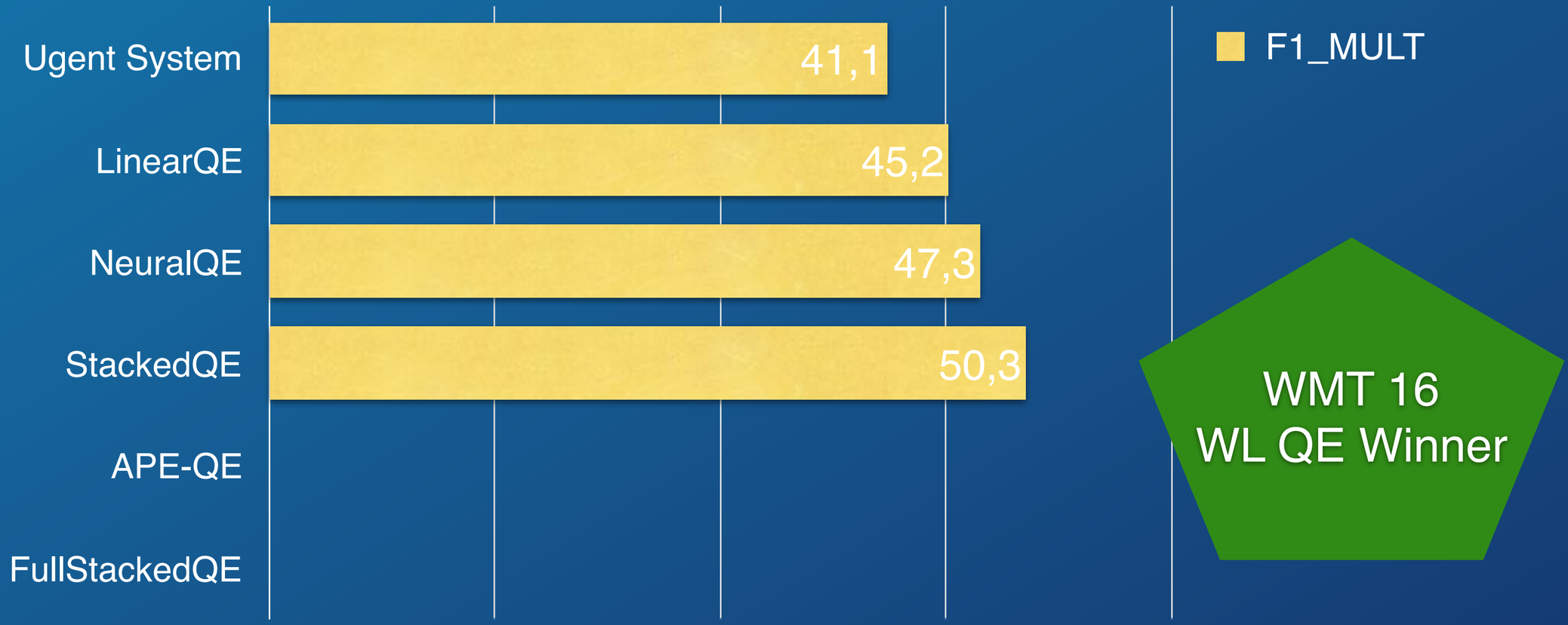
QE Word Level



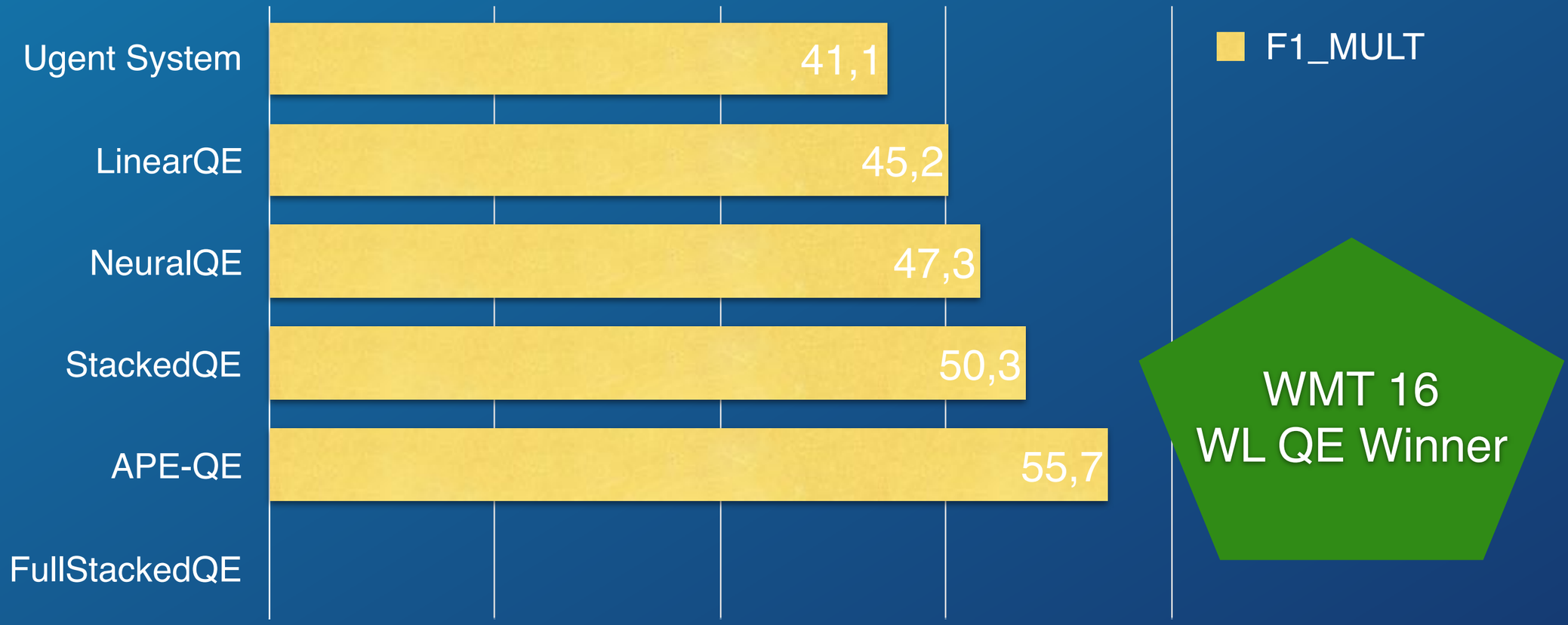
QE Word Level



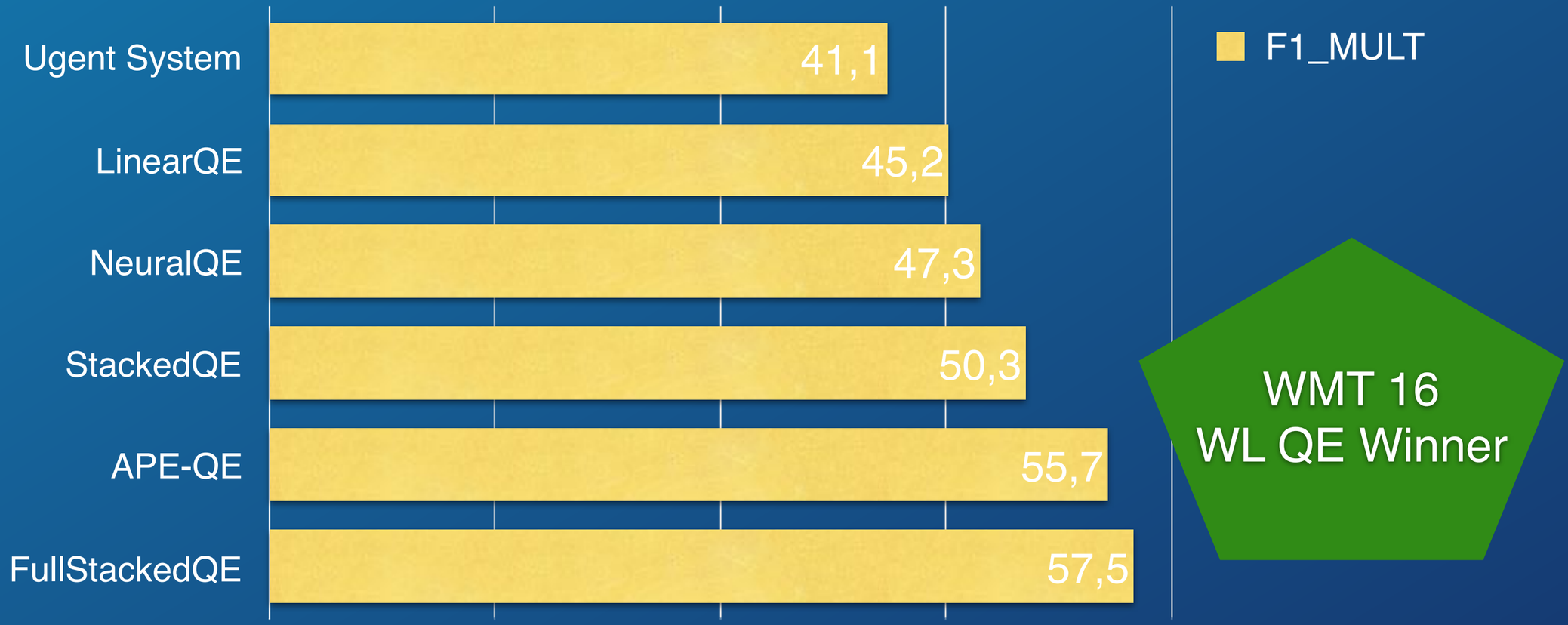
QE Word Level



QE Word Level



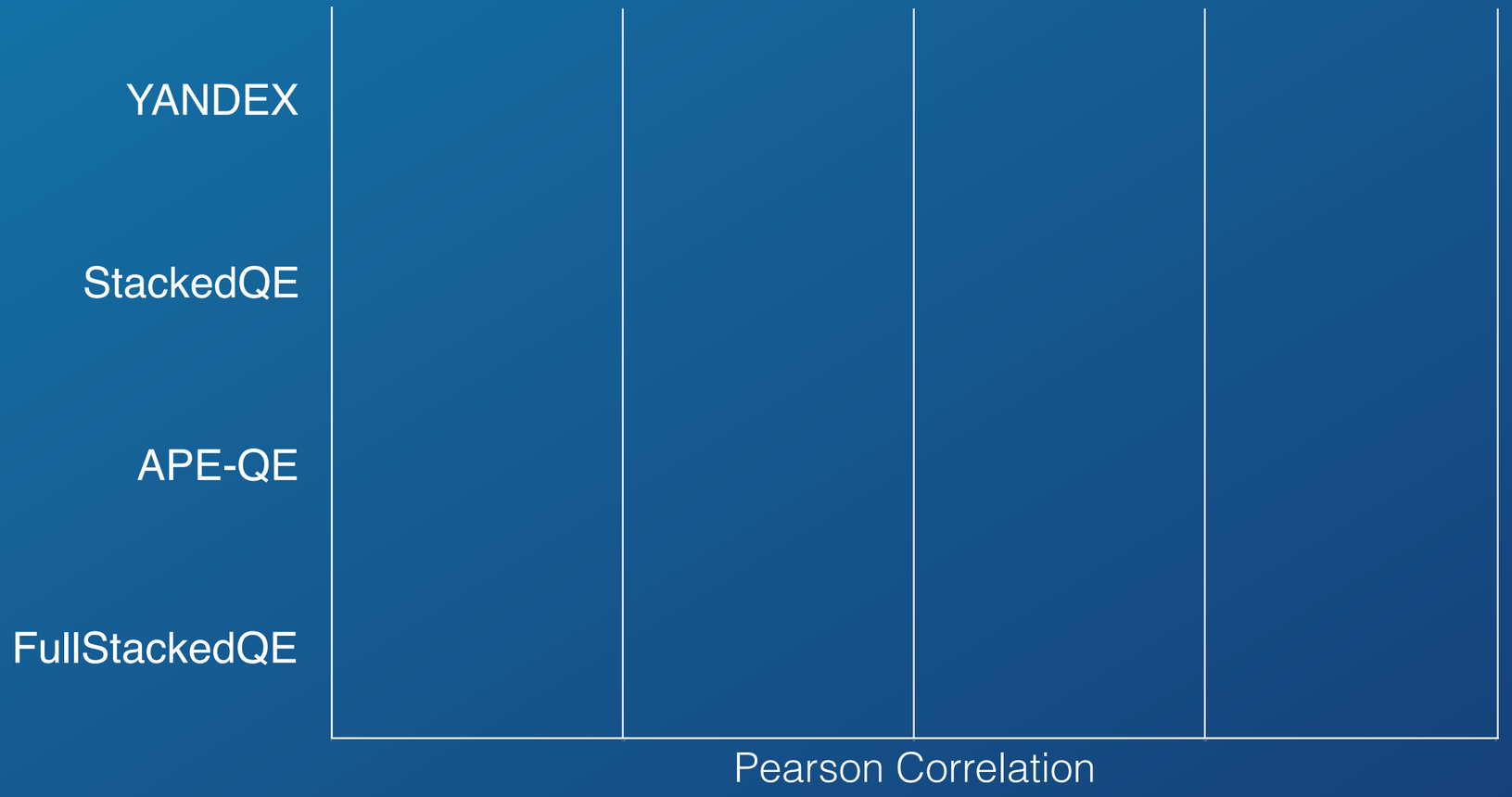
QE Word Level



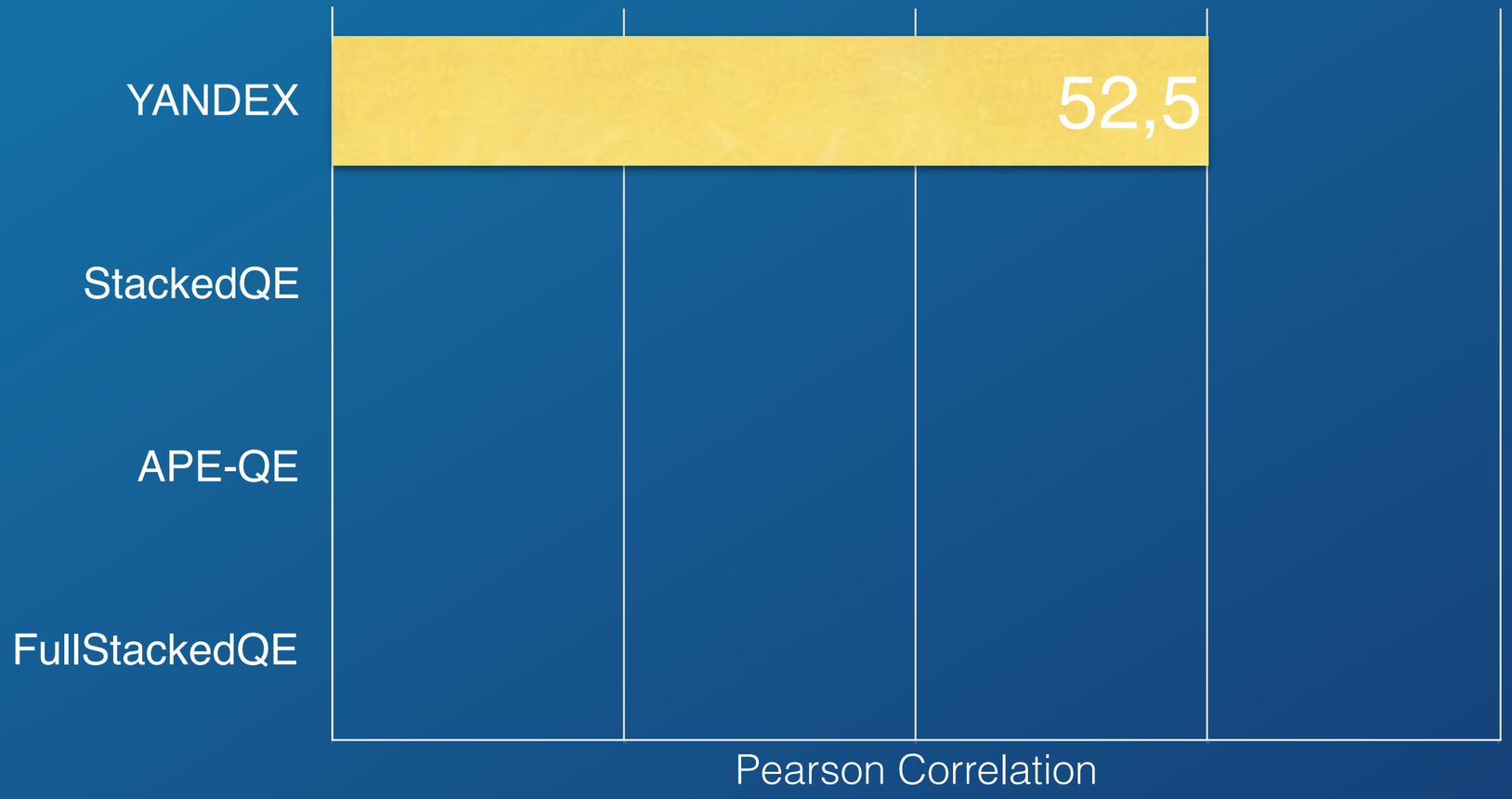
Andre F. T. Martins, Marcin Junczys-Dowmunt, Fabio Kepler, Ramon Astudillo, Chris Hokamp, Roman Grundkiewicz.
“Pushing the Limits of Translation Quality Estimation.” TACL 2017 (To Appear)

QE Sentence Level

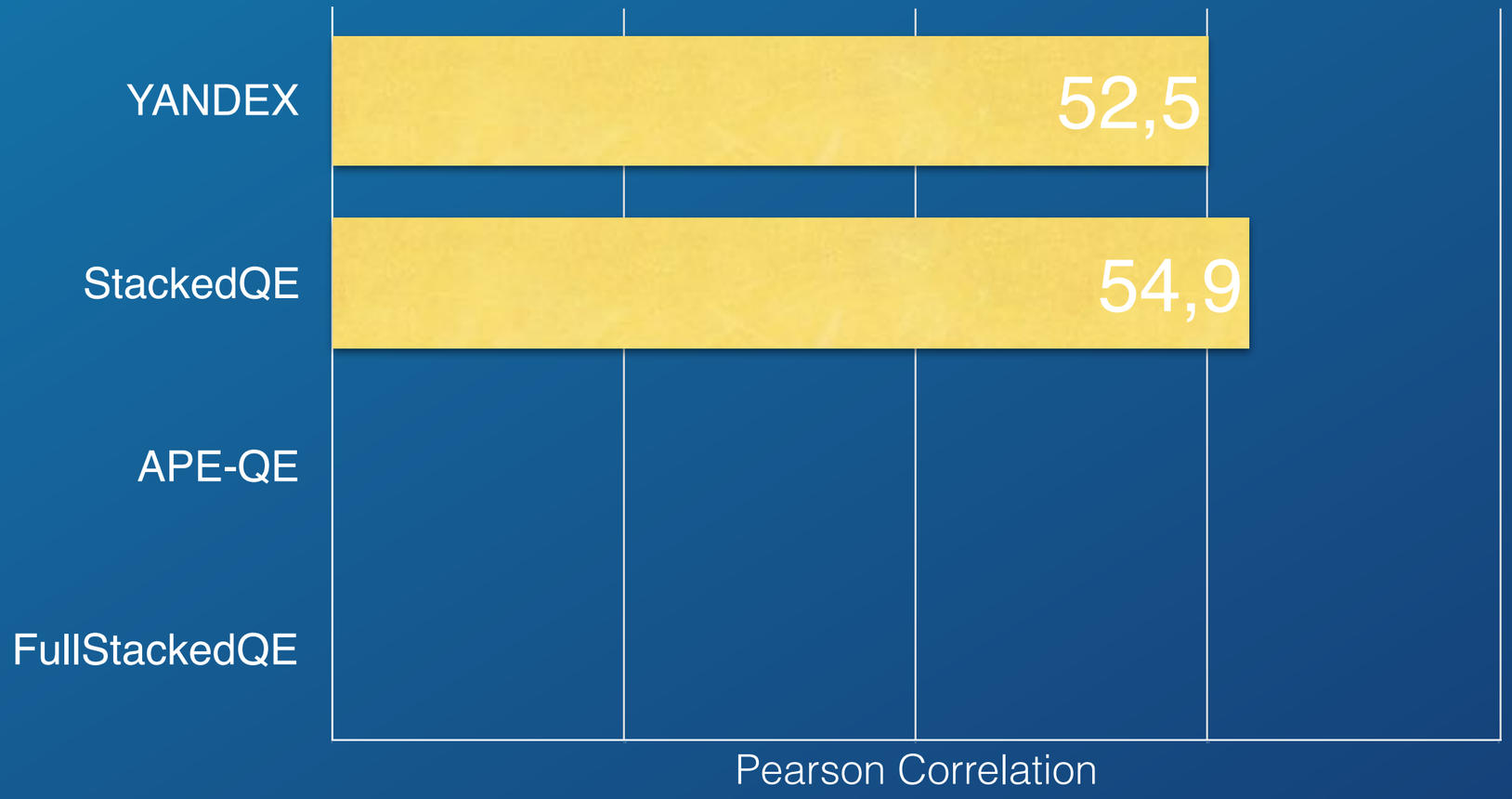
QE Sentence Level



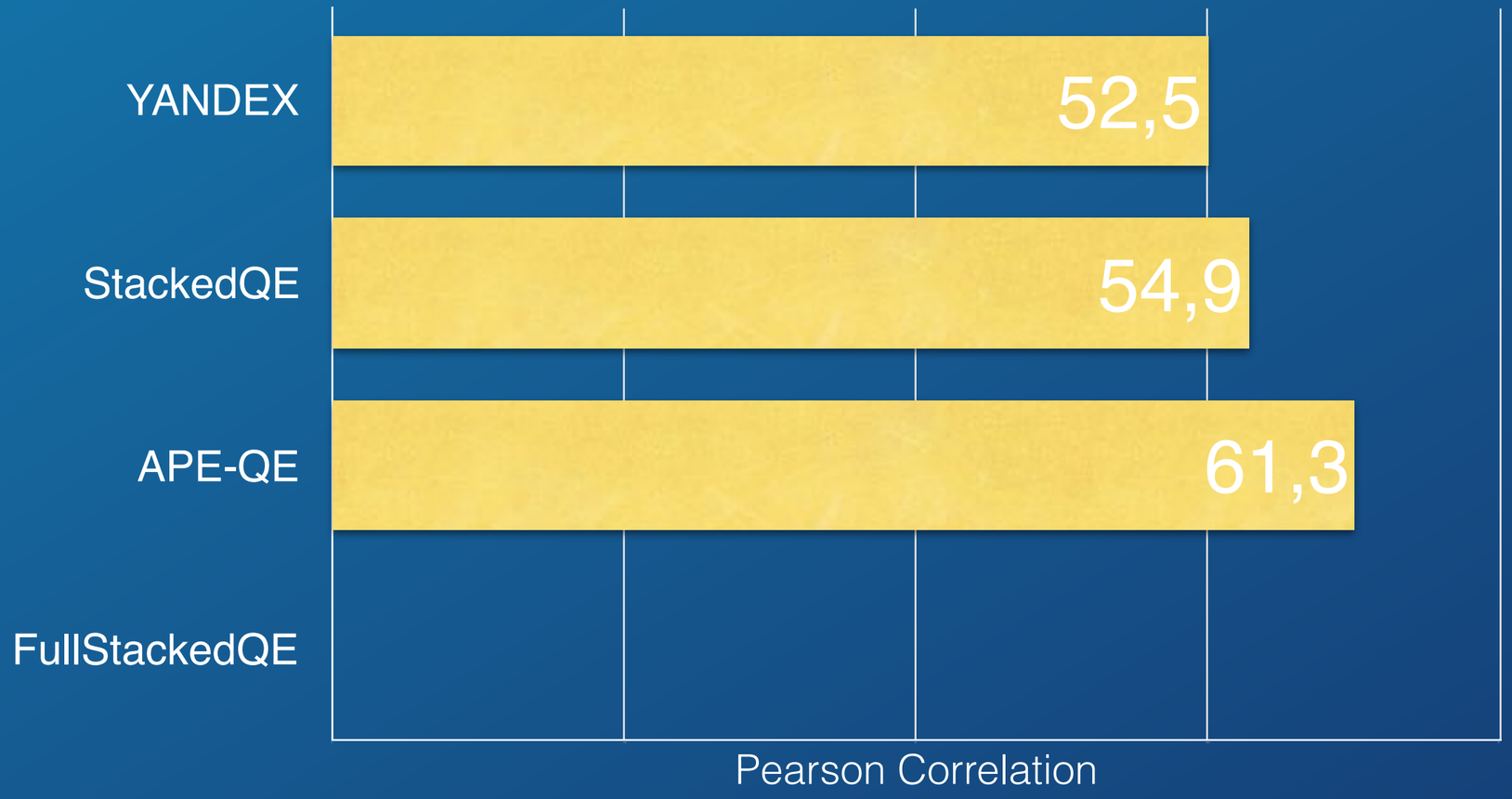
QE Sentence Level



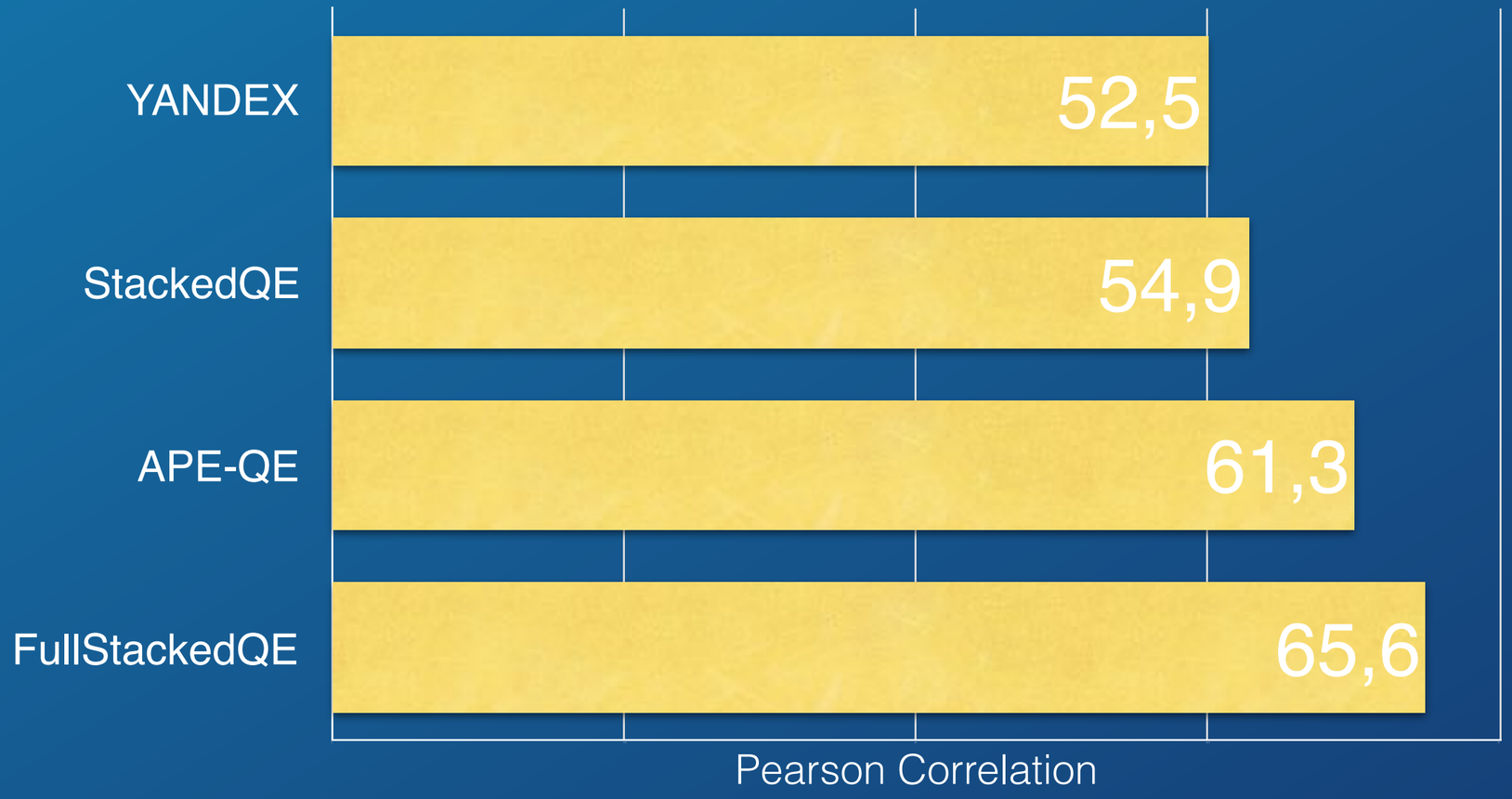
QE Sentence Level



QE Sentence Level



QE Sentence Level



Andre F. T. Martins, Marcin Junczys-Dowmunt, Fabio Kepler, Ramon Astudillo, Chris Hokamp, Roman Grundkiewicz. “Pushing the Limits of Translation Quality Estimation.” TACL 2017 (To Appear)

QE in the Pipeline

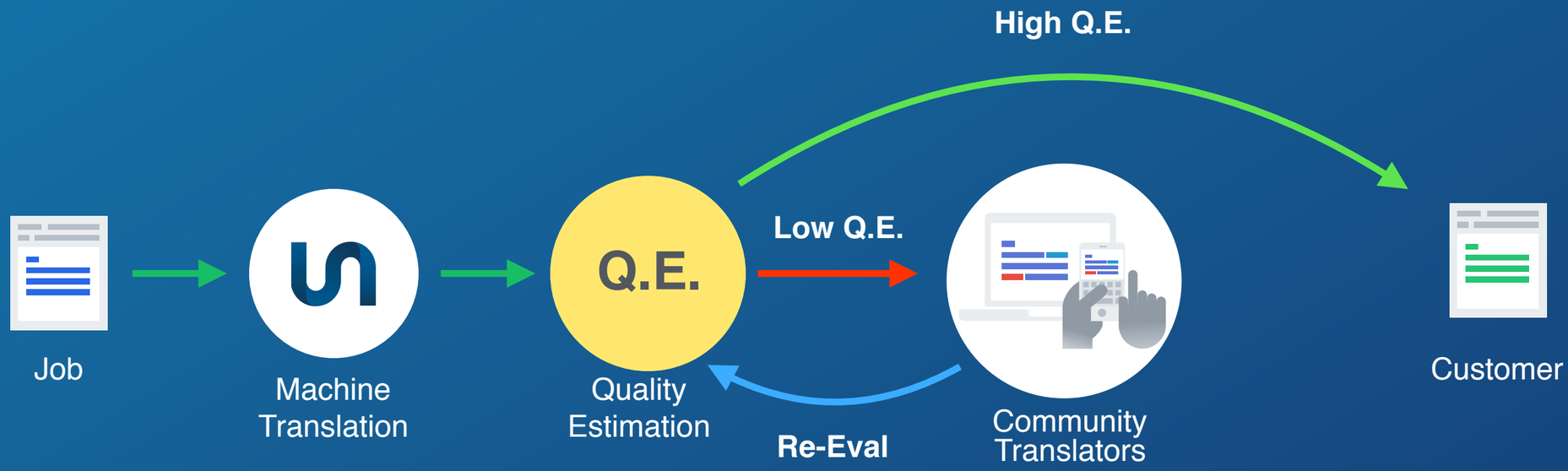
QE in the Pipeline

QE in the Pipeline

Document-Level QE

how good is the entire document?

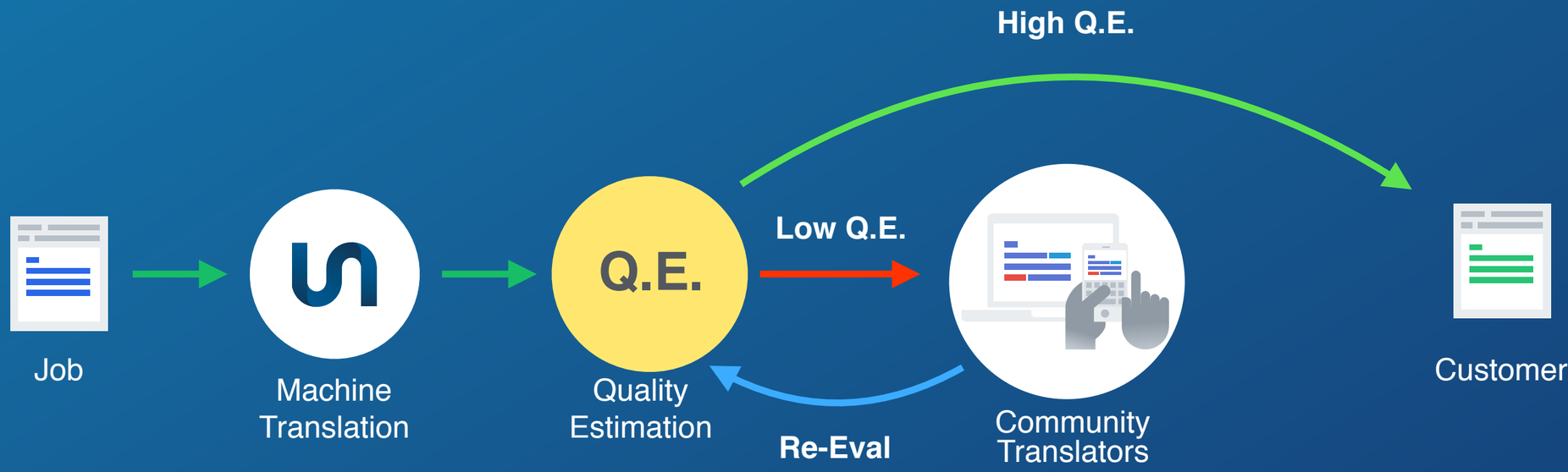
QE in the Pipeline



Document-Level QE

how good is the entire document?

QE in the Pipeline



Document-Level QE
how good is the entire document?

Human QE
Can we evaluate post-edit output?

Interesting numbers coming soon

Professional Translation

Goals

- Quality
- Speed
- Cost

Professional Translation

Goals

- Quality
- Speed
- Cost

Pillars

Professional Translation

Goals

- Quality
- Speed
- Cost

Pillars

Professional Translation

Goals

- Quality
- Speed
- Cost

Pillars

- Editors Pool

Professional Translation

Goals

- Quality
- Speed
- Cost

Pillars

- Editors Pool
- Initial Text (MT)

Professional Translation

Goals

- Quality
- Speed
- Cost

Pillars

- Editors Pool
- Initial Text (MT)
- Editor Assignment

Professional Translation

Goals

- Quality
- Speed
- Cost

Pillars

- Editors Pool
- Initial Text (MT)
- Editor Assignment
- Interfaces

Professional Translation

Goals

- Quality
- Speed
- Cost

Pillars

- Editors Pool
- Initial Text (MT)
- Editor Assignment
- Interfaces
- Quality Evaluation

Unbabel Community

Unbabel Community

50 000 Users

Distributed Pipeline

Editors Pool

Specialisation layers will grow with time

The best editors have access to paid content

Editors get ratings for the tasks

Editors are tested when they sign up

Editors Pool

Specialisation layers will grow with time

The best editors have access to paid content

Editors get ratings for the tasks

Editors are tested when they sign up

Evaluators

Editors Pool

Specialisation layers will grow with time

The best editors have access to paid content

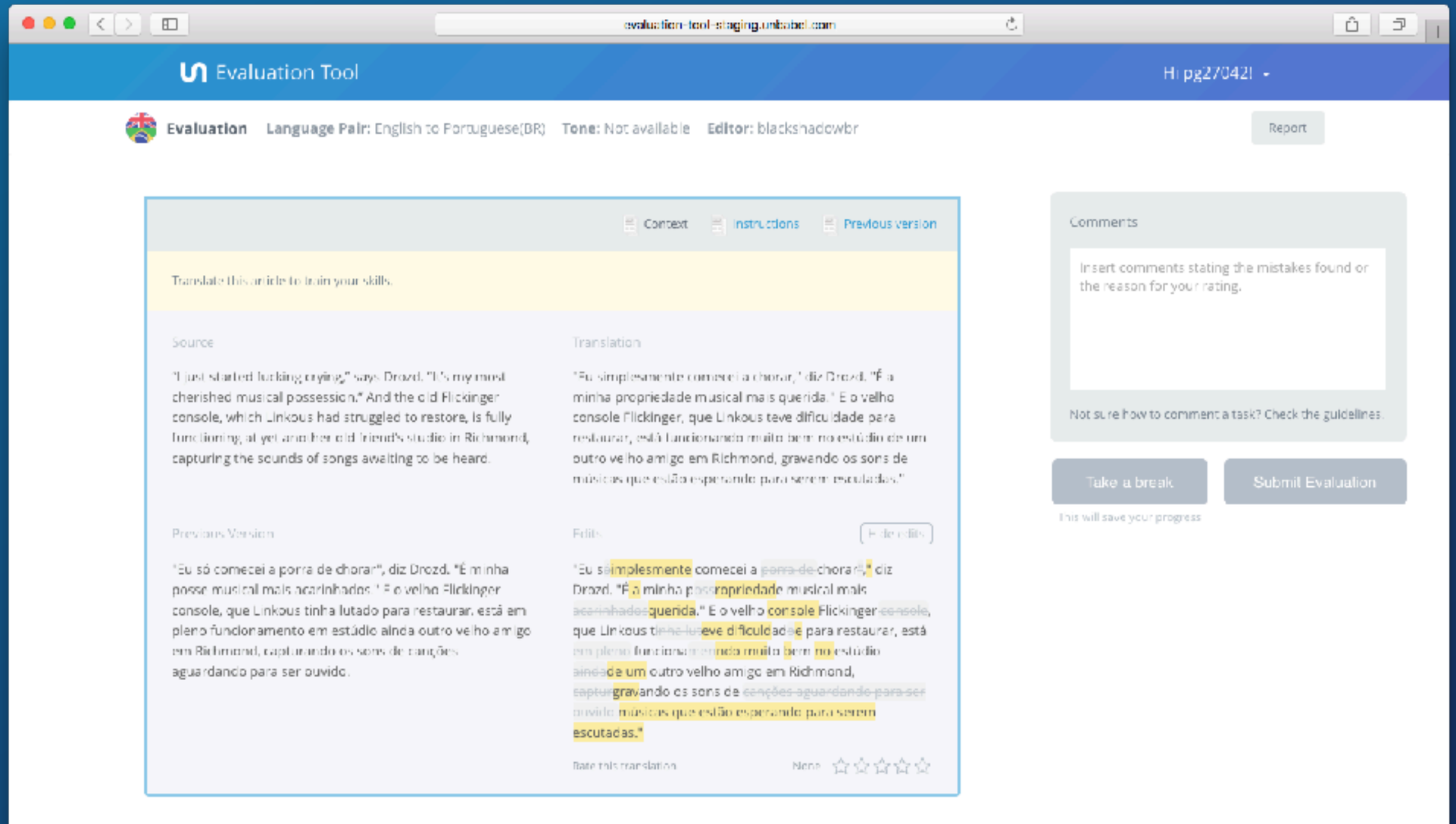
Editors get ratings for the tasks

Editors are tested when they sign up

Evaluators

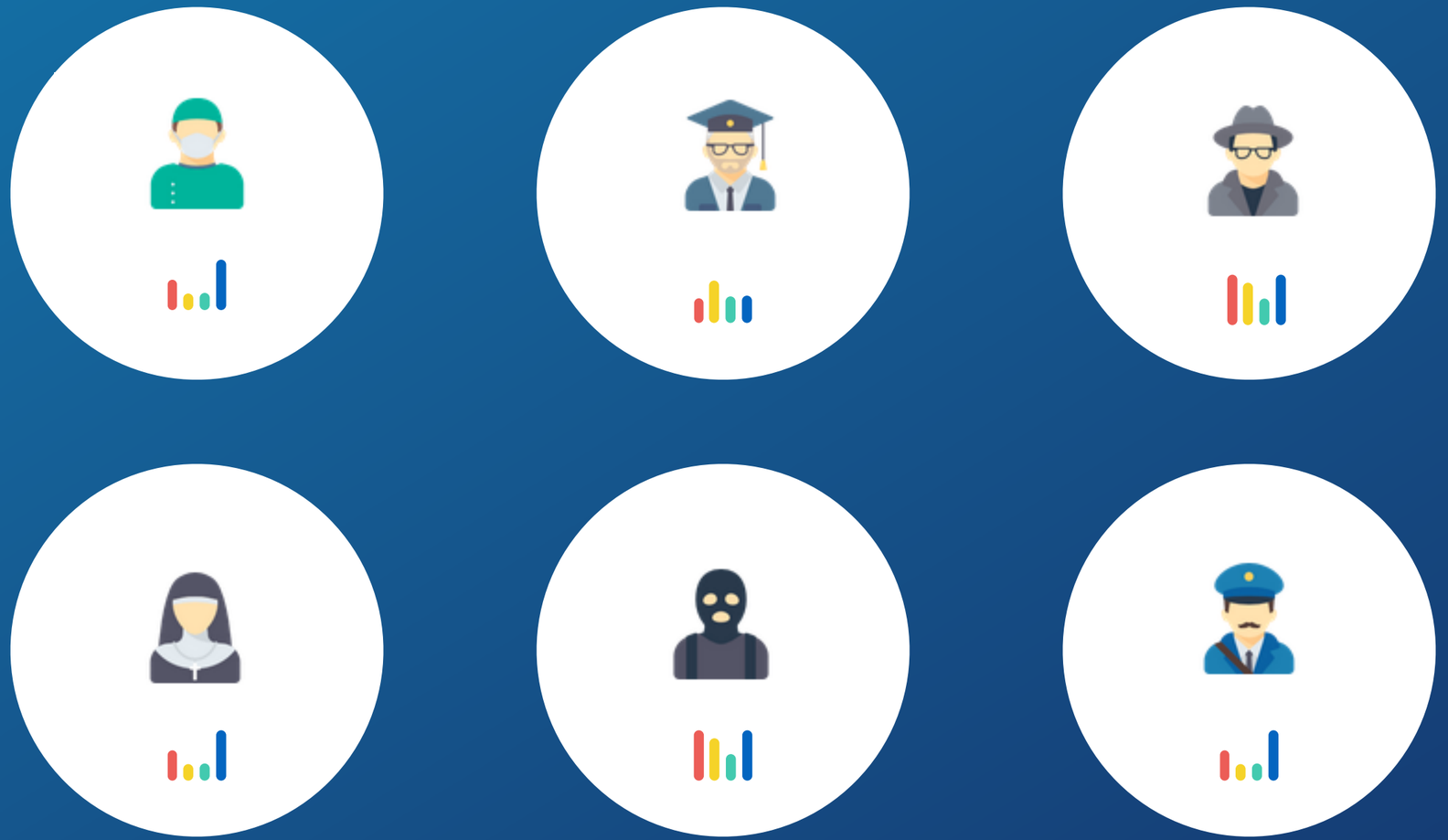
Annotators

How Editors are Evaluated



Editors Profiling

Editors Profiling



Editor Assignment

Editor Assignment

Tasks/time

2 m

6 m

10 m

12 m

18 m

45 m

Editor Assignment

Tasks/time

2 m

6 m

10 m

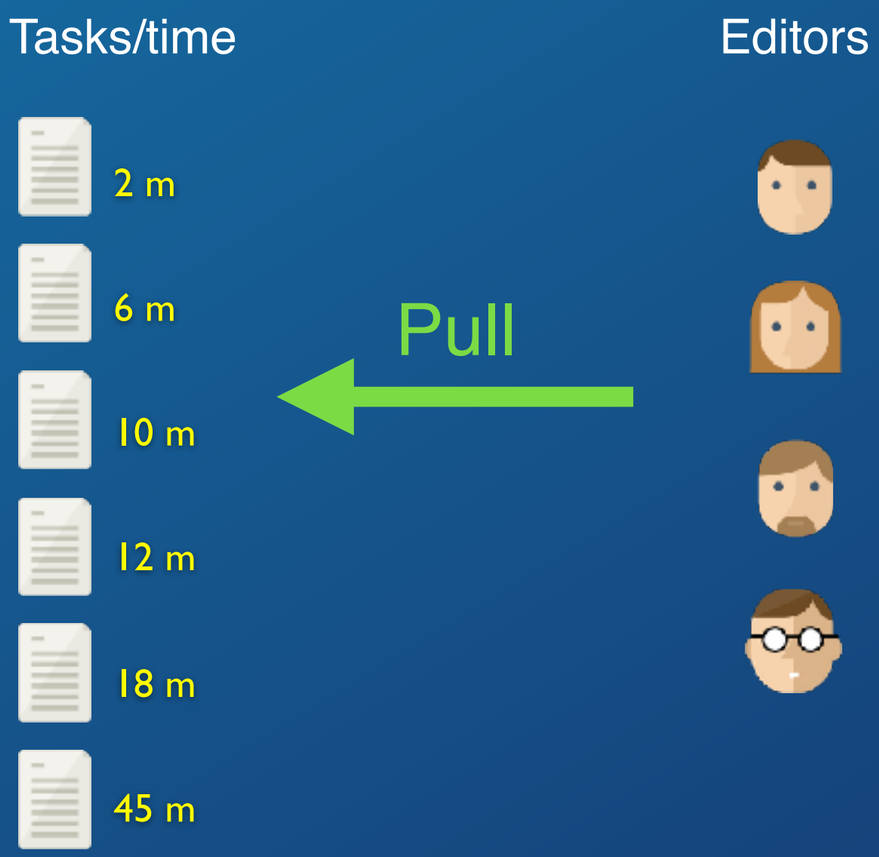
12 m

18 m

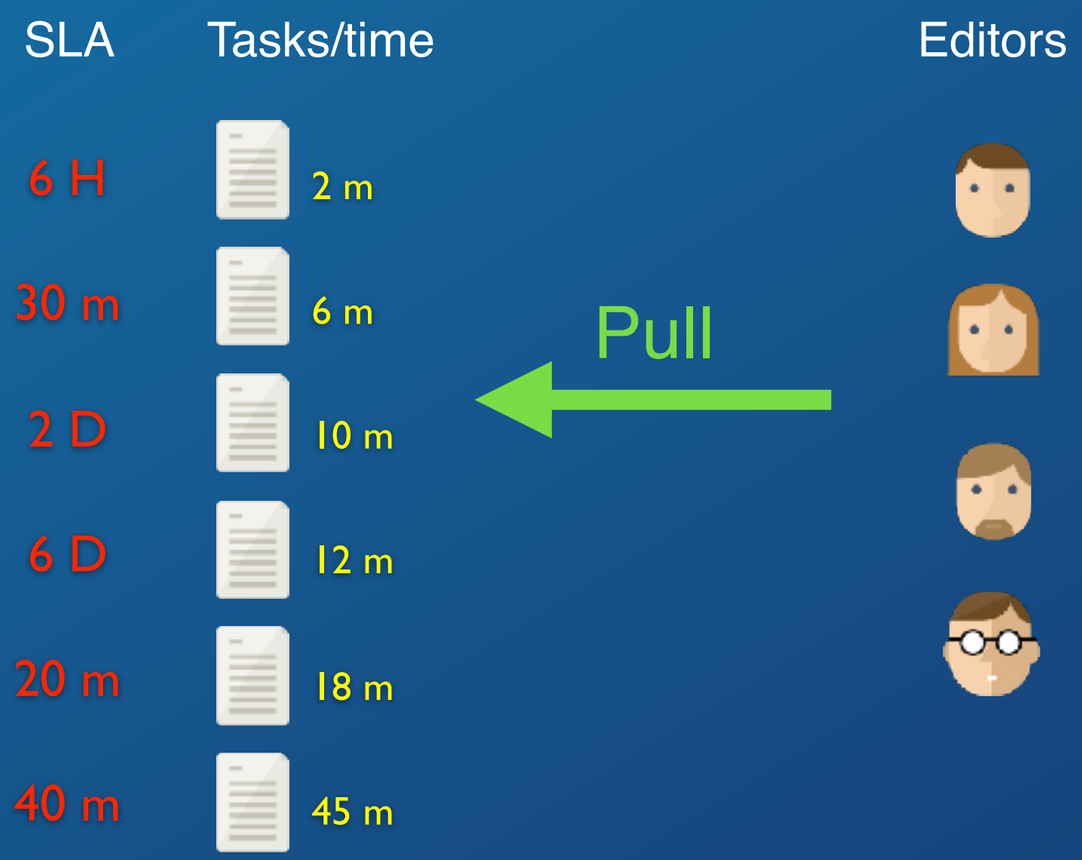
45 m

Editors

Editor Assignment



Editor Assignment



Editor Assignment

Priority	SLA	Tasks/time
1000	6 H	2 m
1100	30 m	6 m
1000	2 D	10 m
1000	6 D	12 m
1100	20 m	18 m
1100	40 m	45 m

Pull

Editors

Editor Assignment

Queue	Priority	SLA	Tasks/time
G	1000	6 H	2 m
G	1100	30 m	6 m
G	1000	2 D	10 m
G	1000	6 D	12 m
R	1100	20 m	18 m
R	1100	40 m	45 m

Pull

Editors

Editor Assignment

Queue	Priority	SLA	Tasks/time
G	1000	6 H	2 m
G	1100	30 m	6 m
G	1000	2 D	10 m
G	1000	6 D	12 m
R	1100	20 m	18 m
R	1100	40 m	45 m

Pull

Editors	Rating
	4.2
	3.8
	4.3
	4.8

Editor Assignment

Queue	Priority	SLA	Tasks/time
G	1000	6 H	2 m
G	1100	30 m	6 m
G	1000	2 D	10 m
G	1000	6 D	12 m
R	1100	20 m	18 m
R	1100	40 m	45 m

Pull

Editors	Rating	Native
	4.2	
	3.8	
	4.3	
	4.8	

Editor Assignment

Queue	Topics	Priority	SLA	Tasks/time
G		1000	6 H	2 m
G		1100	30 m	6 m
G		1000	2 D	10 m
G		1000	6 D	12 m
R		1100	20 m	18 m
R		1100	40 m	45 m

Pull

Editors	Rating	Native
	4.2	
	3.8	
	4.3	
	4.8	

Editor Assignment

Queue	Topics	Priority	SLA	Tasks/time
G		1000	6 H	2 m
G		1100	30 m	6 m
G		1000	2 D	10 m
G		1000	6 D	12 m
R		1100	20 m	18 m
R		1100	40 m	45 m

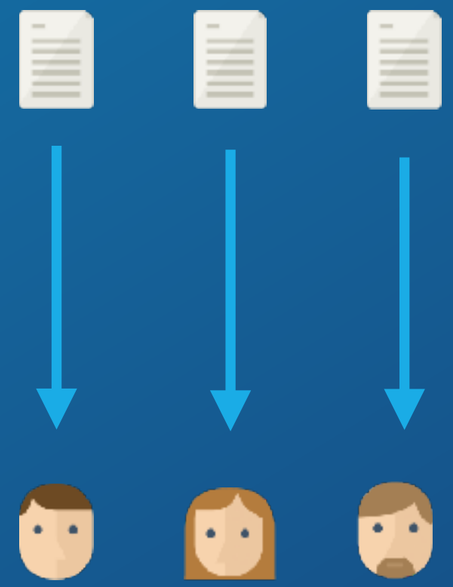
Pull

Editors	Rating	Native	Topics
	4.2		
	3.8		
	4.3		
	4.8		

Editor Assignment

Editor Assignment

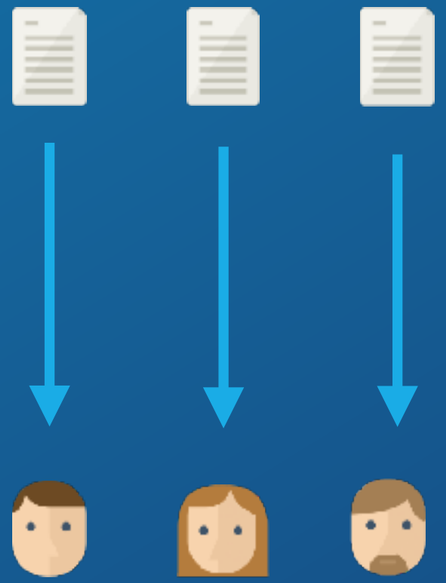
Regular distribution



old rating

Editor Assignment

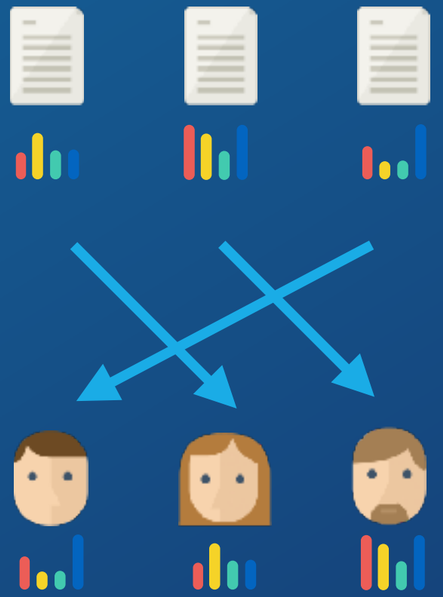
Regular distribution



3.8

old rating

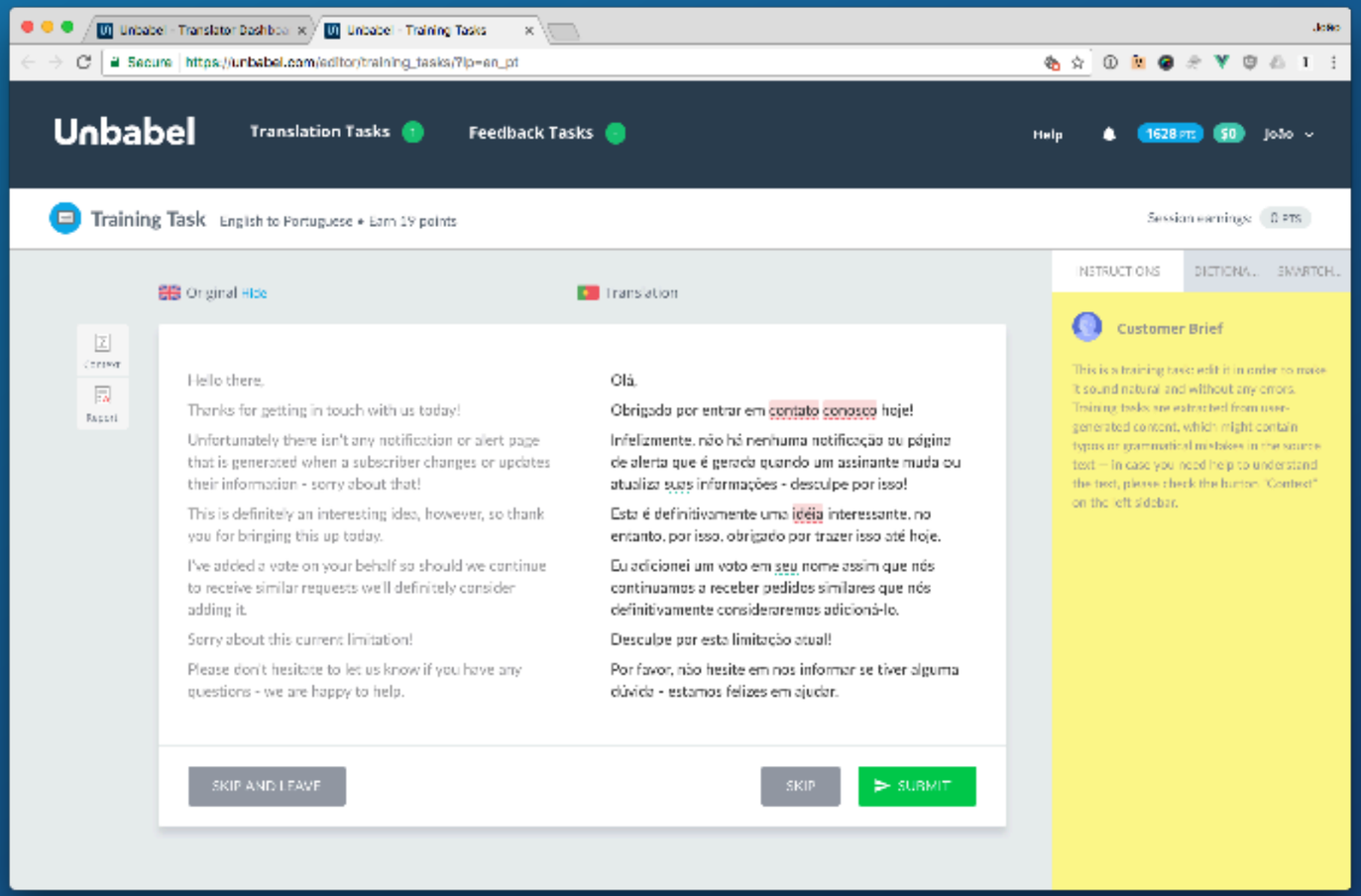
Smart distribution

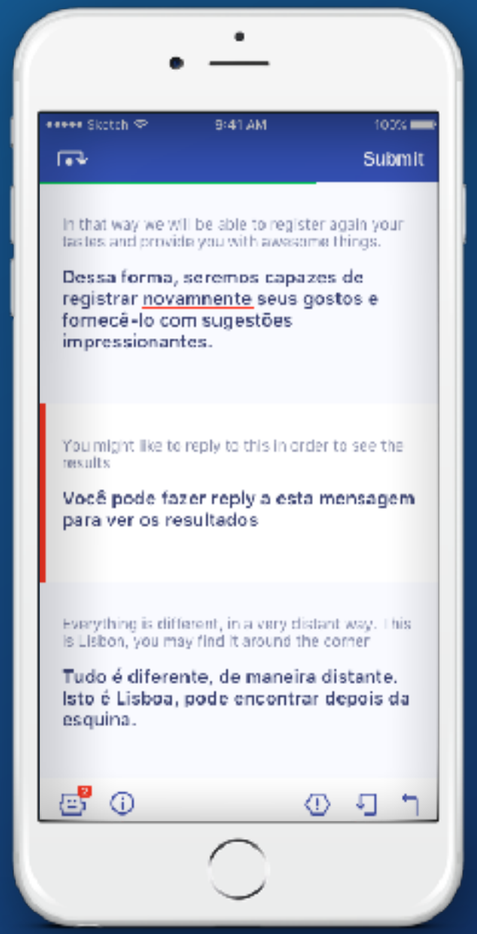


4.6

Improved rating

Post-Editing Interfaces

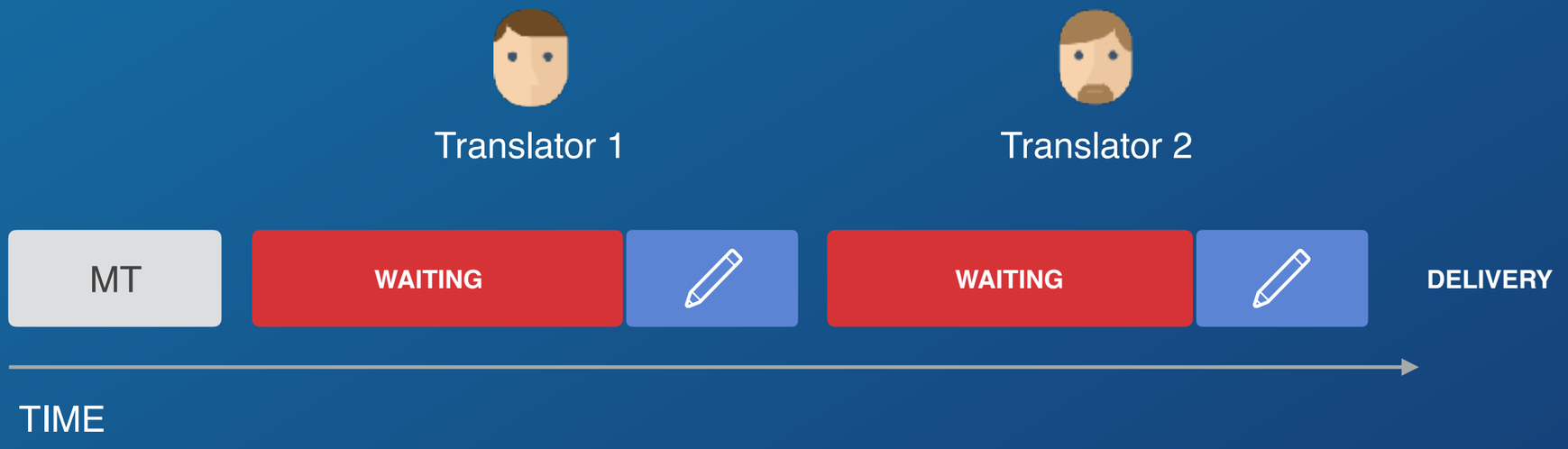




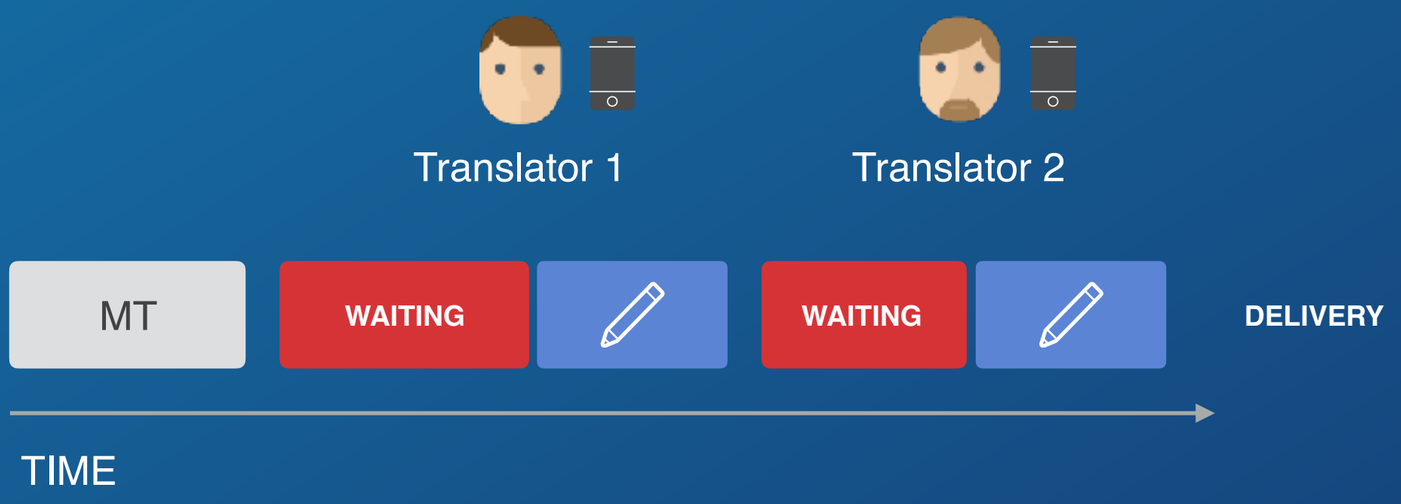
Time Spent on Job

Time Spent on Job

Time Spent on Job



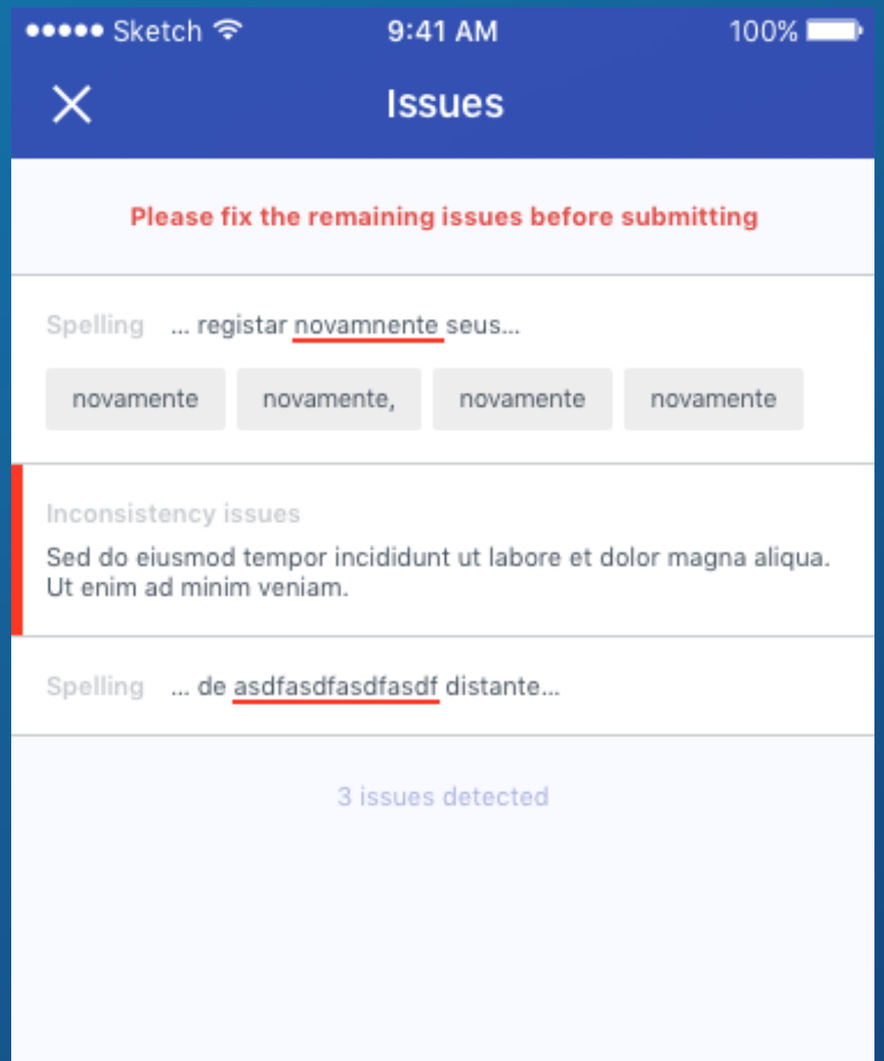
Time Spent on Job: Mobile

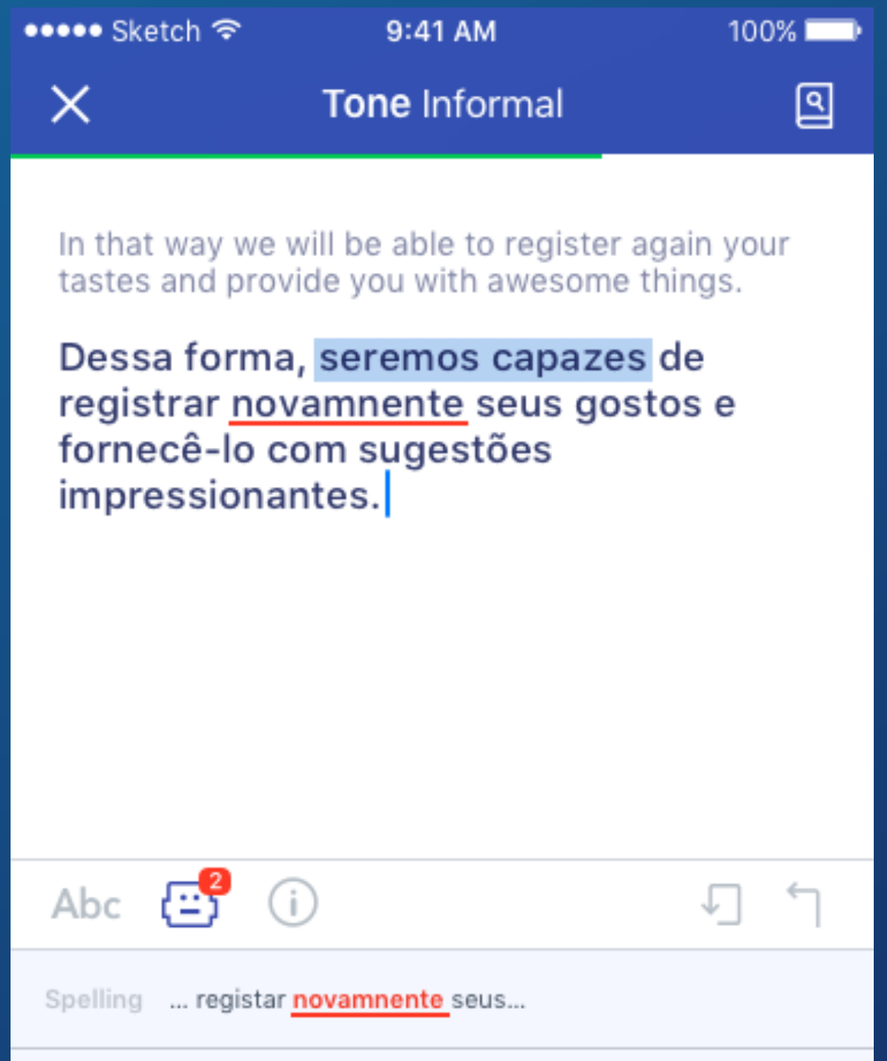


20%
less

Time Spent on Job

Pos-Editing Interfaces





Smartcheck

Smartcheck

Spelling
Tone
Formality
Consistency
Client Rule
External NLP Services
Spell Check
Syntax Parser
Word Aligner

Smartcheck

Spelling
Tone
Formality
Consistency
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Spell Check
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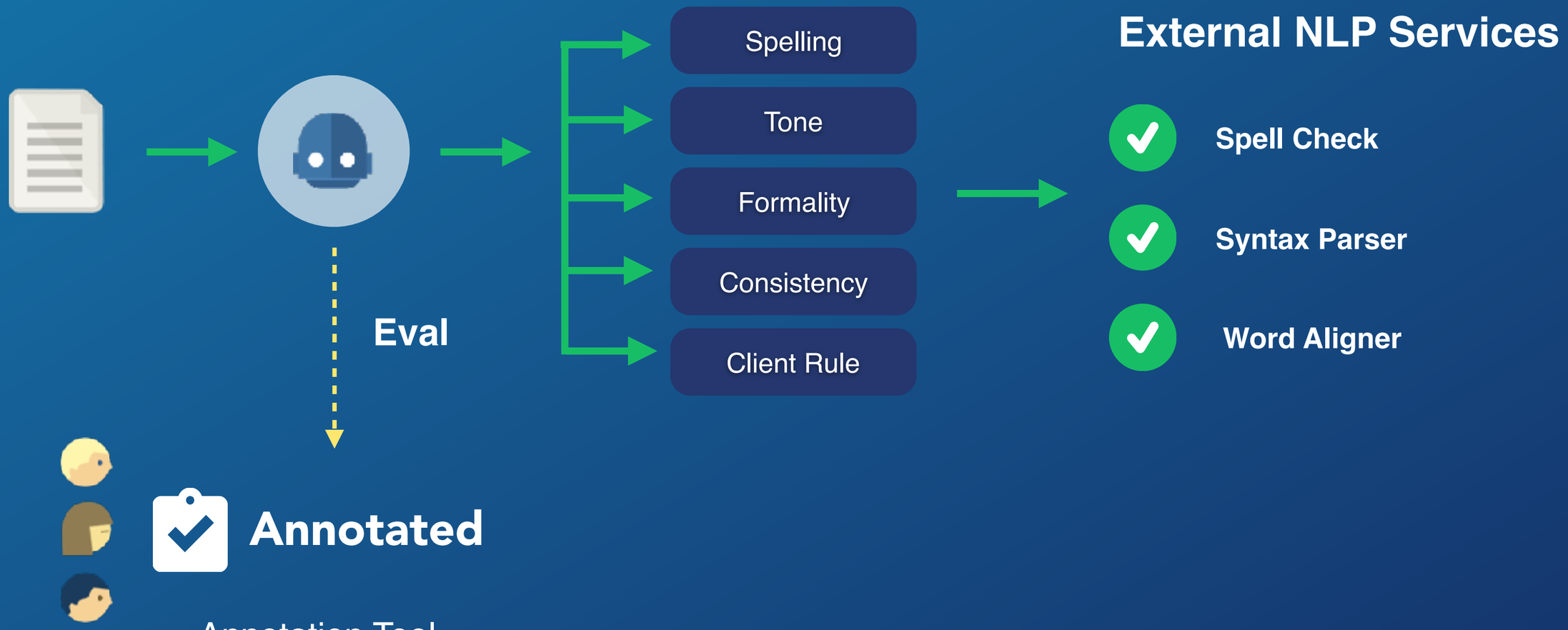
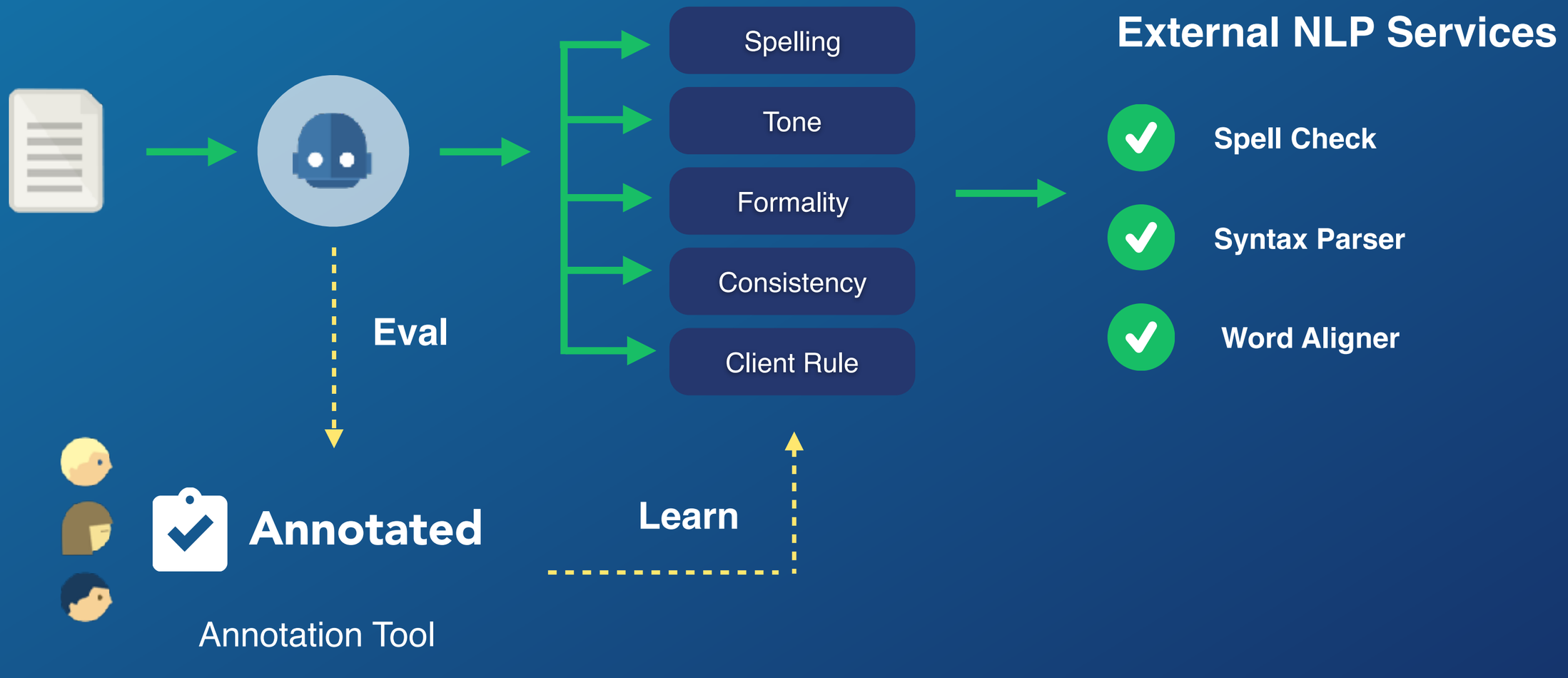
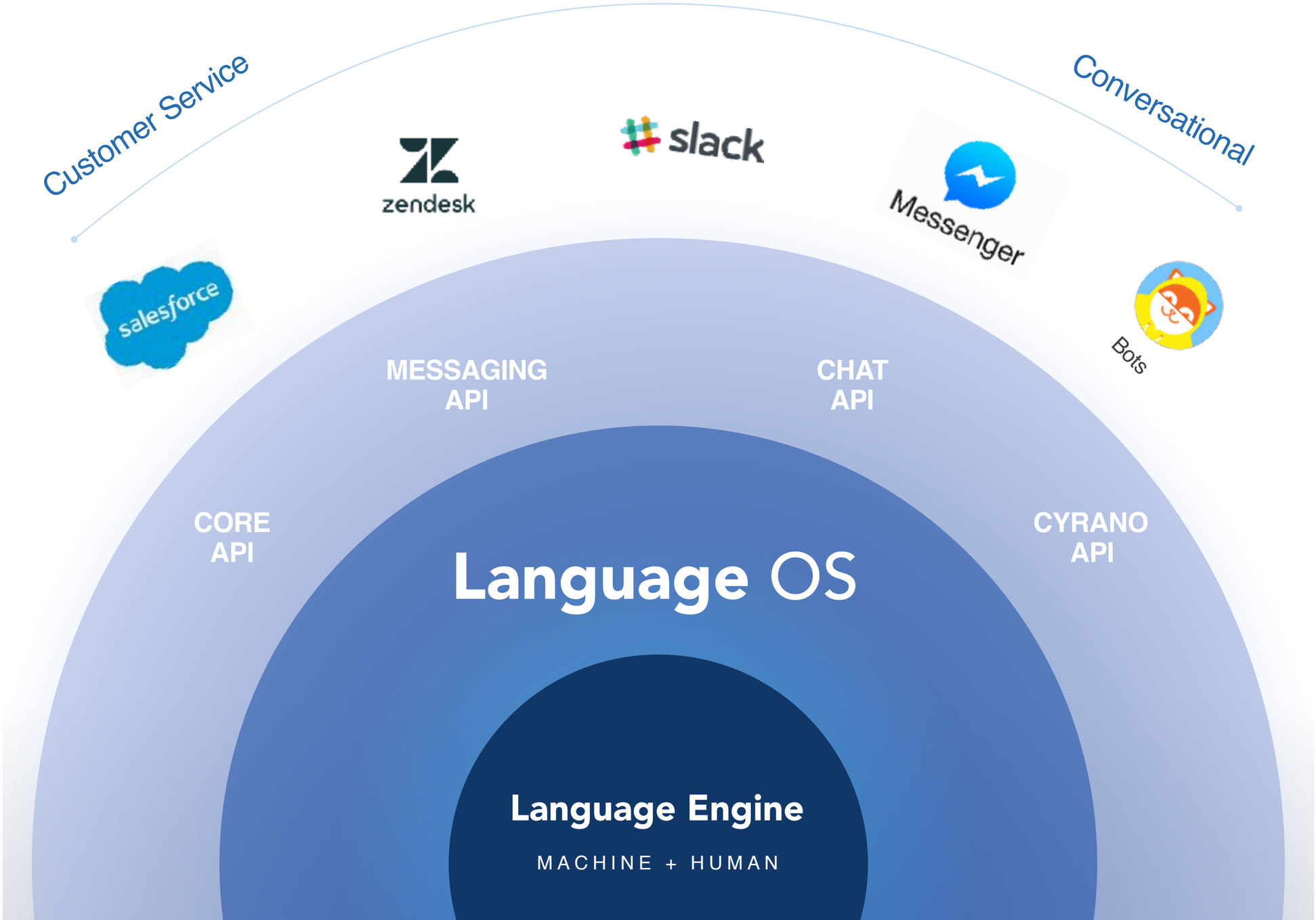
Smartcheck


Spelling
Tone
Formality
Consistency
Client Rule
External NLP Services
Spell Check
Syntax Parser
Word Aligner
Eval
Annotated
Annotation Tool

Smartcheck


Spelling
Tone
Formality
Consistency
Client Rule
External NLP Services
Spell Check
Syntax Parser
Word Aligner
Eval
Learn
Annotated
Annotation Tool


Customer Service
Conversational
zendesk
slack
Messenger
salesforce
Bots
MESSAGING API
CHAT API
CORE API
CYRANO API
Language OS
Language Engine
MACHINE + HUMAN

In Customer Service

Tickets can come
in many languages.

Unbabel for Zendesk

English-speaking agent

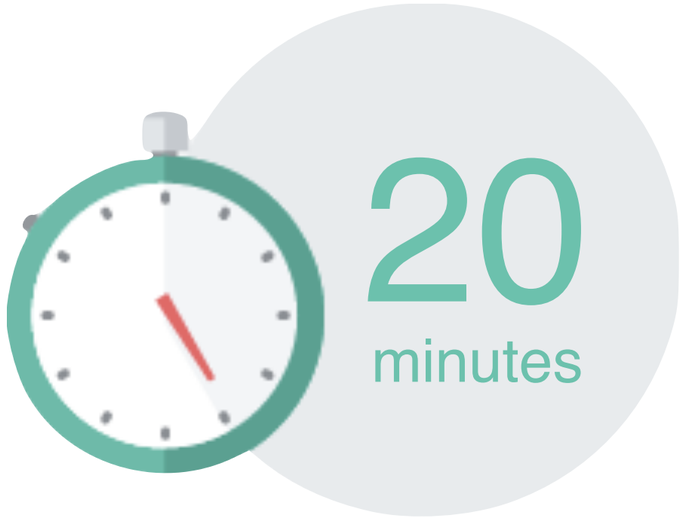
Zendesk app connected with Unbabel API

Unbabel's Domain Adapted Machine Translation

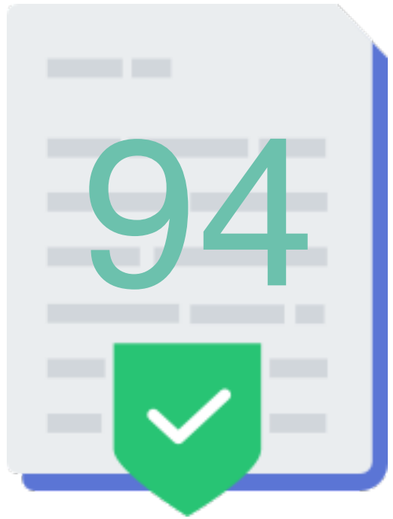
Distributed Human Translation

Unbabel can offer the **same Customer Satisfaction** as **native agents**

Customer Replies: Speed & Quality

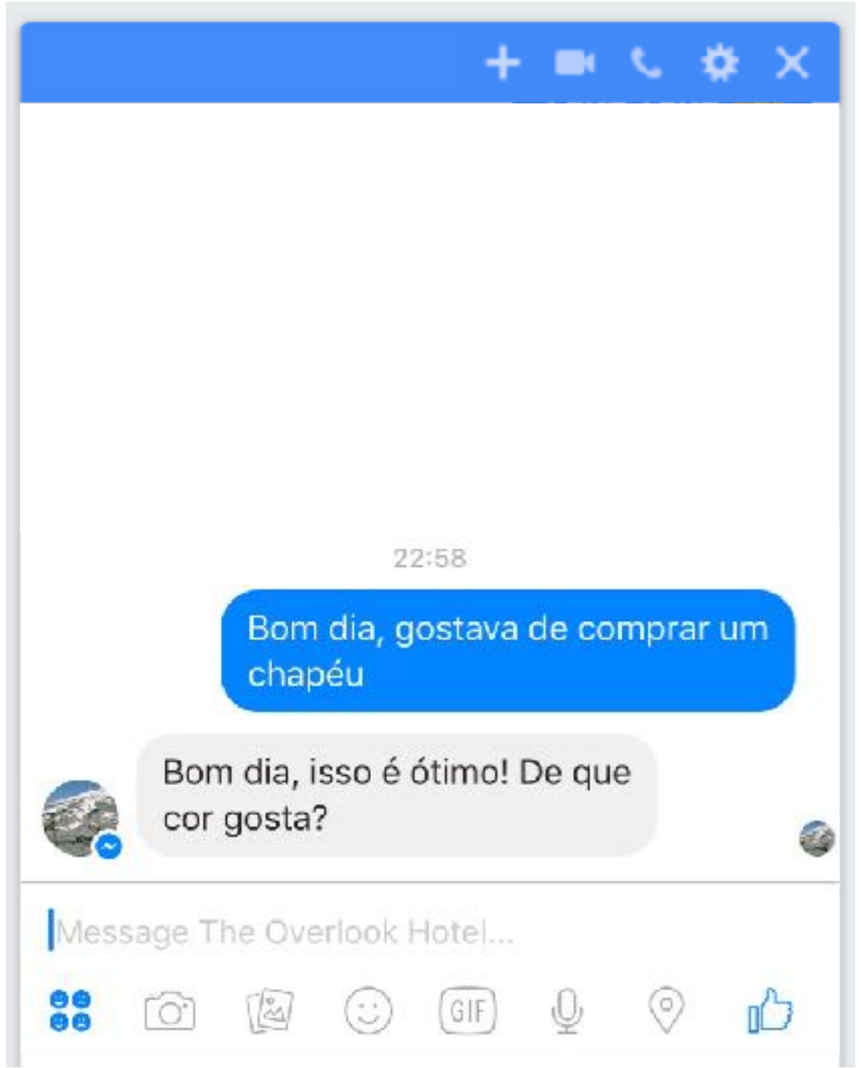


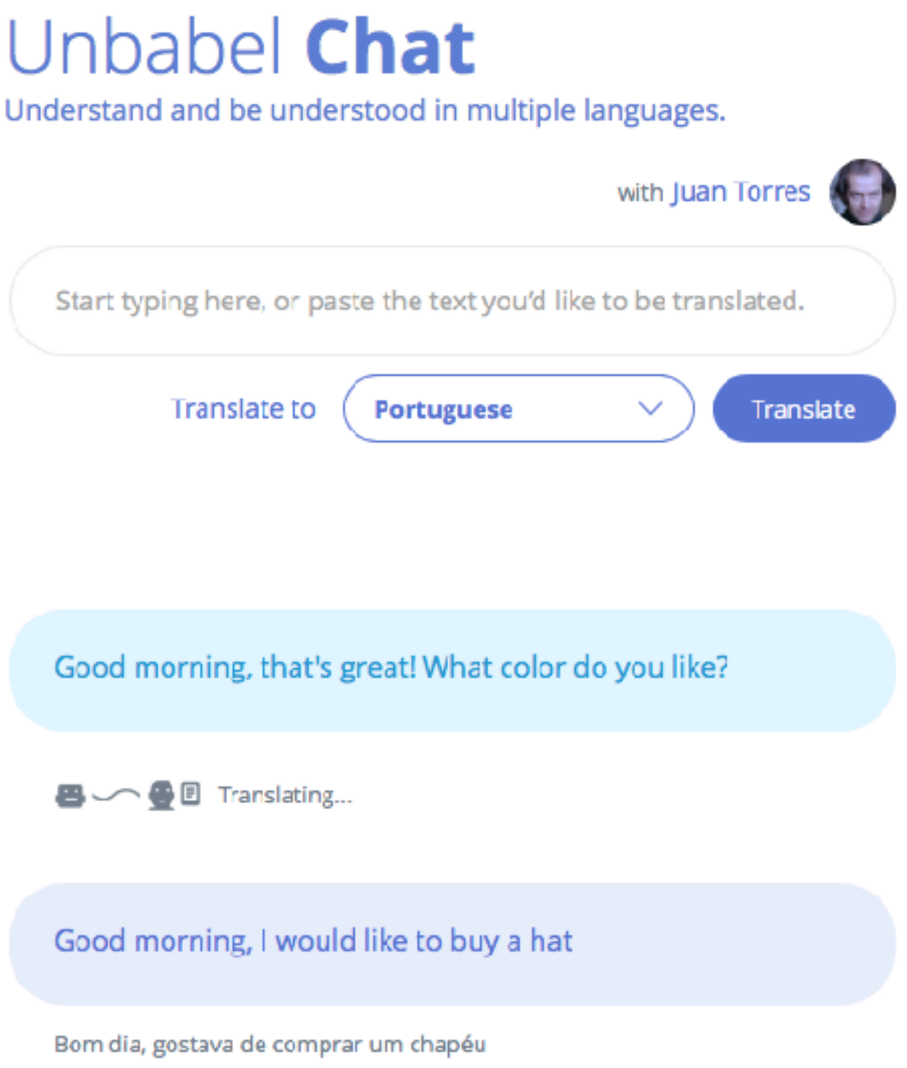
SPEED



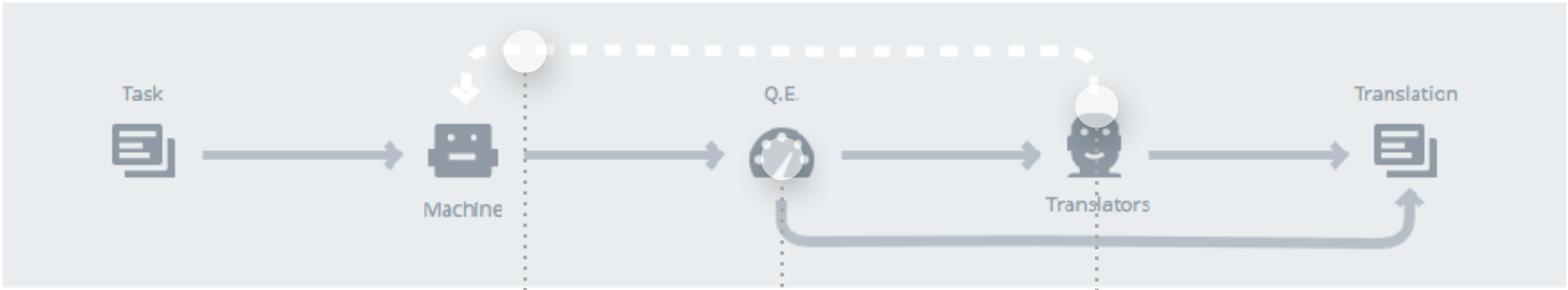
QUALITY

Chat


22:58
Bom dia, gostava de comprar um chapéu
Bom dia, isso é ótimo! De que cor gosta?
Message The Overlook Hotel...
GIF


Unbabel Chat
Understand and be understood in multiple languages.
with Juan Torres
Start typing here, or paste the text you'd like to be translated.
Translate to
Portuguese
Translate
Good morning, that's great! What color do you like?
Translating...
Good morning, I would like to buy a hat
Bom dia, gostava de comprar um chapéu

Chat Translation Flow

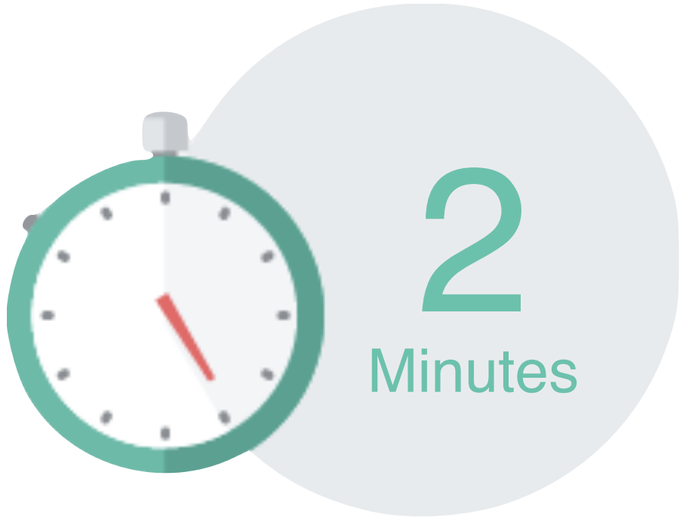


Editors train the MT engine

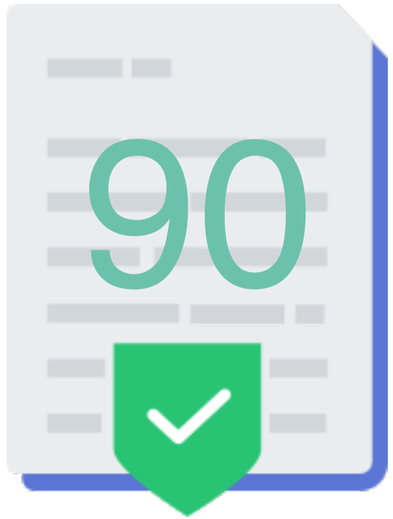
Skips Humans

Community of 50K+ translators

Chat Messages: Speed & Quality

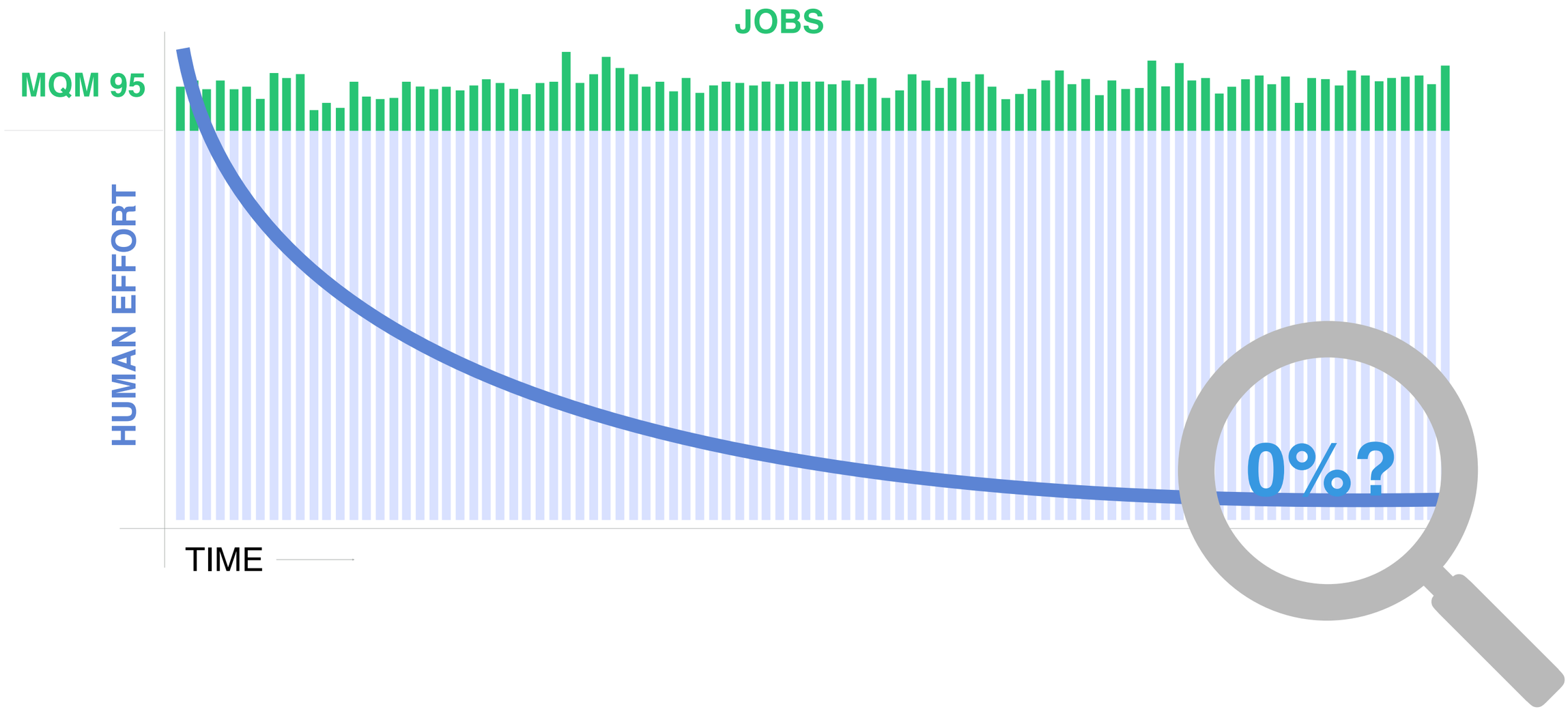


SPEED



QUALITY

What is the future?



Unbabel
Thank You
joao@unbabel.com