A critique of contemporary translation technology

The Threlford Lecture 2016
Chartered Institute of Linguists
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TRANSLATION IN THE DIGITAL AGE

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New Perspectives in Translation Studies
Edited by Michael Cronin

ROUTLEDGE

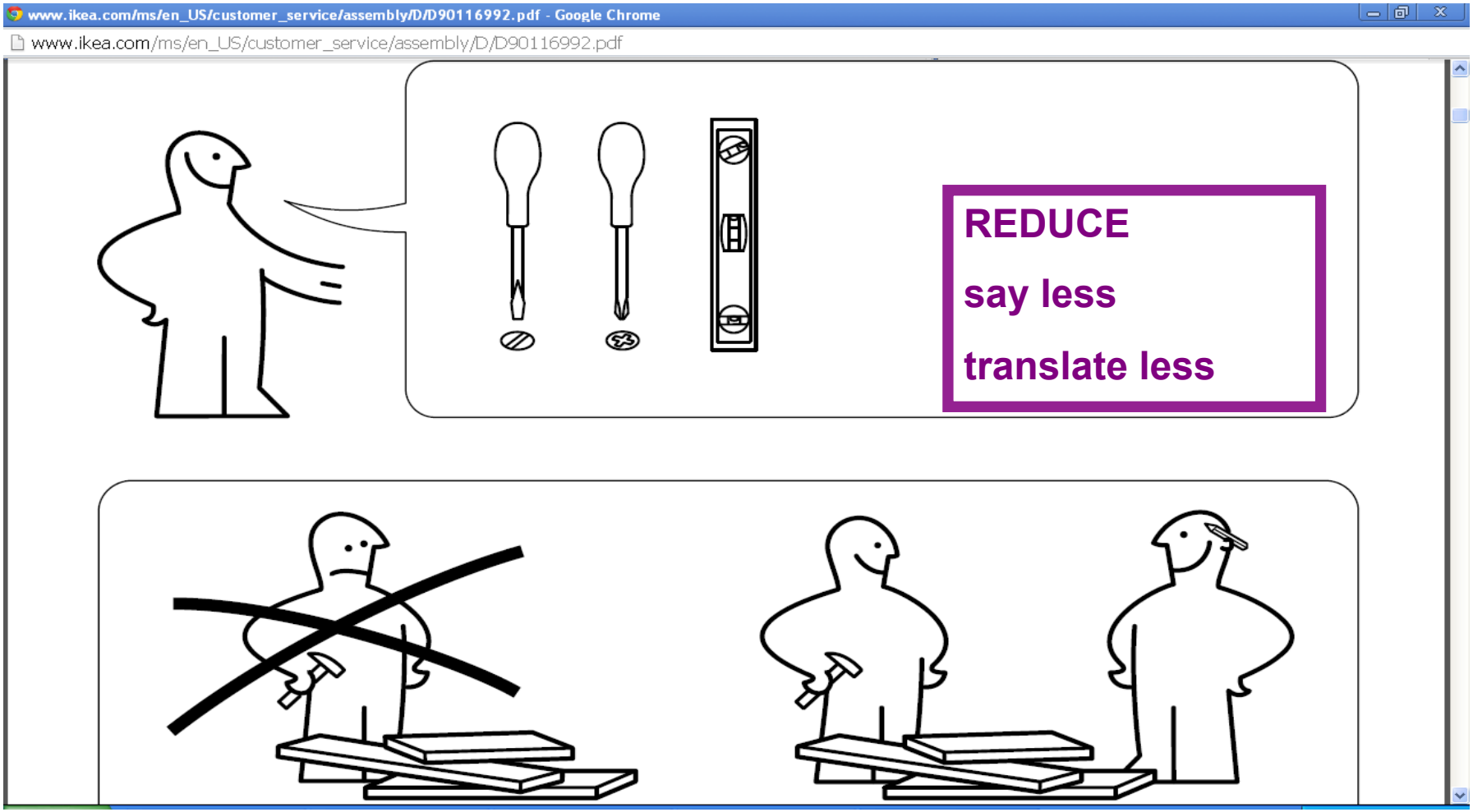
Translators are generally well disposed to technology.

(Koskinen and Ruokonen 2017)
(LeBlanc 2013, 2017)

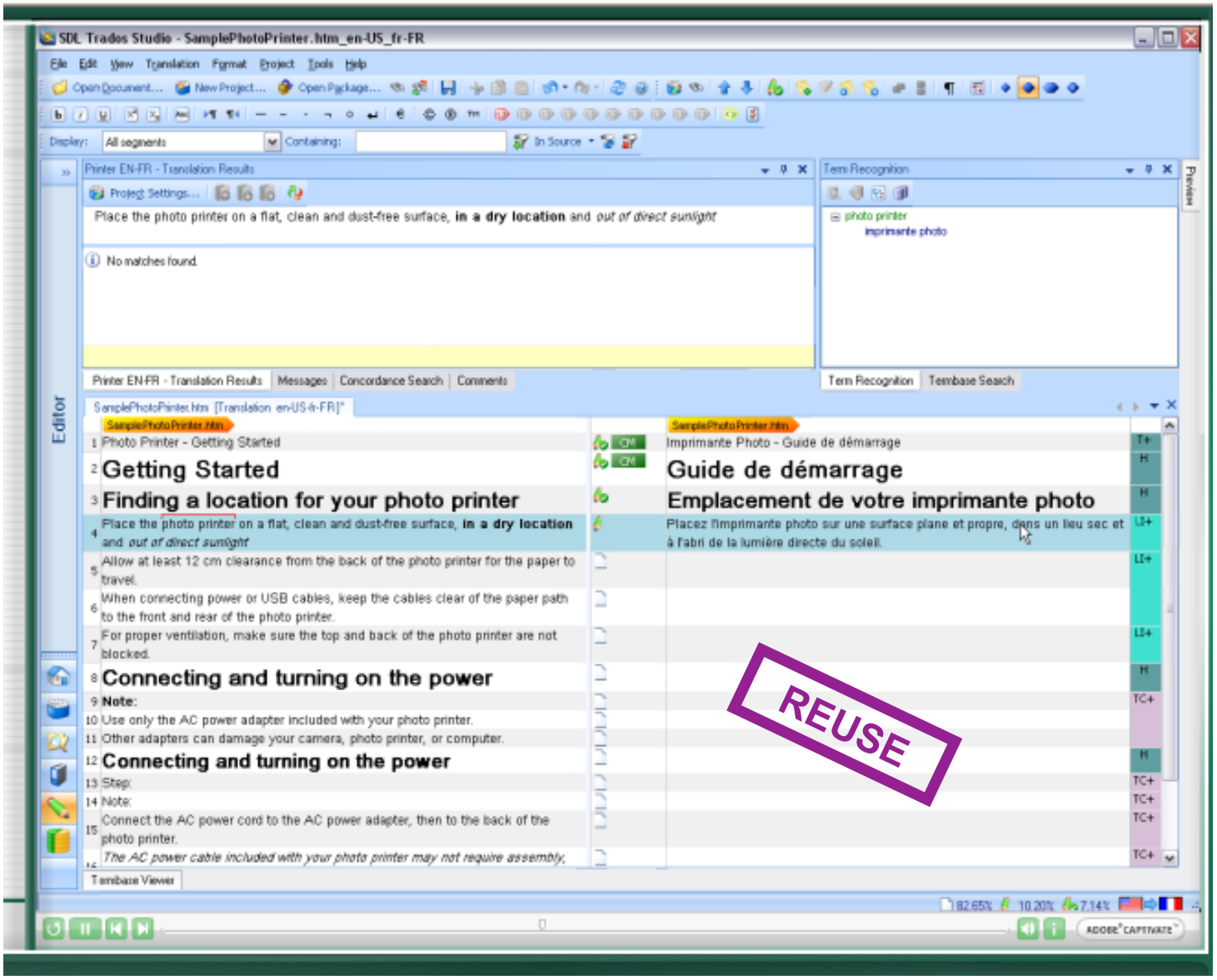
Outline

- Translation technologies (in three words)
- Impact on translation and translators
- The bigger picture

Translation Strategies



Translation Memory

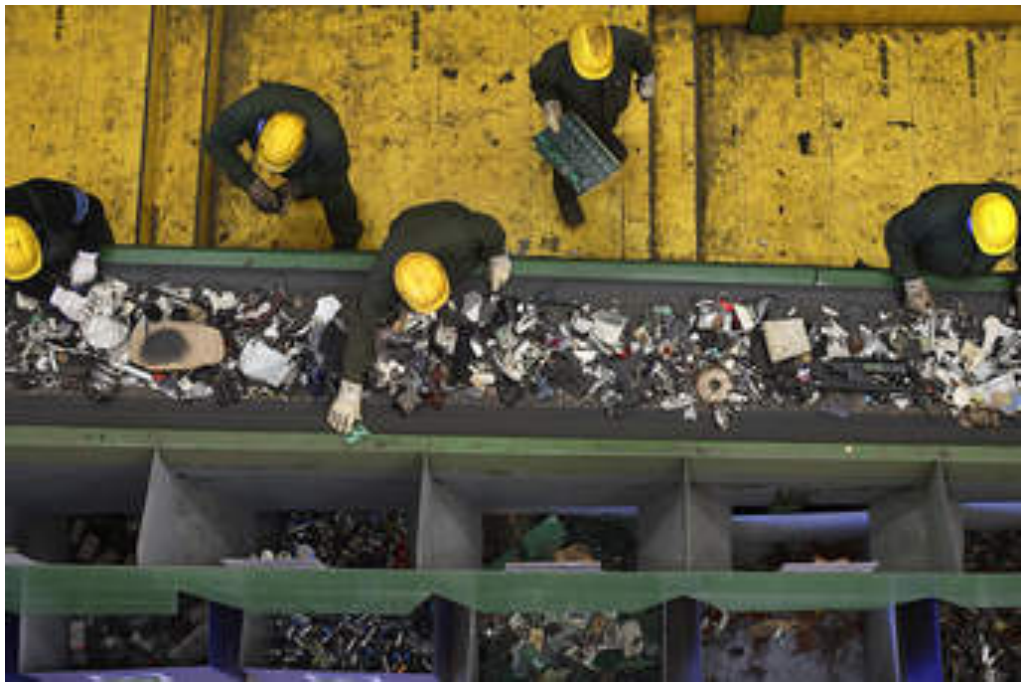


Translation Memory Tools

Statistical Machine Translation

Translations stored in translation memories can be reused.

They can also be recycled…



Example SMT Systems

Google translate

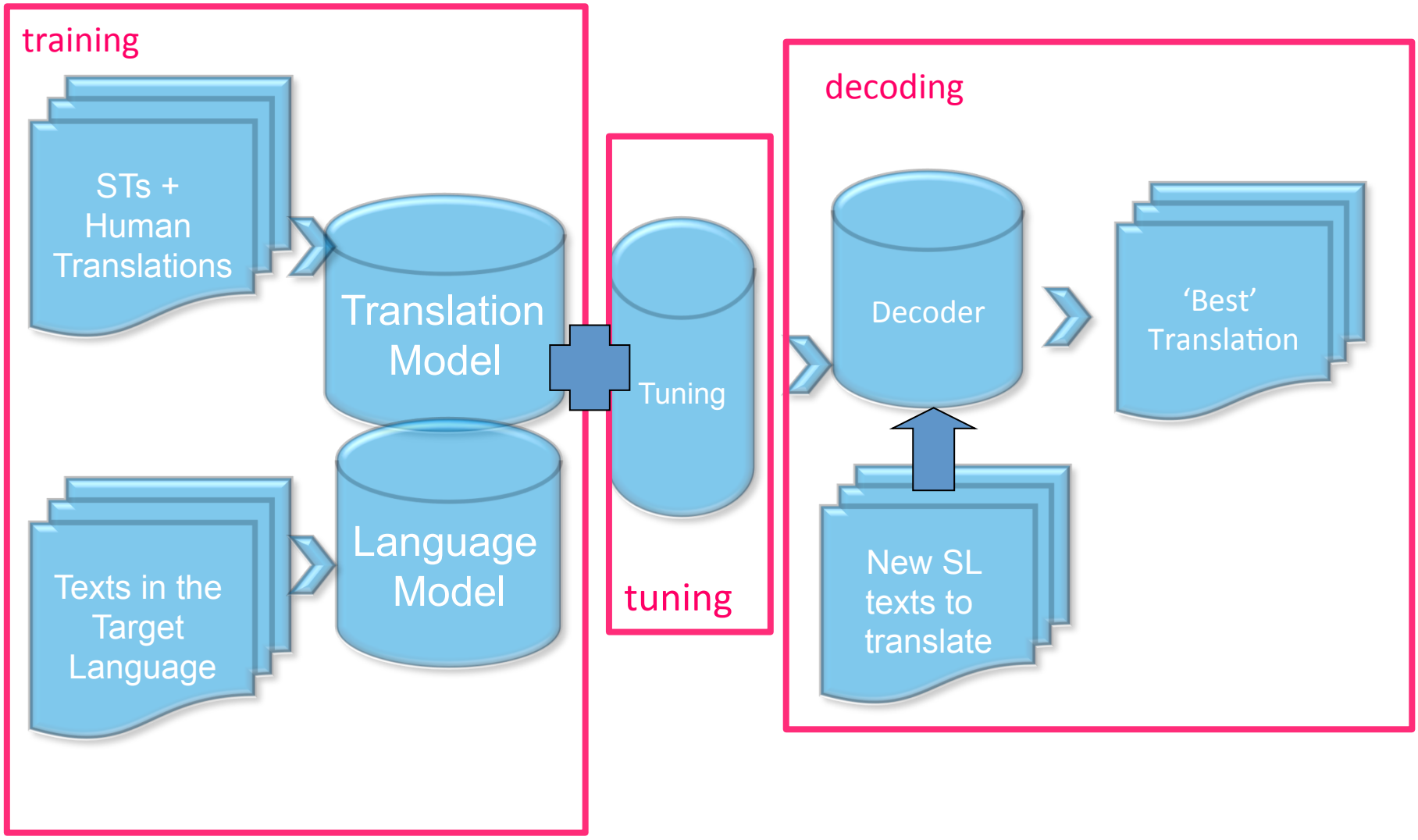
KantanMT.com

Microsoft Translator

omniscien technologies

MT@ec

SMT Architecture



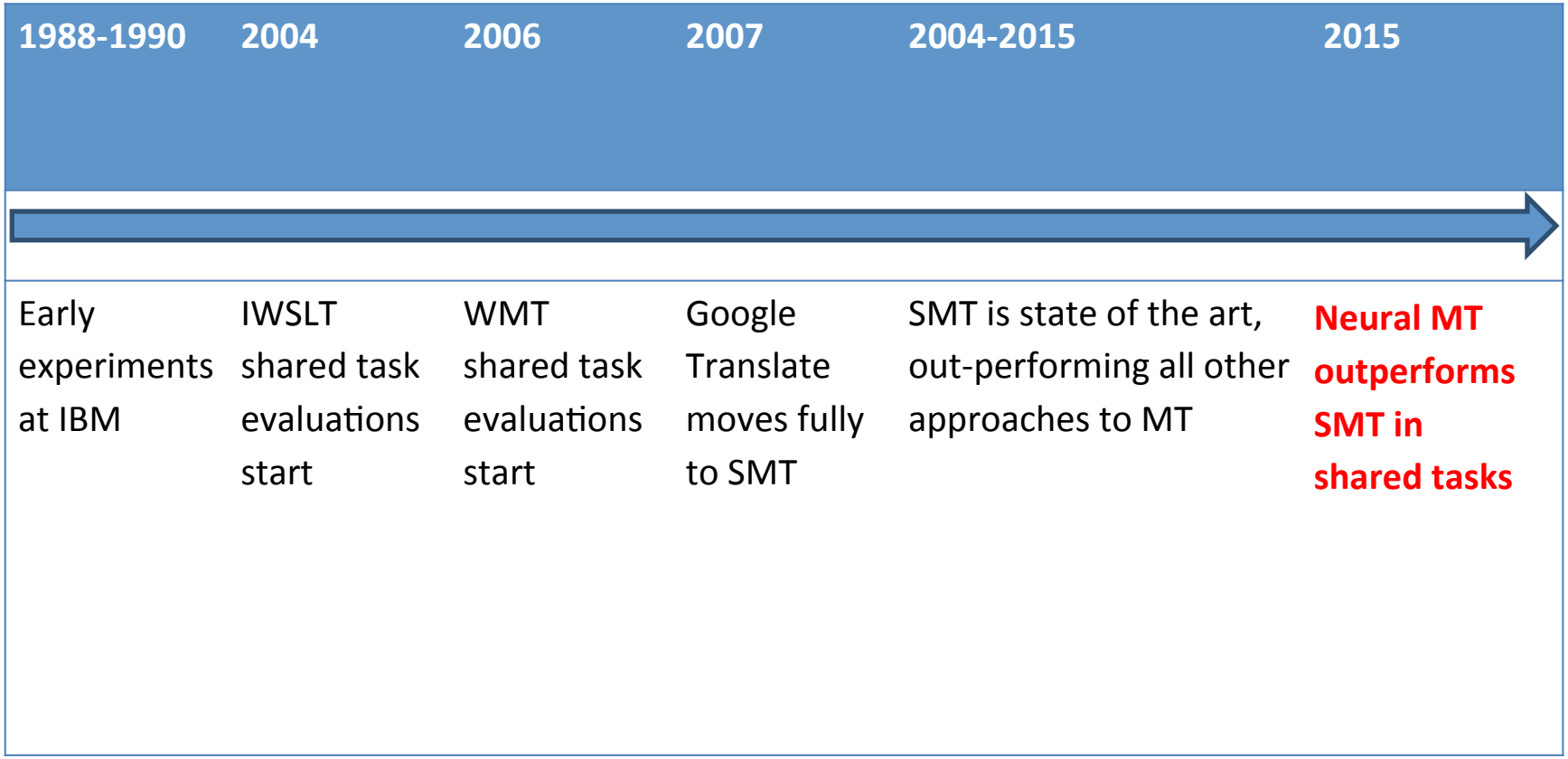
So what gets recycled?

- Phrase translations for den Vorschlag learned from the Europarl corpus:

English	$\phi(\bar{e}\|f)$	English	$\phi(\bar{e}\|f)$
the proposal	0.6227	the suggestions	0.0114
's proposal	0.1068	the proposed	0.0114
a proposal	0.0341	the motion	0.0091
the idea	0.0250	the idea of	0.0091
this proposal	0.0227	the proposal ,	0.0068
proposal	0.0205	its proposal	0.0068
of the proposal	0.0159	it	0.0068
the proposals	0.0159	...	...

Source: Philipp Koehn
http://www.statmt.org/book/slides/05-phrase-based-models.pdf

Statistical Machine Translation



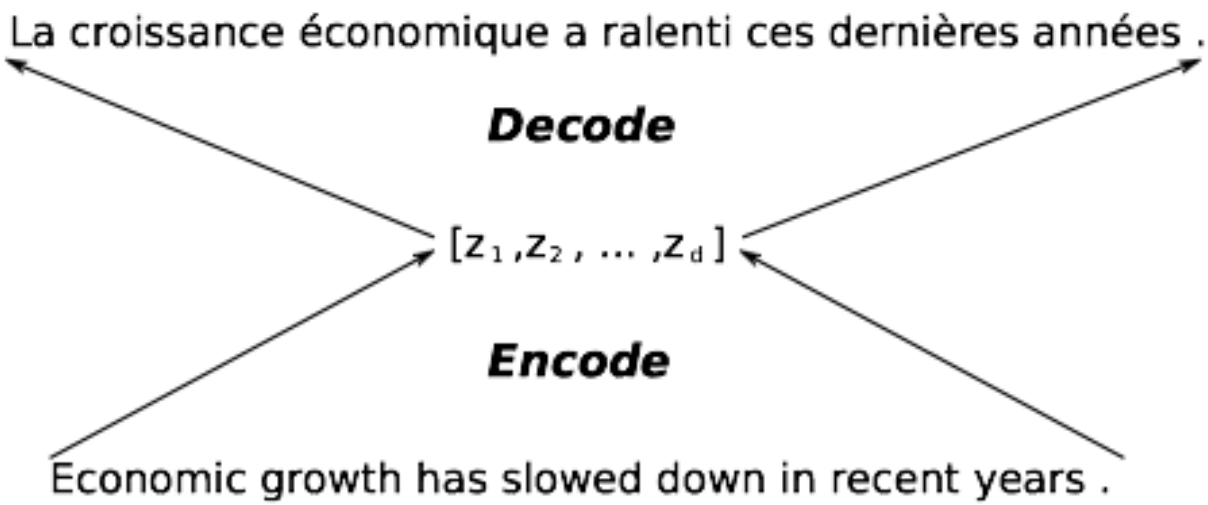
Neural Machine Translation

NMT is appealing since it is conceptually simple. NMT is essentially a big recurrent neural network that can be trained end-to-end and translates as follows. It reads through the given source words one by one until the end, and then, starts emitting one target word at a time until a special end-of-sentence symbol is produced.

Luong and Manning 2015

Neural Machine Translation

Cho et al. 2014



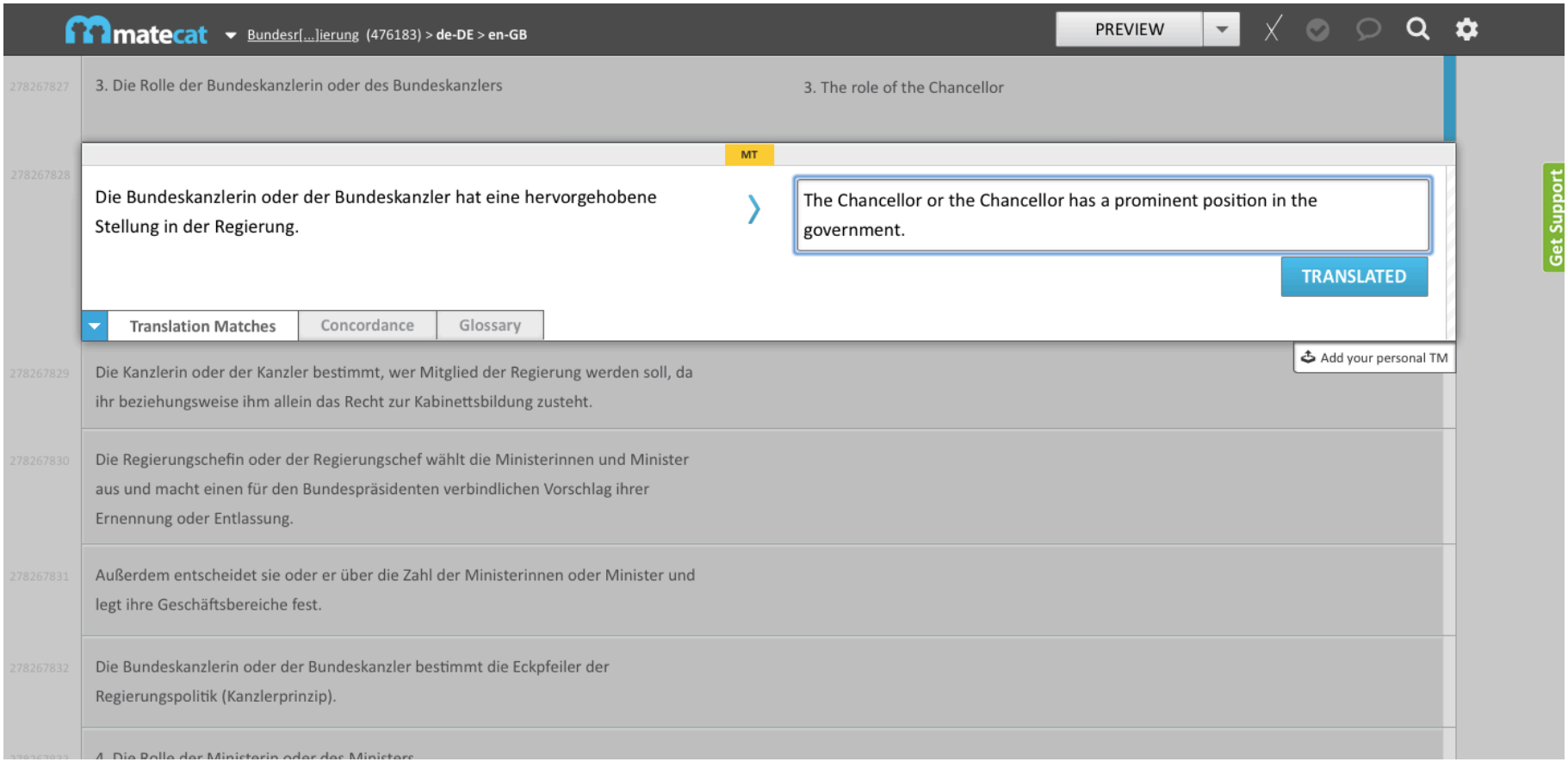
Neural Machine Translation

From the architectural point of view, a large recurrent network trained for end-to-end translation is considerably simpler than traditional MT systems that integrate multiple components and processing steps. On the other side, the NMT process is less transparent than previous paradigms. Indeed, it represents a further step in the evolution from rule-based approaches that explicitly manipulate knowledge, to the statistical/data-driven framework, still comprehensible in its inner workings, to a sub-symbolic framework in which the translation process is totally opaque to the analysis.

Bentivogli et al. 2016

Back to SMT…

TM and SMT Combined



MateCat

www.eu-bridge.eu/lecture.html

InterACT

- International Center for Advanced Communication Technologies (InterACT)
- Exzellenznetzwerk: 8 Top-Universitäten
  - Gegründet 2004
  - Direktor: Alex Waibel
- Ziel des Zentrums:
  - Ausbildung: Internationalisierung für Studierende, Mitarbeiter, Forschungsgruppen
  - Forschung: Zukunftsweisende Kommunikationstechnologien

Zunächst mal möchte ich mich selber kurz vorstellen, wie mein Name ist Alex Waibel. Ich bin der Leiter.

German-speech auto scroll

afterwards also to participate in this panel discussion will be. First of all, I would like to introduce itself briefly as my name is Alex Waibel. I am the conductor.

English-speech auto scroll

MOBILETECHNOLOGIES EU★BRIDGE

Karlsruhe Institute of Technology (KIT)
Department of Informatics

Introducing the First Simultaneous Translation Service by Computer

Skype Translator

www.skype.com/en/features/skype-translator

Responses from Translation Studies?

It is usually enough for translators who want to use [Google Translate] for initial drafting to know *nothing at all* about SMT

Robinson 2012

statistical-based MT, along with its many hybrids, is destined to turn most translators into posteditors one day, perhaps soon

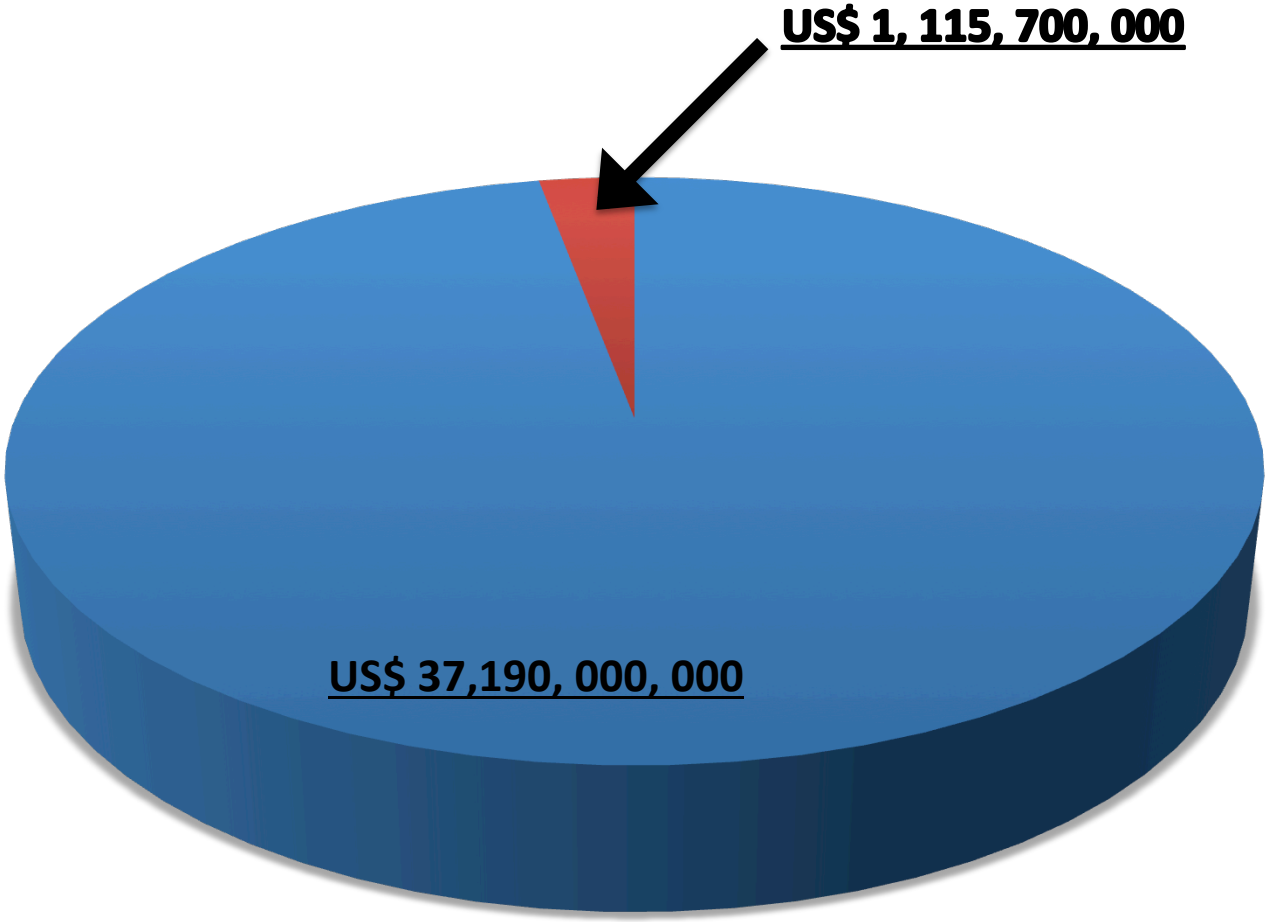
Pym 2012

the question, in the long term, will not be *whether* translation will be done from the MT baseline, but simply *when* (and for which types of text and into which languages).

Garcia 2010

The inevitability of post-editing?

Share of the translation services market accounted for by PEMT



Source: Common Sense Advisory 2014

‘The contribution of PEMT to the overall market has been slowly creeping up over the last few years, but it is still relatively small ...’

Common Sense Advisory 2014

CSA 2012: 38.63%of LSPs offered PEMT

Almaghout *et al*. 2012: 42%; Doherty *et al*. 2013: 34%

And for which … and into which languages?

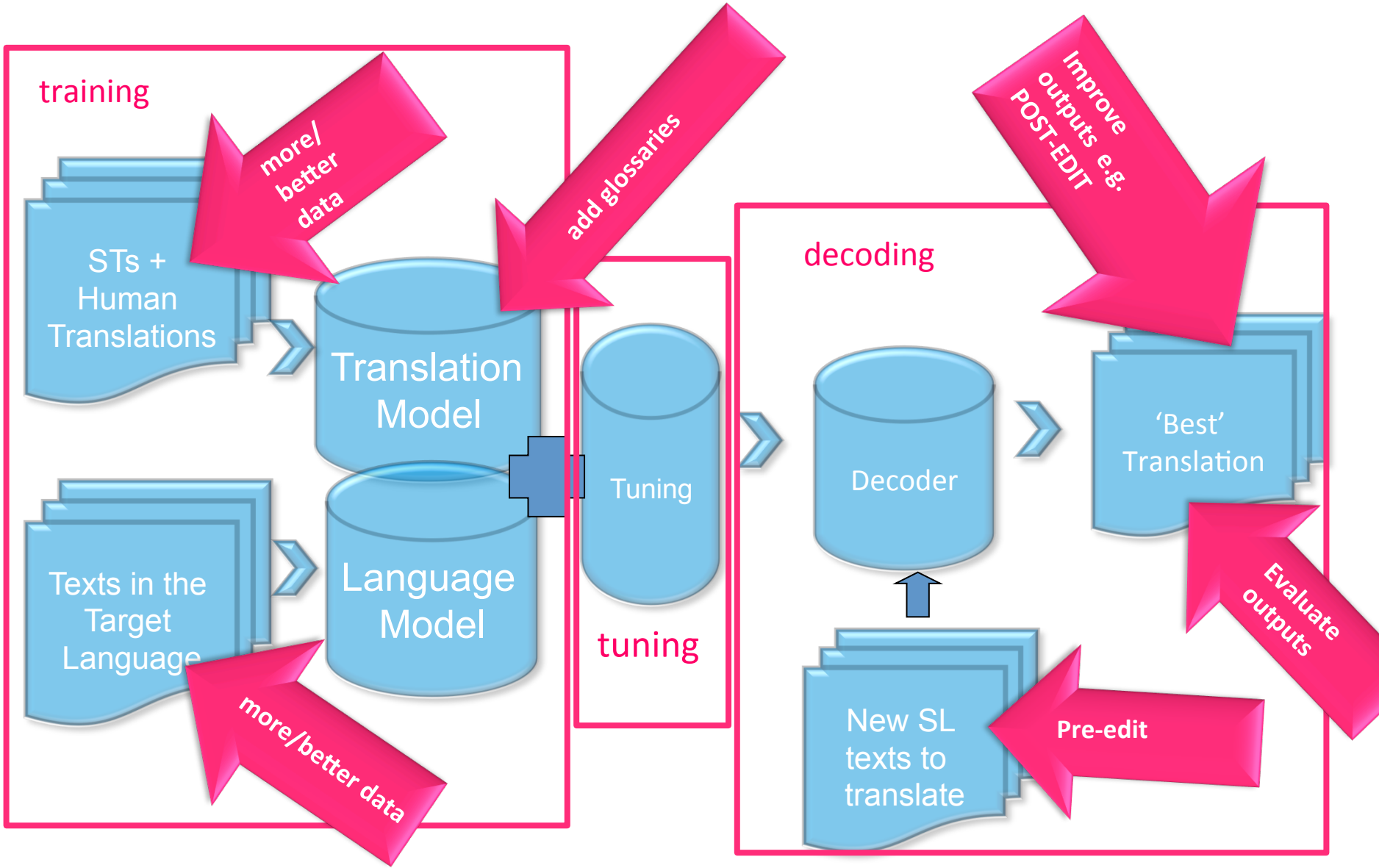
Source Language	Target Language										
	da	de	el	en	es	fr	fi	it	nl	pt	sv
da	-	18.4	21.1	28.5	26.4	28.7	14.2	22.2	21.4	24.3	28.3
de	22.3	-	20.7	25.3	25.4	27.7	11.8	21.3	23.4	23.2	20.5
el	22.7	17.4	-	27.2	**31.2**	**32.1**	11.4	26.8	20.0	27.6	21.2
en	25.2	17.6	23.2	-	**30.1**	**31.1**	13.0	25.3	21.0	27.1	24.8
es	24.1	18.2	28.3	**30.5**	-	**40.2**	12.5	**32.3**	21.4	**35.9**	23.9
fr	23.7	18.5	26.1	**30.0**	**38.4**	-	12.6	**32.4**	21.1	**35.3**	22.6
fi	20.0	14.5	18.2	21.8	21.1	22.4	-	18.3	17.0	19.1	18.8
it	21.4	16.9	24.8	27.8	**34.0**	**36.0**	11.0	-	20.0	**31.2**	20.2
nl	20.5	18.3	17.4	23.0	22.9	24.6	10.3	20.0	-	20.7	19.0
pt	23.2	18.2	26.4	**30.1**	**37.9**	**39.0**	11.9	**32.0**	20.2	-	21.9
sv	**30.3**	18.9	22.8	**30.2**	28.6	29.7	15.3	23.9	21.9	25.9	-

Table 2: BLEU scores for the 110 translation systems trained on the Europarl corpus

Source: Koehn 2005

And why just post-editing?

Possible Interventions to Improve MT Output



Issues in Post-Editing

- Environments
- Productivity
- Cognitive effort
- Enjoyment
- Payment

Post-Editing Effort?

raw MT editing effort may be equivalent to that required for 80%-90% fuzzy matches in translation memory

O'Brien 2006, Guerberof 2008

Post-Editing Enjoyment?

an edit-intensive, mechanical task that requires correction of basic linguistic errors over and over again

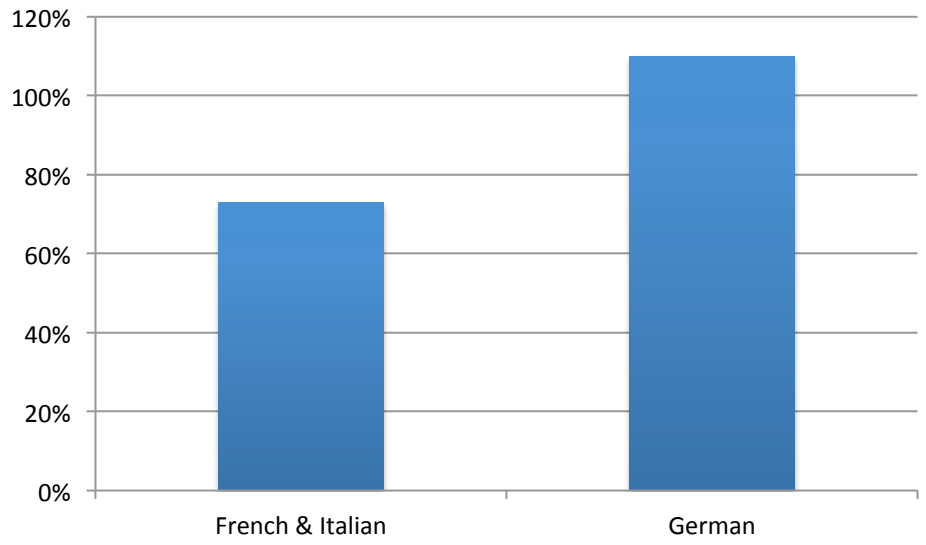
Moorkens and O'Brien 2017

it's mechanics, and if it's mechanic, there must be a way it could be done by a machine

Informant F in Moorkens and O'Brien 2017

Payment

Percentage of normal translation rate at least 75% of translators were willing to accept to take on post-editing jobs



Alessandro Cattelan's (Translated.net) purchase order acceptance rate experiment 2012
https://www.matecat.com/publications/a-fair-rate-for-post-editing/

Productivity

Productivity can be expressed in terms of two key performance indicators:

- Time to edit: the average number of words processed by the translator in a given time span
- Post-editing effort: the average percentage of word changes applied by the translator on the matches provided

Cattelan ibid.

What Post-Editors Want

- ways of eliminating repetitive tasks
- confidence scores
  - system tells the user how good or bad it thinks the SMT output it
- provenance data
  - where does the proposal from the TM/SMT system come from?
- status data
  - is the proposal already approved? Pending approval? etc.

New generation TM/MT tools

- Feed of SMT directly to editor where there is no useful translation already in translation memory
- Feature whereby translators can create their own SMT systems based on their own proprietary data
- Intelligent auto-completion
- Real-time retraining of background SMT systems
- Quality estimation (confidence scores)
- Provenance data
- Productivity information
- User Activity Logging

Confidence Measures

Lisboa y Madrid desee embarcarse en un camino diferente del adoptado por Grecia e Irlanda.

The goal of confidence measures highlighting is twofold. First, it helps the user to spot wrong translations (words with very low confidence are rendered in red). Second, it can also inform the user about the dubious translations (rendered in orange).

CasMaCat User Guide

Translation Technology in Translation Studies

Focus has been on description of tools, their functions and design, and 'how to' guides written for pedagogical/training purposes.

Far less emphasis on the "deeper implications of these technologies set within a wider spectrum of cultural (i.e. ethical, political, social) concerns"

(Folaron 2013: 6)

Not to mention economic and legal concerns…

Professional ethics and SMT

In the case of Free Online MT

- breach of contract
- confidentiality (despite 'anonymisation')
- permission to use others' work
- attribution (Drugan and Babych 2010)

Translators constantly concerned about having to work to lower quality standards, to produce just ‘good enough’ (post-edited) translation (see Drugan 2013)

Translation ethics (Chesterman 2001)

Typical foci:

- representation of STs, authors, the Other
- service, communication, norms

What about the world's responsibility towards translators and interpreters?

This would belong to 'a general ethics of translation and translatorial behaviour'.

Translation ethics

virtue: 'an acquired human quality that helps a person strive for excellence in a practice'

in order to make the best ethical decisions, the most important virtue that a translator can possess is the desire to make the right decision:

'the translator must *want* to be a *good* translator, must strive for excellence in the practice of translation'

(Chesterman 2001)

The post-editor's dilemma?

How can you strive to be your best at being just 'good enough'?

Kenny 2011

The Ethics of Representation: Translation as a natural resource

'[Microsoft's] largest available natural resource is the nearly two decades of product documentation that has been localized into an increasing range of languages and preserved as translation memories.'

Joscelyne (2009: 7)

Natural Resource Metaphor

~45 instances of discovery of/discover*+dir obj

N	Concordance
17	exists. However, this was not sufficiently balanced by a conservative discovery of correspondences in the pair extraction algorithm. Although the
18	subset of the phrase pairs in the Baseline+Syntax model.10 This discovery is a very positive and interesting by-product of these experiments.
19	cognates (Sect. 4.1) and an algorithm for applying the induced rules to the discovery of potential cognates in a corpus (Sect. 4.2). 4.1 Learning
20	and used to group together related data. This approach supports the discovery of knowledge from the acquired data (i.e. from the ground) instead
21	Till now, the focus of most of the investigations in this field has been on the discovery and pairing of bilingual sites, domains, HTML documents and
22	available texts, we propose and investigate a general framework for the discovery of such expressions from comparable corpora. The main practical
23	not received much attention, possibly because in many applications the discovery of translationally equivalent vocabulary items was the main goal
24	to search for their translations in the French sentences. This makes the discovery of the different translation possibilities more difficult (adaptées à,
25	text needs to be produced by translators before it can be used for the discovery of new dictionary entries. Bilingual comparable corpora are an

Kenny (in preparation)

Natural Resource Metaphor

9 instances of MINE in the *Machine Translation* Corpus, e.g.:

N	Concordance
1	parallel alignment approaches. We are interested in (1) how to mine web content and prepare HTML files for bilingual text alignm
2	of bilingual corpus building. What we need is to seek ways to mine the widely available web resources to bridge the gap in the
3	accessing server-resident databases. Translators can still mine their own databases, and expand them with the translation u
4	previously have been shown to profit from translation equivalents mined from comparable corpora, including construction of probabi
5	translation extraction of web-based materials is mostly related to mining web contents as a bilingual corpus and aligning the bilingu
6	on data source acquisition for natural language processing tasks by mining the world wide web. Representative works related to the

655 instances of EXTRACT in the *Machine Translation* Corpus, e.g.:

N	Concordance
370	texts. These are also the two primary challenges facing systems that extract translations from bilingual websites. As we know, the building
371	rder are going to be preferable to orderings which are very different. We first extract permutations from alignments, and then apply standard distan
372	parser with deterministic head-finding, while Owczarzak et al. (2007a) extract the semantic dependency relations from an LFG parser (Cahi
373	to lemmas and suffixes. 4. Apply morphological transformation rules. 5. Extract the surface string. For syntactic transformation, we propose a
374	original is aligned with its translation at the sentence level) can be used to extract newdictionary entries with high accuracy (Dagan and Church
375	nodes. Starting from this definition, a linear-time algorithm is proposed to extract translation rules through one-time traversal of the leaf nodes i
376	make use of new tools to automatically build a large parallel treebank and extract a set of linguistically-motivated phrase pairs from it. We show
377	news releases in the StatCan publication The Daily. The goal is to extract translations for translation memory systems, for translation
378	Abstract Statistical methods to extract translational equivalents from non-parallel corpora hold the pro

Kenny (in preparation)

Ethics and Translation Teaching

If we move straight to 'translating from MT',

what other previous, hard-earned accomplishment might be put in jeopardy?

(Garcia 2010, 2011)

(Hirshmann 1991; Morozov 2013)

Ethics and New Translation Tools

Surveillance?

Higher risk of ‘data dispossession’?

Economics

“We’ve decided not to pay most people for performing the new roles that are valuable in relation to the latest technologies. Ordinary people ‘share’, while elite network presences generate unprecedented fortunes.”

“in the long term, this way of using network technology is not even good for the richest and most powerful players, because their ultimate source of wealth can only be a growing economy. Pretending that data come from the heavens instead of from people can’t help but eventually shrink the overall economy.”

(Lanier 2013: 11,12)

Legal Issues

Source documents to be translated will …generally be protected under copyright in the European Union. Similarly, short segments (bits and pieces of such source documents and translations) may also be protected by copyright.
The length of a work is …not per se a pertinent criterion to assess originality

Troussel and Debussche (2014)

Social Issues: Shifting Identities

- ‘cross-language carriers’ (Joscelyne and Van der Meer 2008)
- ‘post-editor’ used to describe person editing matches from translation memory, as well as translations from an MT engine (e.g. Guerberof 2008)
- ‘monolingual translator’ used to describe post-editor with no knowledge of the SL (Koehn 2010; Koehn et al. 2013)
- ‘translating by post-editing’ (Garcia 2011)

Boundary Shifters

The actors in my study also morph their identities. Musicians on occasion turn into salesmen; engineers on occasion turn into musicians; and engineers can become salesmen…When the modular Moog synthesizer was first used in recording studios, no one knew what to call its operators: were they engineers, programmers, producers, musicians, or what?...I call these actors "boundary shifters.'

Pinch (2008)

Moving towards a conclusion

Technoneutrals

“on the one hand this, but on the other hand that”

(Tehranian 1990; Morozov 2013)

Science and Technology Studies

The impact of a technology:

- is always mediated through institutions and social forces
- does not flow from the inherent characteristics of the technology
- is not neutral
- depends on the context

And finally:

The time is ripe for even more research into translation technology that comes from within the humanities and social sciences.

We need more sociologically-oriented, ethically-aware, critical research in translation technology.

Thank you!

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