

Translation and the Internet. Evaluating the Quality of Free Online Machine Translators

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Abstract

The late 1990s saw the advent of free online machine translators such as *Babelfish*, *Google Translate* and *Transtext*. Professional opinion regarding the quality of the translations provided by them, oscillates wildly from the «laughably bad» (Ali, 2007) to «a tremendous success» (Yang and Lange, 1998). While the literature on commercial machine translators is vast, there are only a handful of studies, mostly in blog format, that evaluate and rank free online machine translators. This paper offers a review of the most significant contributions in that field with an emphasis on two key issues: (i) the need for a ranking system; (ii) the results of a ranking system devised by the authors of this paper. Our small-scale evaluation of the performance of ten free machine translators (FMTs) in «league table» format shows what a user can expect from an individual FMT in terms of translation quality. Our rankings are a first tentative step towards allowing the user to make an informed choice as to the most appropriate FMT for his/her source text and thus produce higher FMT target text quality.

Key words: free online machine translators, evaluation, internet, ranking system.

Resum

Durant la darrera dècada del segle xx s'introdueixen els traductors online gratuïts (TOG), com poden ser *Babelfish*, *Google Translate* o *Transtext*. L'opinió per part de la crítica professional sobre aquestes traduccions es mou des d'una ingrata ridiculització (Ali, 2007) a l'acceptació més incondicional (Yang i Lange, 1998). Actualment, els estudis valoratius sobre els TOG són realment escassos, la majoria en format blog, mentre que la literatura sobre els traductors comercials és enorme. L'article que plantejgem aporta una revisió de les principals contribucions i posa l'èmfasi bàsicament en dues qüestions: (i) necessitat d'un sistema de classificació (un rànquing) i (ii) descripció dels resultats obtinguts pel sistema de classificació ideat pels autors d'aquest article. L'avaluació que realitzem a petita escala es basa en l'anàlisi de l'actuació de deu TOG en un rànquing que posa de manifest les expectatives que en termes de qualitat de traducció pot esperar l'usuari. El resultat del rànquing ofereix a l'usuari els criteris que millor s'ajusten a cada cas, per tal d'utilitzar un traductor o un altre en funció del text original, i obtenir com a resultat una traducció de qualitat considerable.

Paraules clau: traductor online gratuït, avaluació, internet, rànquing.

Summary

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1. Introduction

Firms selling language translation technologies have become increasingly concerned about the quality of their product compared to competitors. For example, the Systran translation company, in its 2008 news flashes (see table 1), states quite bluntly that their translator outperforms *Google Translate* and provides better quality translations than *Google Translate* does.

Table 1. Systrans news flashes

News flash 1#

Systran's ground breaking hybrid machine translation engine outperforms Google Translate and others in English to French translation.

News flash 2#

Systran, the leading provider of language translation technologies, today announced that it ranked first in an English to French task at the fourth annual Workshop on Statistical Machine Translation in Athens, Greece. The goal of the competition was to compare the quality of multiple machine translation systems for 10 European language pairs, and to set up objective criteria for machine translation quality.

The evaluators for the Translation Software Review <http://translation-software-review.toptenreviews.com> provides the following ranking for the top ten commercial translator software products.

Table 2. Commercial MT Software Ranking

Rank	Translation Software
1	Babylon
2	@prompt
3	Systran
4	Power Translator
5	Translate Personal
6	Translution
7	Lingovsoft
8	IdiomaX
9	Word Magic
10	NueroTran

Perhaps one of the most exciting areas of research in Machine Translation is to investigate free of charge Internet on-line service translators. Our own research provides a ranking for *free* online machine translators (*not* the commercial translation MT software applications mentioned in table 2 which cost upward of 150 dollars). Although there are many free machine translators (FMTs) on the Internet, there are no league tables or «ranking system» to evaluate their effectiveness. There is, however, increasing public demand for free machine translation for «gist» purposes. One example is the FMT *Transparent Language* running an on-line free translation service and receiving 2,000 translation requests in typical one-hour period. Eight years later, the website (www.freetranslation.com) is still going strong with two million visits a week. Even more remarkably, the FMT *FreeTranslation* as of September 2006 receives 4,000 translation requests per *minute* during peak usage between 8.00 and 10.00 p.m. Eastern Standard Time.

The general public are faced with a bewildering choice of FMTs to select from: *Babelfish*, *Translator Online*, *Foreign Word*, *Web Trance*, *Prompt*, *Verbalis*, or *Google Translate* to name but a few. Surprisingly, up to now, no attempt has been made to evaluate them in the form of a ranking. The purpose of this paper is to fill this niche by creating a ranking system to help users to decide which free online machine translators are most useful for their purposes. The framework we use to create the ranking is similar to the Translate Software Review explained above. However our criteria for evaluating FMTs are different as can be seen from the methodology section of this paper.

1.1 *On the need for a ranking system*

There is a need for a free online machine translation ranking system and our decision to create a ranking system is based on the Berlin Principles (2006):

1. *rankings respond to demands from consumers for easily interpretable information on the quality of FMTs.* Flanagan (1996) reports that when FMT Babel Fish initially went online, users were firing off «angry email messages» regarding the quality of the translations but she also explains that other users were «overwhelmingly satisfied»! Blogs show that mixed reactions from users in 2009 is still the case. Ranking the usefulness (accuracy) of FMTs may help the end user to decide which FMT suits his or her purpose.
2. *rankings provide a rationale and set of criteria for evaluating FMTs.* Church and Hovy (1993) point out that «it should be clear what the FMT can and cannot do», especially in the case of translation services which are intended for large scale use by the general public.
3. *rankings contribute to a definition of machine translation quality.* Improving the quality of FMT is necessary for providers to avoid possible lawsuits. Westfall (1996) refers to the potential risk of litigation against FMT providers such as BabelFish when a flawed translation leads to safety violations.

Although rankings provoke fierce methodological criticism, they are completely credible at mainstream public opinion and higher education policy levels (Marginson, 2007). Finally, there is a need for more transparency from the translation industry regarding FMTs. Strangely, the professional community has largely ignored discussion of these *free* services and their effect on commercial software in the wider world. Zervaki (2002) indicates that competition between firms almost certainly accounts for companies reluctance to provide research institutions such as universities with feedback from users on the quality of the translation. Indeed, the current status of such information is probably confidential in a highly competitive world. Nonetheless, our intention is to try and unveil the quality of the FMTs on internet and reveal their individual strengths and weaknesses.

2. A review of the FMT literature

Up to December 9th 1997, MT services were only available to paying customers. Nevertheless, the Babel Fish ushered in a new era of *free* translations for the internet user and this meant unprecedented accessibility for the general public to FMT. Recent studies look at FMTs from a range of perspectives such as:

- the quality of translations produced by FMTs in different languages,
- their effect on translation studies, and
- the extent to which professional translators use them.

However our paper concerns FMT rankings (see 2.1) and we have found a tiny number of academic studies devoted to rankings and various blog ads such as Techscribe; makeuseof.com; Noop.nl, which, in our view, are examples of marketing ploys rather than academic studies. However, sadly, none of these studies or ads venture to rank more than four FMTs.

Regarding the quality of translations produced by FMTs in different languages, a relatively early study by Watters and Patel (1999) carried out a number of tests on *Babel Fish* to translate four proverbs in English into five target languages (French, German, Italian, Portuguese and Spanish) and then back into English to see which mistakes occurred. From twenty such «round trip» translations only two were translated successfully.

Chalabi (2000) describes use of an FMT to translate Arabic to English and claims 65% accuracy. Izvani (2006) reviews tests on *Google Translate*, *Sakhr* and *Systran* and makes recommendations as to how they might be improved. Murata and Yamamoto (1999) explain an FMT to translate web pages from English to Japanese and conclude favourably regarding processing speeds for users. Choi (1998) focuses on the syntactic differences between English and Korean and provides recommendations to avoid the problems caused by different syntax for translation quality. Boonkwan and Kawtrakul (2002) address the unsatisfactory quality of an English-Thai FMT. No formal evaluation tests are made but there are suggestions as to how to enhance the quality of translation performance through resolving lexical disambiguation problems.

Translation studies have been changed by the presence of FMTs on Internet. Munday (2001) notes that Internet FMTs are changing the status and visibility of translation studies. Chesterman and Wagner (2002) suggest that the general public may become more interested in translation as a result. The well-known novelist, Eco (2003) looks at the four short texts translated by *Babel Fish* in four languages (French, German, English and Italian) and notes its strengths and weaknesses.

The data available on the use of FMTs in the translation industry is scant. Fulford (2002) indicates that a study of thirty professional translators showed that two of the thirty used FMT, the other twenty-eight having decided presumably that FMT was more trouble than it was worth for translation purposes. However, eight of the thirty did use it to brainstorm ideas.

2.1. FMT rankings: an under-researched area

There are only a tiny handful of studies which rank FMTs such as *Google Translate* and *Babelfish*, etc, in the form of non-academic articles or blogs. This is surprising since there is a need for a ranking system for the reasons explained in section 1.1. Moreover, most of the current rankings are unsatisfactory, mainly because (i) most of them rank no more than four FMTs; (ii) do not indicate which FMT is most appropriate for a particular type of text (iii) do not explain the evaluation criteria in any meaningful way. Unlike the handful of studies cited below, our study includes ten FMTs —the minimum number (perhaps) for a ranking, explains which FMT is suitable for which linguistic feature(s) in a text and our evaluation criteria are explained in detail.

As far as FMT ranking is concerned, Savoy and Dolamic (2009) rank three FMTs. They evaluate a total of 117,452 documents from French to English and conclude with the following FMT ranking: 1st *Google Translate*, 2nd *Babel Fish*, and 3rd *Prompt*. They note problems for *Google Translate* with lexical ambiguity, case sensitivity and idioms which are translated word for word. Thiele ([19] 1999) evaluates one FMT with two documents translated from German to English. He notes that automatic translation greatly simplifies the production of foreign language text. Whether a professional translator would agree with this view, given the high number of professionals that do *not* use FMTs is a matter of conjecture. Techscribe evaluates one FMT, *Google Translate*, by means of one article translated from English to Spanish and then assessed by sixty human translators. Approximately half of these professional translators i.e. thirty out of sixty rated the translation in the «excellent» category. The makeuseof.com team rated five FMTs on translations for an introduction to a short story from Spanish to English: 1st *Google Translate*, 2nd *World Lingo*, 3rd *SDL*, 4th *Free Translation*, 5th *Yahoo Babel Fish*. Noop.nl translate a four line original text from Dutch to English and ranks four FMTs as follows: 1st *AltaVista Babel Fish*, 2nd *Google Translate*, 3rd *FreeTranslation.com*, 4th *Dictionary. Com Translator*.

3. Methodology

In order to look at this under researched area, our small scale evaluation has been carried out based on key criteria such as the round trip technique, targeted sentences, fidelity and clarity. In the first place, we follow Aiken's lead (2009) and use «round trip» technique (RTT) which is English > Spanish > English. In other words, a round-trip translation is the process of translating a text into another language and then translating the result back into the original language. Yates (2006) criticizes the «round trip» methodology on the grounds that it makes things easy because all the evaluator has to do is compare the final translation with the original text. However, we consider that the advantage of such an approach is that it makes the evaluation process transparent. Somers (2005) states that the problem is that the evaluators cannot tell if the errors occurred during the passage to the target language or return passage to the source language. For this reason, according to Somers at least, RTT is a tendentious technique. However, (a) a cursory look at our data show that the evaluators would be able to tell at what point in the RTT the mistakes were made, (b) even if evaluators could not tell when errors occurred we do not see why this should make RTT tendentious, (c) official organisations such as *The Health Educational Council* use RTT to check the quality of the work they have commissioned.

Like Amigó *et al* (2006), we favour a qualitative evaluation based on the Human Likeness Approach (HLA) defined by López and Roca (2006). This way of evaluating translation quality requires human evaluators to judge each translation by using applied linguistic criteria (such as clarity and fidelity) to assess a text on its own merits.

Our version of the HLA methodology is based on two applied linguistic concepts: clarity and fidelity. Clarity is defined as «the ease with which a reader can understand the translation» (Fiederer and O'Brien, 2009). Clarity is synonymous with intelligibility, comprehensibility or what is understandable. Simply put, the less the evaluator understands, the lower the quality of the translation. Fidelity is defined as «the extent to which the translated text contains the same information as the original» (Fiederer and O'Brien 2009). One other major difference between the studies carried out up to now and our own is that each of our sentences is **targeted** to test a specific feature of a language. That is to say, each sentence tests the free online translators ability to translate a particular element in the language such as a phrasal verb or a lexical ambiguity. Table 3 below indicates which sentences were used to test five different features.

To rate the quality of the *Google Translate* and *Reverso* translations which used a scale of 5 (best) to 1 (worst) for clarity (see table 4).

However, where fidelity is concerned, we have chosen to deduct points rather than add them. Therefore if the text is in perfect English but does not convey the meaning of the text at all, we deducted 5 points. If the translation conveyed the meaning of the source text then we would not deduct any points. i.e. 0 points (see table 5).

However, in no case did we deduct marks in practice from the translations for lack of fidelity.

Table 3. Five kinds of targeted sentences

1	Idiom	A rolling stone gathers no moss
2	Formal (Biblical language)	For the truth's sake, which dwelleth in us, and shall be with us for ever
3	Lexical ambiguity (e.g. striker at a factory or in a football team?)	Strikers and union officials met at the factory reach an agreement
4	Phrasal verb	How can we get around this problem?
5	Grammar (Subject verb object [SVO order])	He persuaded her to come to the office with him

Table 4. Evaluation criteria: clarity

Points	Descriptor
5	The text is clear and does not require corrections
4	The text contains minor errors
3	The meaning of the text is reduced to «gist» but is understandable
2/1	The text is barely comprehensible
0	Complete gibberish

Table 5. Evaluation criteria: fidelity

Points	Descriptor
-5	The translation does not convey the meaning of the text at all
-3	There are nuances missing
0	The translation conveys the meaning of the text

After performing RTT on 5 different targeted sentences (from English to Spanish and then back to English), we asked a small team of five professional translators to assess the final text in English produced by the ten FMTs for clarity and fidelity and come to an agreement on a mark out of 5 for each sentence. The marks were then calculated to assess the quality of the FMTs in six different ways: total aggregate, idioms, formal register lexical ambiguity, phrasal verbs and «grammar» (word order).

4. Findings and results

We now present a comparison between the results for *Google Translate* (see table 6) and *Reverso* (see table 7) using the methodology explained in part 3.

Table 6. Results for *Google Translate* FMT

1. Source text in English	
Idiom	A rolling stone gathers no moss
Formal register	For the truth's sake, which dwelleth in us, and shall be with us for ever
Lexical ambiguity	Strikers and union officials met at the factory to reach an agreement
Phrasal verb	How can we get around this problem?
Grammar	He persuaded her to come to the office with him
2. Source text translated in Spanish	
Idiom	Una piedra que rueda no musgo
Formal register	Por el amor de la verdad, que habita en nosotros, y estará con nosotros para siempre
Lexical ambiguity (delantero/huelgista)	Los huelguistas y los dirigentes sindicales se reunieron en la fábrica para llegar a un acuerdo
Phrasal verb	¿Cómo podemos solucionar este problema?
Grammar	Él la convenció de ir a la oficina con él
3. Spanish text translated back into target text in English (Round trip completed)	
	Points/5
Idiom	A rolling stone no moss 2/5
Formal register	For the love of truth, that dwells within us, and be with us forever 4/5
Lexical ambiguity	The strikers and union leaders gathered at the factory to reach an agreement 4/5
Phrasal verb	How can we solve this problem? 5/5
Grammar	He convinced her to go to the office with him 5/5
	Total 20/25

From the data above, we can compare *Google Translate* (*Google*) and *Reverso* in five separate areas: idiom, formal register, lexical ambiguity, phrasal verbs and word order.

Sentence 1: Idiom

Reverso scores higher on idioms than *Google* because the *Google* translator misses the word *gathers*. *Reverso* translates the idiomatic expression perfectly and therefore scores 5. *Google* misses a word and thus scores 2 points.

Table 7. Results for Reverso FMT

1. Source text in English		
Idiom	A rolling stone gathers no moss	
Formal register and	For the truth's sake, which dwelleth in us, shall be with us for ever	
Lexical ambiguity	Strikers and union officials met at the factory to reach an agreement	
Phrasal verb	How can we get around this problem?	
Grammar	He persuaded her to come to the office with him	
2. Source text translated in Spanish		
Idiom	A la piedra movediza nunca moho la cobija	
Formal register	Para el bien de la verdad, cuál dwelleth en nosotros, y estará con nosotros para siempre	
Lexical ambiguity (delantero/huelgista)	Huelguistas y responsables sindicales encontrados en la fábrica para alcanzar un acuerdo	
Phrasal verb	Como podemos ponernos alrededor de este problema?	
Grammar	Él la convenció de venir a la oficina con él.	
3. Spanish text translated back into English. (Round trip completed)		
		Points /5
Idiom	A rolling stone gathers no moss	5/5
Formal register	For the good of the truth, which dwelleth in us, and it will be with us forever to	3/5
Lexical ambiguity	Strikers and syndical persons in charge found in the factory to reach an agreement	2/5
Phrasal verb	Like us can we put about this problem?	0/5
Grammar	It convinced her to come to the office with it	2/5
	Total	12/25

Sentence 2: Biblical language with a formal register

We see that *Google* does better than *Reverso* on formal language. *Google* translates the Biblical language almost perfectly i.e. «For the love of truth, that dwells within us, and be with us forever» scoring 4 out of 5 points whereas *Reverso* translates the end of the sentence confusingly as «forever to» scoring 3 points.

Sentence 3: Lexical ambiguity

The third sentence shows that neither *Google* nor *Reverso* confuses strikers in the factory sense with the football sense. *Google* translates the lexical term «union

leaders» correctly (4 points) whereas *Reverso* translates the phrase as «syndical persons» (2 points).

Sentence 4: Phrasal verbs

In the original sentence, the phrasal verb is «get around (a problem) and this is much better rendered by *Google* with «solve» (5 points) than the *Reverso* «put about» (0 points) which makes no sense.

Sentence 5: Grammar

Though both *Reverso* and *Google* maintain the correct word order (SVO, subject verb object) in the fifth sentence, the *Reverso* translation is marred by the use of «it» instead of «he» as the subject pronoun and again the use of «it» as the object pronoun instead of «him». In this fifth sentence, therefore *Google* scores higher (5 points) than *Reverso* does (4 points). Now that we have provided a practical example of the way we evaluated the translations we now look at the results for ranking of the «Top Ten» free online translators by evaluating an English to Spanish to English «round trip» translation.

From table 8 below, we can see that *Google Translate* scores maximum (20/25) on *total aggregate* and that *Webtrance* scores nothing (0/25) and languishes at the bottom of the ranking. However, an examination of the targeted sentence shows a pronounced effect on the ranking order. For example, *Google Translate* does less well when translating *idioms* like «a rolling stone gathers no moss». Therefore our findings are that though *Google Translate* translates most accurately of the ten for non-specialist texts, users would be advised to use *Babylon*, *Reverso*, *Babelfish* or *Bing* instead of *Google Translate* for texts with a high incidence of *idiomatic* expressions. For *formal register* although *Google* is at the top once more, lower positions are occupied not by *Bing* but *Reverso*. Thus our findings are that after *Google Translate*, users would be advised to use *Systrans* rather than *Bing*. For *lexis* top positions are held by *Babylon* and *Bing*, for *phrasal verbs* by *Babylon* and *Bing* and for *grammar* by *Prompt* and *Reverso*. In general terms, the user needs to look at high incidence features (e.g. *idiom*, *formal register*, *lexis*, *phrasal verbs* and *grammar*) in the text to choose the appropriate FMT for his/her purposes. By and large, if *total aggregate* constitutes a ranking for the «best» translator, then *Google Translate* is the best of the ten (see table 8).

5. Discussion and conclusions

We evaluated and ranked online machine translators, which are available on Internet and free of charge to the general public, for the quality of their target text translations from English to Spanish and then from Spanish to English. Some FMTs are so alarmingly poor that the gist of the source text gets «lost in translation». In other cases, the quality is surprisingly high. Our multi-ranking approach evaluates the ability of a FMT to translate not only standard sentences but also specialised linguistics.

Table 8. Total aggregate score: Global Internet Ranking Results for FMTs

Translator	Rank	Total	Idiom	Register	Lexis	Phrasals	Grammar
Google	1	20/25	2/5	4/5	4/5	5/5	5/5
Babylon	2	16/25	5/5	1/5	4/5	5/5	0/5
Reverso	3	13/25	5/5	3/5	2/5	0/5	2/5
Bing	4	12/25	4/5	1/5	4/5	4/5	0/5
Babelfish*	5	11/25	5/5	2/5	1/5	2/5	1/5
Systrans	6	9/25	5/5	2/5	1/5	2/5	0/5
Prompt	7	8/25	0/5	1/5	2/5	0/5	5/5
Worldingo	8	4/25	0/5	1/5	1/5	2/5	0/5
Intertran	9	2/25	1/5	0/5	1/5	0/5	0/5
Webtrance	10	0/25	0/5	0/5	0/5	0/5	0/5

* Yahoo version.

tic features. For example, we see that *Google Translate* ranks highest on translating sentences with a formal register while *Babylon* outperformed *Google Translate* on idioms. However, there are still no set standards or benchmarks in the literature to evaluate the quality of FMTs. Nonetheless, taking into account the tentative set of benchmarks we can state that the differences in FMT positions in a ranking depends on the type of text being translated. For example, whilst Google is at the top of the ranking for total aggregate score it is in fifth position (ranked 3rd) on idiomatic expressions. Therefore users should decide which FMT to select based on the kind of text they wish to translate. That said, there is a general pattern for all rankings in the study. On virtually all rankings *Google Translate* is generally in the top two positions. *Webtrance* and *Intertran* are invariably in the last two positions. *Reverso*'s performance is highly erratic; 3rd on aggregate; 2nd on idioms; 8th on phrasal verbs.

In summary there are two key conclusions that can be made of the basis of our study. The first, with the aid of a multi-ranking system, users can use the FMT which suits their purpose. Some FMTs are better at translating idiomatic expressions and others at formal register. Therefore, it is not always Google Translate that should be used but rather the user should choose a FMT according to the type of source text to be translated. Secondly, given the lack of consensus as to reliable evaluation benchmarks, there is a need for to develop them in the near future.

6. Limitations of study and further research

In order to improve the quality of the translation produced by machine translators, research needs to be carried out to provide empirical data based on a larger set of different parameters. Our study is limited in at least three ways: the number of FMTs could be larger i.e. more than ten; more language could be analysed using the round trip approach, not just English - Spanish - English; each FMT could be

intra-ranked for ranking of non-English languages supported by the FMT. This study has identified key areas which are relevant to FMT technology. Some of the questions we raised regarding research and development may serve to enhance FMTs, thus ensuring that the quality of the translation they provide free of charge and on-line is improved in the future.

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