

EXPECTATIONS FOR MT
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I am very happy to be here with you today, and it was indeed an honour to be invited to participate in the activities of the International Forum for Translation Technology. Computerized translation is a fascinating concept, but one that is difficult to define. I am therefore going to leave the theoretical debates to the theoreticians, and share with you some far more practical thoughts based on our experience.

In the 1950s, scientists proclaimed to anyone who would listen that robots were the tools of the future, tools which would free workers from tedious chores and guarantee factories an inexhaustible labour force. Although they have not lived up to this promise, we must acknowledge in their defence that robots can now paint cars and assist in brain operations. There has been enormous progress in the field of robotics over the past thirty years, even if there are still no R2-D2s or C-3POs, the celebrated archetypes of Star-Wars.

The evolution of machine translation has been similar to that of robots. The concept of automatic translation has developed as knowledge about artificial intelligence has grown. Most of the commercial systems that have been tested for machine translation were the product of the technology of the 1970s. These systems generally require the following steps:

- Pre-editing of the text so that the system can decode it as necessary;
- dictionary modification;
- post-editing of the translated text.

The need for pre-editing is a sure sign that such systems are unintelligent and are incapable of producing a good translation without human assistance. Nevertheless, applications have been found for this 1970s technology, in spite of its lack of sophistication. One fine example is the METEO system that has been used by Canada for more than ten years. Since 1977, METEO has translated about 15 million words per year from English to French without significant human intervention; beginning April 1989, it will translate from French to English as well.

But you want to know how I see machine translation today. You want to find out if machine translation is still a possibility, and what is to become of the translator, whom we have always thought irreplaceable. Is translation as a profession to become a thing of the past? These are the issues that I want to discuss with you today.

Because of advances in artificial intelligence, achieved in part through progress in related disciplines such as pure linguistics and mathematical logic, we have changed our concept of system intelligence. For years, in our effort to produce intelligent programs, we relied basically on the computer's ability to do calculations at very high speeds. This means that the problem-solving capability of computer programs depended above all on persistence. All possible hypothetical solutions were simultaneously considered and an attempt made to determine which one was most plausible. This continued until either success was achieved or the computer reached a dead end.

Today, for a system to be considered intelligent, it must be capable of learning. In translation, learning involves more than just storing, filing and retrieving information.

Learning also means:

- correcting errors on the basis of experience;
- integrating information to create new knowledge by inference;
- inferring from the context, so that in the statements "He understood my instruction because he followed it" and "I follow instructions without trying to understand them," "understand" has two different meanings. In the first case, it means understand what has been asked; in the second, it means understand why it was asked;
- flagging ambiguities using information given in the layout.

There is no system in existence with enough intelligence to use common sense. In the present state of knowledge, such an objective is for the long term. But should science be so modest that it will not set goals for the distant future? No indeed, especially since the pursuit of such objectives can promote a profound change in our ideas and open the door to possibilities that seem unimaginable today. The ultimate objective is the creation of a truly automatic translation systems.

Today, we, the practitioners, may still choose only between

- general systems, which require significant human intervention to be usable;
- and specialized systems with a high level of knowledge in their very limited subject areas.

Unlike those of the 1970s, these systems do have a limited amount of intelligence, that is confined to a comprehension of text syntax. These are useful systems, if not very intelligent. While science continues to push back the frontiers of artificial intelligence, on which advances in machine translation depend to a large extent, the demand for translation is growing, as are the costs.

How can we reconcile the need to find an immediate solution to the problem of the increasing demand for translation and the associated costs, and the futuristic nature of the solutions proposed by machine translation research?

The automation of management tasks has led to a shift from a high level of centralization to the reappropriation by managers of the tools of their work. The same must happen in translation. From now on, translators must have computerized tools to assist them in their work. To do this, we must establish a field of application, computer-assisted translation, and use the by-products of research on artificial intelligence and automatic translation. We have concluded that, just as robotics has progressed from the dream of an all-powerful robot, capable of doing an entire job, to task-specific applications, so must translation.

After defining its requirements with respect to computer-assisted translation and surveying the products available on the market, Canada decided to invest in a range of computerized tools.

Software for computer-assisted translation was chosen for lengthy scientific and technical texts. Texts to be processed with this software must be organized and written in simple language, that is, in short, clear sentences, above all with no ellipsis. The texts must respect the rules of the language. This software will be cost-effective only if there are enough texts for translation which meet these criteria. The most important step in translating a text using software for computer-assisted translation is post-editing, which accounts for 60% of the total translation time. The machine output can be corrected at this stage so that the target text clearly reflects the source text and respects the "genius of the language."

With regard to short texts or texts that do not fit these criteria, we are testing a translator's work station. This station will provide simultaneous access to various features that will facilitate the translator's work. From a single console, he or she will have access to word processing, a personal terminology file, the TERMIUM terminology bank, concordances, translation comparators, and dictionaries. The work station may be connected to an electronic mail network, which, in an environment where words are the stock in trade, would change the work configuration considerably. All the equipment and software used in this work station are available at reasonable prices.

Although the first prototype of the work station is ready to be tested, a second-generation work station based on recently developed techniques in artificial intelligence is being studied. Besides the functions already integrated in the currently available work station, this second-generation work station will provide machine-translation modules capable of producing high-quality translations in specific sub-fields. The concept of specialized machine translation modules was thoroughly tested in the METEO system, in terms of both performance and cost-effectiveness, and Canada therefore opted for a pragmatic approach. This approach recognizes Canadian expertise in automated translation tools and integrates the available equipment that can assist our translators.

Who is this silent and irreplaceable translator?

What does he or she think of these new tools?

How can these tools change his or her environment?

Those who practise translation have always seen it as an art. "These are not words we are translating," they say, "but ideas." And this has indeed been confirmed by the latest research on artificial intelligence and machine translation. Except for the introduction of the dictaphone and the word processor, there has been virtually no change in the tools of translation for decades. The breakthrough represented by computer-assisted translation systems has drastically changed not only the working methods of the traditional translator, but his or her very conception of the profession.

The advent of computer-assisted translation meant that the translation process was divided into distinct tasks. Until then, translators had always considered the process as a single entity. Also, before the introduction of computer-assisted translation, the process of translating a written text from one language into another was visible in the exchange of terms. This replacement of one term with another proved to be the task that was most readily automated. However, if word substitution can be easily accomplished with translation software, this does not apply to the transfer of meaning. It is still the translator's prerogative to solve the complex problems of semantics, stylistics, and specialized vocabulary, and he or she alone is also responsible for the whole translation process. It should be noted as well that computer-assisted translation systems require much more teamwork by people who are not necessarily used to it.

It is not surprising that translators faced with such radical changes have shown a certain amount of resistance. Besides this reluctance on the part of translators, there is also the unfortunately too widespread perception that the purpose of the new technologies is to increase production at the expense of the workers.

A survey of a large group of translators revealed

- that they want to continue to expand their knowledge,
- that they want to work in their field of specialization,
- that they want to produce high-quality translations, and
- that they want to retain their professional status.

If only translators realized it, automated translation tools will certainly help them to achieve their objectives. No doubt there will be some brief difficulties in adapting to these new tools - like growing pains. But those in other professions have adjusted to the change, so why not translators? More than one timid soul has been ;
won over already by the large body of information published on the various automated tools and by the dissemination of knowledge that was only yesterday the reserve of specialists.

For us, the keystone of the harmonious integration of the new technologies into translation is co-operation between the partners. On one hand, we have the translator, who is both the expert who will provide his or her knowledge to the computer-assisted systems and the user, since he or she will use his or her talents on the raw translation that is produced; on the other hand, we have the organization, which must meet the ever-increasing demand for translation at an

acceptable price.

Even though the plan to create artificial intelligence has begun to take shape only over the past thirty years, it must be as old as homo sapiens. The dream of having a machine capable of reasoning is on humanity's permanent list of fantasies, along with the dream of flying or of achieving immortality. We have at the very least arrived at the point where we can clearly distinguish what is now possible from what will not be possible for a very long time. Today, people are much more willing to talk of tools to assist translation than of completely automated translation. Generally speaking, the software programs currently on the market are useful, but we must not delude ourselves about their capability: they may have a limited or refined ability to comprehend, but their field of application is minuscule. Progress in artificial intelligence and machine translation is and will continue to be quite slow, but it will be steady, with respect both to technical improvements (more effective morphosyntactic analysis, more refined programming language) and to theory (method of representing knowledge, transfer procedure modelling). System planners are now concentrating on the ergonomic aspects of system design. Defining the man-machine interface, vocabulary selection, and the learning process are difficult problems that require interdisciplinary co-operation.

Does the interest surrounding the problems of representation and use of knowledge foreshadow a reorganization of the fields of discipline? It would be premature to say yes to this, but it is definitely a possibility. It is significant that this important convergence of areas of research that were initially far apart has occurred because of a question that is relevant to all of them - language. In fact, mastery of language has always been considered a touchstone of intelligence.

To help sustain us on the long road to the limits of the possible, the design of computerized translation systems, allow me to remind you that - unmanaged expectations may meet with user rejection in the end.