

# Machine Translation: Ten Years On. Where are the Users?

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## Abstract

Early attempts to process natural language by mechanical means or machines date back to the thirties of this century. The first machine translation applications are known from the fifties. In view of the long history of machine translation, it is rather strange that even in the mid-nineties this technology is used quite rarely in the daily work of translators. Based on eight years' experience as a user of machine translation (starting with LOGOS and changing to METAL), I will discuss the reasons why translators are still reluctant to use machine translation for their everyday work.

## 1 Introduction

Early attempts to process natural language by mechanical means or machines date back to the thirties of this century (Hutchins 1986). The first machine translation (MT) applications are known from the fifties. Much effort was made and a lot of (some would say wasted) money was spent to advance this technology. Despite the long history and all the energy and money invested, machine translation is still far from being a technology in widespread use.

In Germany, for example, there are hardly more than 30 installations of machine translation systems which are actually integrated into the daily work of a translation service (Bernhard 1991). Having been a user of machine translation since 1986, I know very well that the number of machine translation users does not increase; it rather stagnates. Of course, there are some new users, but there are also earlier users abandoning the application of this technology.

In the following, I would like to discuss the reasons for the reluctant application of machine translation and I will try to find out what has to be changed to make machine translation an accepted and widely used tool in the translation business. Let me first consider the current state of application of MT, that is the MT systems available on the market, the current scenarios of application of MT and the users of MT systems today.

## 2 Current state of application of MT

First, I would like to define what I understand by machine translation and by application of MT. By machine translation I understand the translation of written text by a computer system working automatically to some degree. There may be some amount of human intervention, that is pre-editing source texts to make them machine readable, adding unknown words to the dictionary or post-editing target texts to make them human readable, but the actual translation process, that is usually analysis, transfer and synthesis, should be automatic and should run in batch mode unless there is some interactive component asking the user to solve problems the machine cannot solve. Therefore, in my understanding, machine translation is not speech translation and it is not machine-aided translation in the sense of support by computerised dictionaries, terminological databases, translation memories etc.

By application of machine translation, I understand the use of this technology as a tool for producing translations. I do not understand it to be any experimental use for development purposes. Therefore, the users in my understanding are mostly translators, i.e. the people working directly with an MT system, or end-users, namely the people working with the products of machine translation systems. The end-users are a most interesting and most heterogeneous group ranging from knowledge workers such as technical writers and researchers to top-level decision makers such as top managers and political leaders.

Let us have a look at today's conditions of application of MT, namely the machine translation systems available on the market.

## **2.1 Available MT systems**

Despite the long history of machine translation, already mentioned, the number of machine translation systems available on the market is still somewhat restricted. Of course, there is a great number of PC-based translation systems, but the majority of these systems translate word-by-word without being based on some linguistic theory or grammar. Their scope of use is rather restricted though they are doing well for little money if their restrictions are considered. Nevertheless, I am wondering if they actually are machine translation systems in the sense defined earlier.

In my present contribution I want to concentrate on some more sophisticated machine translation systems and their number is small indeed. These are the "big three": SYSTRAN, LOGOS and METAL, though we should not forget TOVNA and LMT. We see there is not much choice. The systems are of a rather similar approach; their use usually requires pre-editing of source texts, adding unknown words to the dictionary, and post-editing of target texts. The raw machine translations of all the three systems are only of restricted use, for example for browsing purposes, but end-users should be experts in the specific field to recognise any possibly failed translation.

The cost for systems like the "big three" is very high and until recently it has been very difficult to integrate them into an existing environment. Even today there are still problems with interfaces to the available word processors and desk top publishing systems. The scenarios of MT system applications are therefore of great importance.

## **2.2 Scenarios of MT system application**

Today, MT systems (except PC-based systems) are mostly used by big organisations. MT systems are rather expensive and still require specific hardware (workstations). Individuals, for example freelancers, medium-sized commercial translation bureaux or small companies cannot afford such systems. The systems are mostly used by big translation services producing technical texts, such as manuals and other technical documentation. Mostly, the source texts are pre-edited, the system dictionary is extended by unknown words and the raw machine translation is fully post-edited. There are some rare applications where only some light or rapid post-editing is made and where the machine translation is used as a basis for producing a final version.

There are an increasing number of people using something like the so-called translator's workbench, that is an integrated system consisting of various components including word processor, computerised dictionary, translation memory and a machine translation system. The suitable tool set is selected in accordance with the work to be done and the performance needed.

In some scenarios using rather robust translation systems, there is fully automatic translation though not of high quality as yet. That is, neither pre-editing, nor dictionary extension, nor post-editing is done. The machine translations are used for browsing or drafting purposes.

Who are the people involved in the application scenarios mentioned above?

### **2.3 Users of MT systems**

Today, users are mostly translators using the systems as a tool in their daily work, namely the production of translations from one natural language into another. They are the people who do the pre-editing of source texts, the extension of the dictionary by unknown words and the post-editing of target texts. They do this work either as all-rounders in a multi-functional job, that is one person does pre-editing, dictionary extension and post-editing, or in a division of labour, that is one person does only pre-editing, another only dictionary extension and a third person is specialised in post-editing.

In some cases, users are also technical writers or translators who are not involved in the immediate use of machine translation. They use machine translations which have undergone so-called light or rapid post-editing as a basis for producing the final version.

The other type of user I mentioned before is the end-user. These are the people actually working with the translated texts. Mostly, they do not know whether it is a machine translation or a human translation. They do not bother about the method of translation if the outcome is of use to them. In some still rare cases, the users know that they get a machine translation and they even want to get such a translation since they want to have it quickly. These are the cases where machine translation is used for browsing purposes, the users want to get a translation as quickly as possible and they are willing to accept lower quality, somewhat like "quick and dirty". In these applications, there is usually neither pre-editing, nor dictionary extension, nor post-editing. If post-editing is done, it is not done by translators but by other people speaking the target language as a native language.

## **3 Reasons for the reluctant MT application**

What are the reasons for the reluctant application of MT systems? There are three classes of reasons, namely MT-system-specific reasons, scenario-specific reasons and user-specific reasons. The following presents these three classes.

### **3.1 MT-system-specific reasons**

As already mentioned, MT systems, except PC-based systems, are rather expensive. In many cases, specific items of hardware, namely workstations, are required for the systems. Their integration into an existing environment is mostly complicated and time-consuming since, by tradition, MT systems are isolated solutions. The operation of MT systems is not easy and still requires well trained, highly specialised personpower. The translation quality is somewhat poor if compared with the high cost of such systems. Quality improvements need a very long time and sometimes the correction of one error produces another error somewhere else.

By the way, within the past eight years, that is the period of my MT system application, there has not been any substantial improvement in the linguistic performance of the MT systems I know from my own experience, that is LOGOS and METAL. The only improvements were improvements of the user interface which were very necessary indeed since the early MT systems were not user-friendly at all. Altogether, it is still very difficult to get a favourable cost-benefit analysis of a machine translation system application.

### 3.2 Scenario-specific reasons

Today's machine translation systems are only suitable for translating technical texts of homogeneous terminology and a relatively poor style. Many enterprises introducing a machine translation system are not aware of this fact and think that such an expensive system should be universal.

Moreover the time required for integrating the system into the existing environment and for tailoring it to the company-specific needs is mostly underestimated. The increase of productivity promised by MT system manufacturers is difficult to achieve. In practice, this will take rather a long time.

Another problem is the person-power involved in operating an MT system. Decision-makers are often not aware of the fact that the operation of today's machine translation systems needs highly specialised people. Many decision-makers continue thinking that MT systems can replace translators and therefore they make no effort to involve the translation service as early as possible in the decision making process for introducing a machine translation system. In addition, managers often neglect the problems of work organisation. Division of labour, for example, is most efficient from the viewpoint of increased productivity, but it may lead to human problems, namely monotonous work and low satisfaction. On the other hand, multi-functional jobs may lead to problems in quality assurance and control, for example how to secure terminological consistence if several people do terminology work. This brings us to the user-specific reasons.

### 3.3 User-specific reasons

As already stated, users of today's machine translation systems are mostly translators working in the translation services of big organisations. The traditional education of translators is not very technology-oriented though there has been a change in recent years. Many translators regard machine translation systems as job killers. Their attitude towards these systems is somewhat contradictory. They are not willing to do post-editing of low quality machine translation; they would only accept a perfect machine translation system delivering human translation quality though such a system would actually be a job killer.

There is still another problem. In most cases, the translators who should use an MT system are not involved in the decision-making process leading to the introduction of the machine translation system; the actual decision makers are rather managers having heard something about the information society and DP experts looking forward to getting a new nice toy. Therefore, the enthusiasm about the new tool is rather restricted among those users. Nobody asks them if they want to get it; they have simply to work with it and often they have to do so without sufficient training.

End-users are often too optimistic; they expect from the introduction of an MT system much better and quicker service and they underestimate the time required for achieving this goal. If using raw machine translations for browsing or drafting purposes, they are sometimes disappointed with the bad quality of these translations, but primarily they highly appreciate getting their translations faster.

## 4 Measures for improving MT system application

In the following, I shall try to discuss some measures for improving the application of MT systems. As before, I am going to use three classes, that is system-specific measures, scenario-specific measures and, last but not least, user-specific measures. I think that these measures might help to make the application of machine translation systems more popular.

#### **4.1 System-specific measures**

The user-friendliness of machine translation systems should be improved further. User-friendliness in this sense means a better integrability of systems into existing environments. There should be interfaces to existing word processors, desk top publishing systems and other software. Another important factor is ease of use; the user interfaces should reflect the state of the art in computing. Dictionary extension should be facilitated by at least semi-automatic dictionary coding. The improvement of machine translation quality is of primary importance. The linguistic performance of MT systems is still too poor and, as a long-time user of such systems, I know that there are some most irritating errors in machine translations which should be urgently attended to.

Manufacturers should provide integrated translation environments like the translator's workbench already mentioned earlier. Such environments would enable people to use the different components as required by a specific job. For example, in some cases it would be more economical to do without a machine translation system and to use only a computerised dictionary, e.g. for parts lists.

Machine translation systems should be more robust; they should need less pre-editing, dictionary extension and post-editing. Unknown words or too many words per sentence should not stop sentence analysis. Altogether, human intervention should be reduced by increased automation.

#### **4.2 Scenario-specific measures**

Decision makers should be more realistic. They should consider the restricted applicability of MT systems and they should not expect a quick increase of productivity.

The source text problem should be solved. The quality of a machine translation depends critically on the quality of the source text. Therefore, technical writers should observe specific stylistic guidelines avoiding ambiguities. The use of restricted or controlled languages is to be discussed in this context.

New innovative application scenarios should be developed. Machine translation for browsing or drafting purposes is certainly a promising scenario. Furthermore, remote access to machine translation systems via networks or the integration of such systems into world-wide information networks for translating, for example, database descriptions, abstracts, e-mail messages or other information, should also be considered a scenario of the future.

Above all, the human factor should not be neglected in any application scenario. People decide whether an MT application is successful or not.

#### **4.3 User-specific measures**

Users, especially translators, should be more realistic with respect to the performance of MT systems. They should not expect too much. They should accept MT systems as a tool helping them to do their work by relieving them from boring routine, by facilitating terminological updating and by securing a consistent use of company-specific terminology. To achieve such a realistic attitude, the application of MT should be a component of the education of translators.

On the other hand, MT system developers and manufacturers should not forget the user. Developers should involve the users as early as possible in the development of MT systems and they should regard the users' bug reports as valuable help and not as an attempt to kill the MT system by testing it. The manufacturer's sales people should ask for an early participation of translators and end-users in the decision-making process for a possible MT system introduction.

By the way, users should also try to involve themselves, they should not wait to be invited to do so.

Decision makers at research policy level should provide funds for human-centred application research, studying both future impacts and potential chances of MT.

## **Conclusion**

To conclude, let me answer the question at the beginning - Where are the users? There are many users in all places where translations are produced or used, but most of them are potential users since they are waiting for more user-friendly, integrable machine translation systems providing a better translation quality and allowing a really efficient use of this technology. I think that developers, manufacturers and sales people have still much to do to make machine translation a technology of widespread use.

## **References**

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