The Current Status and Future of Machine Translation Research in Japan

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1. Background

We have seen remarkable progress in machine translation technology in recent years, and in Japan several corporations have begun marketing practical machine translation systems. The progress in machine translation systems is largely due to the progress in computer technology. For one thing, the improvement the hardware capacity for processing data has enabled the computer to handle an extremely large amount of information. Even a desk-top computer these days can handle the amount of information which only a large general purpose computer could handle ten years ago. This made natural language processing quite a bit easier. On the other hand, large computers are faster and can handle much more information, and this enables very sophisticated translation. Secondly, the accumulation of

research in the field of artificial intelligence is playing a large role in the progress of machine translation. Through the progress in research on knowledge processing, the technology for computer processing of natural language is developing.

Natural language processing technology is an area where, among all fields of science and technology, the most remarkable technological progress is being made. As a matter of fact, we will be seeing so much progress in this field that we can expect to see drastic progress in machine translation technology in the future.

2. Current Status of Machine Translation in Japan

The current status of machine translation systems in Japan is at the threshold where the practical machine is beginning to emerge.

The major computer makers began to put more energy into research and development of machine translation technology in the late 1970s and the early 1980s. Currently, more than 10 companies have put English to Japanese and Japanese to English translation systems on the market. Most of these systems are for translating

technical documents and manuals. Since most of these systems have been put on the market only recently, there are no reliable evaluations of them, and the market itself has not yet matured. However, the potential demand for the translation systems is great, if and when inexpensive systems become available. We are hoping that the development efforts by private corporations will lead to better quality machines.

On the other hand, there are development efforts by public organizations such as Kyoto University, Tokyo Institute of Technology and Electronic Technology Laboratory concerning machine translation research. These organizations are engaged in basic research, and are focusing on computer processing of natural languages.

In addition to research in the private sector, universities, and national organizations, are engaged in cooperative research and development projects on a national level.

One project involves the development of a machine translation system in cooperation with neighboring Asian countries. The project, which has been entrusted to CICC by MITI, has just started this year and involves machine

translation between Japanese and such languages as Chinese, Thai, Malay and Indonesian. By cooperating with the countries involved, the system development is to be promoted at a cost of six billion yen for six years. Although Japan and its Asian neighbors are geographically close, the language barriar imposes restrictions on the exchange of information. We can expect the development of this system to promote the smooth exchange of information and the diffusion of Japanese industrial information and technical materials into other Asian countries. Furthermore, joint research and development involving engineers of Japan and these countries will also promote the shift of the information processing technology which is the base of industrial technology. Since this project has just started, many problems may arise before research and development get under way. Nevertheless, considering the importance of this project, we will try to do our best to obtain fruitful results.

Another important project already underway concerns the development of an electronic dictionary. The project is being promoted by the Japan Electronic Dictionary Research Insitute, Ltd., which was founded with joint

capital from the Key Technology Center, a government-related institute, and such corporations as Fujitsu, NEC, and Hitachi. The goal of the institute is research and development of a large scale electronic dictionary, which will be the basis for natural language logic processing by the computer. Needless to say, the impact and impetus of the development of high-quality and large-scale electronic dictionaries will be very great indeed. However, at this point, the development of such dictionaries will involve substantial amounts of time and money. It is necessary to engage in a large amount of development. For this reason, everyone involved is determined to combine their resources to the end of developing electronic dictionaries, and MITI is going to provide active support.

In Japan, other major projects include: a Japanese/English and English/Japanese machine translation system to promote scientific and technical reference information; and a telephone machine translation system to facilitate international communication.

3. Prospect for the Future

Regarding the future of the machine translation system, all we can really say is that the future is still hard to predict. There was a time when we were full of hopes for a practical machine translation system, which was followed by a time when we were totally devoid of hope for such a system. On the one hand, the progress of computer technology is so fast that what was impossible a few years ago has suddenly become a reality. This makes technical predictions very difficult. On the other hand, what we expect of a machine translation system and what is practical and what is not are still ambiguous. This has caused the appraisal standards of a machine translation system to vary from person to person. In order to develop a machine translation system in the future, we must coordinate the needs of the users and perform appropriate appraisals.

It is probably true that a machine translation system will surpass the capability of human translaters in terms of accuracy and wealth of expressions. However, by limiting the use of the system and having an appropriate support system, it will be possible to use

the system for certain practical uses. More to the point, we must find out what is possible for a machine translation system and what is not. In reality, the systems currently in use are used in such a manner.

Machine translation systems have just been created, and we must be careful in evaluating them. It is up to the developers to further develop them. However, users will be able to contribute to development by providing the most appropriate environment for the system. From this point of view, it is very meaningful that we be able to exchange opinions about the development conditions and the conditions of concrete use of machine translation systems. MITI intends to provide positive support for such opportunities.

We are sure to see more progress in machine translation systems and the new products on the market. The role of the Japanese government will be limited to development of a system in which language information is readily available. In Japan, for example, private corporations will take initiative on J/E and E/J translation systems in order to improve the system capability and market development. On the other hand,

cooperative development projects for the systems involving neighboring countries will go beyond the capabilities of the individual corporations. Therefore, these projects will naturally fall on the shoulders of the national government. Also, the national government will play a major role in developing a common base in such areas as electronic dictionaries.

Machine translation systems will form an important infrastructure in our future society in that it will remove the language barrier between countries, and activate the international exchange of information. I am looking at the development of the system with a great deal of hope.