

## Introduction to interactive translation

*Russell Bateman*

*English-French Project Manager, Automated Language  
Processing Systems, Provo, Utah, USA*

*The rationale behind the ALPS interactive approach to  
machine translation is explained, and its advantages are  
illustrated.*

### THE ALPS IDEA

For some thirty years high-speed automatic translation by computer has been a dream sought by academic research groups and commercial ventures ranging from the serious to the opportunistic. During this time, many theories and systems have briefly seen the day only to melt before the enormity of the task.

Early projects set out to achieve fully automatic translation and, of course, high were the expectations for good-quality output. Almost nothing was realised of these expectations, save it be in some limited areas where terminology and linguistic structure were highly predictable. Most projects, however, underestimated both the complexity of the task and the processing power required. The user interface problem was nasty at best until recent innovations in the workstation concept, word processing software and interactive techniques made a partnership between translator and machine reasonably acceptable.

With over ten years of success and failure alike in an academic research environment, plus four years of commercial activity, Automated Language Processing Systems (ALPS) is now producing a range of practical translator aids; this, even though the perfection of fully automatic high-quality machine translation seems a remote possibility.

We believe that anything the computer can do to

provide an environment to speed the translator's work fulfils the definition of an aid to translation. While automated language processing remains in its infancy and is unable to decipher the structure in many types of text, there are some types which can be accurately translated by machine using the translator to greater (interactive translation) or lesser (automatic translation) degree. The amount of revision required will depend on the quality and style desired. It can be argued that in view of the millions of words that need translation but go untranslated each year in the commercial world, a lesser degree of quality can be tolerated for some materials.

On the other end of the spectrum, documents such as contracts and publicity brochures, advertisements, etc. have needs ranging from a highly faithful to a completely original effort on the part of the translator. The machine cannot now, without the heavy use of time-costly artificial intelligence techniques, provide much linguistic processing beyond simple inflection and agreement. It becomes, when thus misused, more of a detriment and very often more of an insult to the qualified translator than a help. It is indeed unfortunate to hear a user complain about having to wait for the machine to finish translating so that he/she can then get on with the real business of translation - the machine's copy being utterly worthless to the translator.

It is in recognition of this fact that ALPS has created a set of translator aids that purport to be user-friendly and that cover the entire range of needs as we perceive them: from interfacing with input devices such as optical scanners and widely varying magnetic tape and disk formats, to formatted output to the printer, phototype setter, etc. It is in further recognition of this that ALPS has determined that except for limited texts such as parts lists, tables of contents and the like, we will not attempt automatic or batch-type processing.

## THE ALPS PRODUCT RANGE

The ALPS range of product offerings, mentioned by Merle Tenney elsewhere in this publication, therefore includes a high-quality and high-power multi-file word processor including all the basic and extended formatting abilities necessary for printed output, coupled with both selective and automatic dictionary lookup capabilities and a flexible interactive translation system.

## NOTES ON ALPS INTERACTIVE TRANSLATION

It is the main purpose of this paper to reveal the reason, the thought and the substance behind the peculiar ALPS interactive process. I say peculiar, because among members of the MT community we alone employ the concept.

Why ALPS chose the interactive approach is evident from a historical and also from a technological perspective. Present hardware is too limited in memory, and more importantly in speed and cost, to permit more than rudimentary linguistic processing in real time. A translator, we feel, is best served by having the possibility of invoking a machine translation directly from the text in his/her word processor, immediately receiving a tentative rendering, and being able to provide his/her own version using as much or as little of the machine's work as desired. In addition, the interactive approach means that where necessary the machine will ask the translator to supply information as to terminology, style and structure of the source text. Most important, the creation and tailoring of dictionaries is tantamount to, and often means the difference between, success or failure of the system as a true aid to translation. In the ALPS system, the quality of the dictionary is directly related to the number of questions posed to the user during an interactive translation session.

The advantages of interaction in the machine translation process are twofold. First, is the leeway it permits in terminology and style while still ensuring a high degree of standardisation. Updating the dictionary 'on the fly' (directly during the translation process) is of utmost importance, because if an incorrect term is allowed to be proliferated throughout a document, the mere fact that it may be inflected to agree with other words precludes the possibility of searching and replacing the term with a better one on a textwide basis. Within a certain range, the translator may wish to vary terminology to create a more pleasing document, particularly in the case of repetitive adverbial structures. Secondly, a set of active switches allows the user to tailor the machine's way of handling grammatical processing of particular structures, which allows simple modification of stylistic features. An example of this is the capability the translator has to require the infinitive form for the imperative in translating a user manual from English to French.

Linguistically, interaction is of great use to the system. It helps to fill the gaps in syntactic processing when ambiguous or very complex structures are encountered. For example, it resolves ambiguous noun phrasing so that the output from the machine may better benefit the translator by enabling the computer to perceive the hypotactic relationship

between nouns in the group (that is, what depends on what). It does this by asking a simple question presenting the actual elements of the phrase with differing hypotaxis, two or three ways. Examples:

1. I want... some wine and Brie cheese.  
Is the text speaking of 'some wine cheese'?
- I bought... some wicker and rattan furniture.  
Is the text speaking of 'some wicker furniture'?
2. Dr Seuss is a... green eggs and ham enthusiast.  
Is the text speaking of 'green ham'?
- I prefer... green peas and carrots.  
Is the text speaking of 'green carrots'?

The questions are not irksome and the user may skip a sentence's processing any time he/she feels that it is beyond the machine's capabilities. This capability would be sacrificed in a system which does not halt between sentence or paragraph boundaries or at the user's desire. It therefore helps to translate the document requiring translator intervention. But when a document needs so much intervention that the machine hinders the translator (too many questions or too much post-editing), we feel that the choice of aid has been incorrect and the translator would be better to use another level of aid (see M. Tenney's remarks).

For appropriate documents, when the dictionary is well stocked but without terms and renderings unnecessary for the document in question, the interactions will rarely exceed a couple of terminological selections and one or two questions on ambiguity or different phrasing per sentence. The degree of interaction is controlled, on one hand, by the number of possible translations for a given term, and on the other, by the nature of the text. For example, in French-source technical text, the inherently fewer grammatical hiatuses produce fewer interactions of this last type than the reverse process.

The future of interactive translation at ALPS is assured as long as machines remain incapable of reason, though it will undergo considerable metamorphosis and refinement. When we began development four years ago, interaction often served to overcome inadequacies in the area of processing power. As hardware became more powerful and inexpensive, we were able to concentrate more on the business of linguistic processing. In the future, through systematised lexical aids, improved data structures and advanced syntactic and semantic processing, we expect to overcome all but the most complex linguistic problems remaining. Indeed,

the range of texts amenable to machine-assisted translation will increase, and the help that the system provides will enable more texts to be translated than ever before.

**AUTHOR**

Russell Bateman, English-French Project Manager, ALPS, 190  
West 800 North, Provo, Utah 84604, USA.