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Machine Translation - a view from the shop floor

Steve LANDER

Zusammenfassung

Nach Besprechung von Basisverfahren in der Übersetzungspraxis werden die Gründe untersucht, warum die maschinelle Übersetzung im grossen und ganzen wenig zufriedenstellende Resultate erzielt hat. Die Entstehungsprozesse für Originaltexte sowie übersetzte Texte werden verglichen und es wird die Schlussfolgerung gezogen, dass sie sich in nur wenigen Aspekten unterscheiden. Anschliessend wird eine bestimmte Textart ("Oh, God, Not One Of Those Again" - OGNOOTA) beschrieben, mit der die maschinelle Übersetzung doch einen gewissen Erfolg aufweisen kann. Auch Originaltexte dieser Art scheinen für die automatische Erzeugung geeignet zu sein und es wird daher nahegelegt, dass Hersteller von maschinellen Übersetzungssystemen vielleicht mehr Erfolg hätten, wenn sie sich auf allgemeine Texterzeugungssysteme konzentrieren würden, die auch in der Lage wären, Texte in verschiedenen Sprachen zu erstellen.

Basic processes in translation

I would like to begin by looking at the basic processes involved in translation. Translation begins with a Source Text (ST) and finishes with a Translated Text (TT). The steps in between probably look something like this for most translators:

1. Create a first draft of the TT.¹
2. Check and revise this first draft with constant reference to the ST. This is something that can be done by another translator, and if it is done sensibly, quality can be greatly enhanced.
3. Polish up the TT such that it can be regarded as an acceptable text in the target language.

Where could MT fit into this process?²

Even the producers of MT systems now concede that their products can really only help at stage 1 of this process, *help* being the operative word, as no MT system can produce a first draft that is as good as one produced by human translation (HT). Producers of MT systems hope that the MT system's first draft will lead to an enhancement of quality such as can occur if another translator

¹ My practice is to try to clarify all unknown terms and unclear meanings at this stage. As a staff translator, I have the advantage of easy access to experts and probably the author of the ST, and can usually clear up any questions with them. I almost always have questions about a text, unless it is very short, ie there are virtually no texts which are completely clear from start to finish. The implications of this for Machine Translation (MT) cannot of course be ignored.

² For the purposes of this present paper, MT refers to so-called Fully Automated Translation (FAT) rather than Computer Assisted Translation (CAT). CAT covers such aids as terminology management systems, term-finding tools etc, whereas FAT purports to produce an actual draft TT.

revises the first draft (SLOCOM 1985); but stage 2 for a draft TT produced by a machine always involves more work and time than for one produced by a human, and this might well kill off any chances of enhanced quality. Quantitatively, however, the lost time at stage 2 might be (more than) compensated for by the machine completing stage 1 in far less time. This is indeed the major selling point for MT systems.

Possible gains in time are not the only criteria in the balance sheet between MT and HT, though. For instance, there is the cost of purchasing and maintaining the MT system, which is certainly not cheap. "Maintenance", of course, includes vocabulary input and probably other software-related activities too. An MT system has to improve productivity enormously before it begins to pay for itself.

Given that, it is perhaps surprising that the main impetus for MT comes not from translators but from administrators and managers of translation departments, who are often not translators themselves or ever have been. This is something I have observed myself, and it has been confirmed by BERNHARD (1994), who also found that managers tend to evaluate the success of the systems more positively than do the translators who have to operate the system. Support from the buyers of MT thus seems to emanate mainly from those who are not directly confronted with the problems of using it, a curious development which producers of MT systems surely ought to find an explanation for. Especially as, according to Bernhard, the majority of MT users, translators and administrators alike, are largely dissatisfied if not totally disenchanted with the MT system they have purchased. Why have MT systems experienced such a significant lack of success among those at the interlingual coalface?

Reasons why MT largely fails

There are, I think, some very fundamental reasons why MT systems have been so unsuccessful. Perhaps the most elementary is the often unspoken presupposition that the ST is readily available in electronically readable form. While more and more STs are available on disk, by no means all of them are: I am a staff translator in a large company where most of the STs are generated internally and electronic office equipment is commonplace, but I estimate that only around half of the ST material is available electronically. Some texts, for example, are produced using systems incompatible with my own, others are posted or faxed from other parts of the world and it is simply not worth the trouble in many cases to try to get them in electronic form, and others come

from other companies and organisations. How much worse would the situation be for freelance translators?

MT also presupposes good, error-free quality in the ST. I mentioned before that I nearly always have questions about a text of any length; it can never be assumed that an ST is completely clear and unambiguous. Typing and other kinds of errors can easily incapacitate the system too; in this case, an MT system may help in finding errors in the ST, but it does not help the translation process much. For the same reason, scanners with OCR facilities are of limited use for texts not available in electronically readable form: none of them is 100% error-free, and having to check the ST over for such errors before putting it through the MT system will probably eliminate any savings of time etc that the MT may bring.

The page layout, text formatting and so on are also lost by many MT systems, especially the more expensive ones (somewhat paradoxically). TTs should usually have the same layout as STs, and there are occasions when the opportunity to take over the formatting of the ST directly is a great time-saver, as SHIPTON (1989) has pointed out. Assuming that saving time is one of the major reasons for buying an MT system in the first place, then any time the system loses must be chalked up on the debit side.

One of the purposes for which it is claimed MT can be used without pre- or post-editing is for "information" to experts in the field, to enable them to decide, for instance, whether they need a proper translation of the ST. However, from my experience of MT systems, they cannot be trusted at all without checking. I once ran an experiment with SYSTRAN where the machine translated from German to Spanish via English, the only way it could manage the German-Spanish pair at the time. At some point in this process, a "not" disappeared from one of the sentences, resulting in the Spanish saying precisely the opposite of the German sentence! When such things occur it makes you hesitate to recommend MT even for mere "information purposes".

As has been said, an MT always requires post-editing, far more so than a draft TT produced by HT. If, however, the TT has to be checked carefully against the ST for accuracy and linguistic quality, then the lion's share of the work involved in HT still has to be done. The translator or post-editor still has to read the original and understand it, and must still look up any terms not known, for the machine cannot be trusted to have got them right. The MT text has to be examined to see whether the ST has been accurately translated, and whether any improvements to the linguistic quality of the MT text can be made. This latter implies that the post-editor has already some kind of "ideal translation" in mind with which to compare the MT effort. How much more is involved in translating

from scratch than understanding the ST and formulating an "ideal translation" which is then written down, probably for revision and improvement later? In the worst case, all that the MT system will do is save the translator cum post-editor some typing work, which might be cancelled out anyway by the corrections that have to be made to the MT text. It may not even dispense with the need for "later revision and improvement", since it may be necessary to revise and improve the translator's first attempt at an "ideal translation" at a later stage, if the MT effort is particularly bad.

Evidence that MT texts have to be scrutinised in every detail comes from a test carried out using the LOGOS system to translate reports of managerial staff movements within a company from English to German. As might be expected, the word *Iheadf* (of department) occurs very regularly in this type of document. On its first try, without vocabulary input, LOGOS translated "head" as "Kopf", which is to say the least a very unusual German term for this meaning. By far the more common term is "Leiter", and "Kopf" was judged unacceptable in this context. Vocabulary input to the system corrected this and other errors, and then the translations were better; however, it was clear that the first MT draft had to be examined very carefully for inadequacies of this nature, for the machine did not mark them in any way. As far as LOGOS was concerned, if a translation for a particular term existed in its dictionaries then that was the correct translation for all contexts until it was told differently (though I would not care to hazard a guess as to what the "corrected" system might then have made of a text about managers of brain surgery departments).

It is of course one of the truisms of information technology that it is never worth writing a program that will be used only once. Programs are only worth writing if they can be used again and again. Vocabulary input and other preparatory activities for MT are rather like writing a program (and the MT system is acting rather like a programming language in this case), and so it is only worth doing if it is going to be useful for a good number of texts.

Machine Translation that (almost) works

Despite its myriad failings, I would not deny that there are circumstances where MT can bring benefits in the form of enhanced productivity and quality. The most obvious are perhaps the possibilities of taking over formatting, tables, diagrams etc directly, and more consistent translation of technical terms, though a fully-fledged MT system is not actually necessary for any of these. The extent of the benefits here also does not in most cases warrant a lot of trouble chasing up the electronic form if it is not immediately available in a suitable format.

MT may offer other advantages too under certain circumstances. The Canadian meteorological service is already using an MT system (known as TAUM-METEO) to produce bilingual weather reports, for instance, which has apparently proved immensely useful (CHEVALIER et al 1978; CHANDIOUX and GUÉRAUD 1981). I have written simple MT programs, basically search-and-replace routines, to automate the translation of analytical methods for chemicals and the above-mentioned reports of managerial staff movements within the company I work for. The programs brought considerable increases in productivity as far as the translation of these particular documents was concerned; but the documents have certain crucial characteristics. As well as being repetitive and dealing with tightly-defined domains, they contain a great number of tables, figures, dates, names etc which can be taken over more or less as they are from the ST. Together with the ready-made text formatting, this all adds up to considerable advantages in automatic processing aimed at translation³. The advantages only accrue with the translation of these particular documents, however; using the programs with any other kind of document is of very little use. The machine's efforts at translation still need to be checked over thoroughly as well, whatever kind of document is translated.

Production of Source and Translated Texts

Why should some texts be amenable to MT and not others, and how can the amenable ones be identified? The answer to this, I think, lies in questions fundamental to the production of all texts. It often seems to be assumed that translation is not really text production at all in the proper sense of the term, since the text (the ST) already exists; this point of view sees translation as some sort of text **conversion** rather than production. This is how MT (and also some non-translator managers of translation departments) have tended to see translation, and I believe it to be a serious and fundamental misconception.

From my experience as both a translator and a writer of original texts, I analysed the processes involved in producing both kinds of text. They turned out to be remarkably similar. The two processes can be characterised as follows:

³ In the case of analytical methods, the chemists who wrote the STs had to agree to use the same phraseology in every case; before, some had always expressed themselves differently from others even though they were talking about exactly the same process. The eventual solution involved the preparation of style sheets (templates) containing the standardised text - which could be regarded as a kind of pre-editing for MT purposes, rather along the lines of "simplified language" that some organisations are trying to introduce for their documentation, *inter alia* with a view to subsequent translation by machine.

Source Text

- 1 Decide what you want to say (with the aid of reference materials like textbooks, research reports, encyclopaedias etc, if necessary)
- 2 Decide how to say it (with the aid of reference materials if necessary)
- 3 Revise the text to eliminate errors etc
- 4 Perhaps give the text to others for their opinions and revise it further in the light of those opinions
- 5 Regard the text as finished and use it for the purpose for which it was produced.

Translated Text

- Decide what the author of the ST wants to say (with the aid of reference materials like dictionaries, encyclopaedias, textbooks, research reports etc)
- Decide how to say it (with the aid of reference materials if necessary)
- Revise the translation to eliminate errors etc
- Perhaps give the translation to others for their opinions and revise it further in the light of those opinions
- Regard the translation as finished and use it for the purpose for which it was produced.

The sequence of these stages is not of course in any way absolute or rigid; overlap, blurring, jumping back and forth and so on can quite easily occur, perhaps most probably with error elimination, which could well take place at any stage of the process, including when the text is actually in use. Nevertheless, I think these stages do represent real steps in the text production process that most if not all texts go through in one way or another.

According to this model, the only real difference between ST and TT production is that instead of deciding what they want to say themselves, translators decide what somebody else wants to say. All the other stages in the process are more or less identical. For a translator, the **content** of the text is more or less already given, but the articulate **expression** of that content still has to be created or formulated. It is thus still necessary to **produce** the text in a very important sense of the term.

Does this mean that it takes as much time to complete a translation as it does to complete an ST? Occasionally, it can do, but the TT is usually produced in a shorter time. The development of the content and related ideas is a matter which can take considerable effort, and if this has already been accomplished then the production of the text will probably take up correspondingly less time. On the other hand, the formulation and expression of a complex, varied, and original content demands greater thought, care, and deliberation than does that of a simple, repetitive, or standardised content. This indeed seems to be crucial in identifying those texts which are most suitable for MT: for it appears that the

kinds of texts which are most amenable to MT are those where it is less difficult for ST authors to decide what they want or have to say - repetitive texts, often written mainly to satisfy regulations, dealing with a sharply defined subject area etc. What the author needs to say has largely been decided already, and probably by somebody else.

The difficulty in producing such texts lies not so much in deciding what to say, for the intellectual effort involved is probably minimal; the problem lies far more in generating enough enthusiasm to get them written at all, for they offer little of interest to the writer, and often little enough to the reader too⁴. It seems to me that an effective test of suitability for machine translation is the reaction a text evokes from the translator when it is received: if this is something along the lines of "Oh God, Not One Of Those Again!" (OGNOOTA), then the text is probably a good MT candidate⁵.

OGNOOTA texts are also the kinds of texts which I can imagine might well be generated by computer themselves, putting the ST author in the same position as the translator vis-à-vis machine translation. It might not be possible to generate original texts on purely formal criteria such as the search-and-replace translation routines I talked about earlier, but as soon as more than the purely formalistic is involved I can imagine that the programming problems are likely to be of a complexity comparable to those of creating MT systems. Could it be that, for all practical purposes, automatic translation is only as easy to achieve as automatic generation of STs? Considered from that angle, MT does not seem anything like the simple matter it may appear from the "text conversion" point of view, and I would suggest that it is a far more suitable perspective on the whole exercise. Indeed, it may even be that "automatic translation", insofar as it is possible at all, will turn out to be superfluous - if a machine can generate text in one language, it can in principle generate it in another. What would then arise would be not so much translation as simultaneous multilingual text generation by computer⁶.

⁴ To quote Samuel JOHNSON, "What is written without effort is in general read without pleasure."

⁵ This is supported by SLOCUM's (1985) account of how the Canadian weather report MT system TAUM-METEO described earlier began: it was due to "a chance remark by a **bored** translator" (my emphasis), and at the time when the translations were done exclusively by humans, it was "so monotonous a task that human translator turnover in the weather service was extraordinarily high - six months was the average tenure."

⁶ SOMERS & JONES (1992) describe a multilingual text generation approach, though this is interactive rather than fully automatic in nature.

Conclusion

Among other problems, MT systems suffer from a fundamental misconception in their whole design. MT systems are most suitable for Source Texts which are devoid of interest for writers and probably readers as well, and which could probably be generated almost as well by computers themselves, with a minimum of human intervention. The more a text moves away from this type, the less suitable it is for MT, and a threshold is soon reached where it is no longer sensible or profitable to use MT. The differences between translation and source text production are nowhere near as great as is sometimes supposed, and the recognition of that leads to a far more realistic perspective on the inherent difficulties of Machine Translation. Indeed, rather than attempting to create MT systems, manufacturers of information technology might be a good deal better advised to look for more general text production systems which could then generate texts in different languages if desired.

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