# Report on Machine Translation Market in Japan

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## Abstract

This paper reports the current situation of the machine translation (MT) market in Japan, based on a survey conducted through questionnaires and interviews. The research targets three groups: MT manufacturers (including sales agents), professional translators and translation agencies, and general users. We completed the questionnaire on the first group and are now querying the second group through interviews and questionnaires. According to the survey of manufacturers and vendors, shipments and sales of MT systems plunged during 1996 to 1998. but respondents are expecting a slight recovery in 1999 and 2000. The primary requirement to raise shipments and sales is improvement of translation quality, most respondents believe. The survey of translation professionals started with the first interview on June 25. We plan to interview at least 20 people in the translation industry in four meetings. The results will be orally reported at the conference site. We are also designing the questionnaire for general users, which we plan to finish by the end of this year.

## 1   Introduction

We are living in the era of global networks in which information we need is very often written in language other than our native tongue. This situation has made machine translation indispensable to browsing the Internet.

However, no one knows what is going on in the Japanese MT community, either on the manufacturer side or the user side. To clarify the real situation and to predict the future market, the Asia-Pacific Association for Machine Translation (AAMT) has begun survey research through questionnaires and interviews. The survey is mainly responsible for the Market Research Committee,  and the later joint meeting of the Market Research Committee and Technical Research Committee.

The research is divided into three parts: (1) questionnaires to manufacturers. (2) interviews with professional translators, and (3) questionnaires to general users. Question sheets vary among three groups. This paper shows the results of part 1 and the progress of part 2. which will be completed by September. We are also designing the questionnaire for part 3 with the cooperation of Mitsubishi Research Institute. The following sections describe the details of parts 1 and 2.

## 2   Survey of MT Manufacturers

We investigated shipments and sales of MT systems, source and target languages that MT systems process, and platforms of MT systems by collecting questionnaires from manufacturers. To keep the raw data confidential, we asked an audit company to collect and count the data. The results were discussed in the joint meeting of the Market Research Committee and Technical Research Committee.

### 2.1 Methodology

We sent the questionnaires to MT manufacturers and vendors December 1, 1998 and had collected them until the end of February 1999.

**Scope**

Target systems in our investigation are limited to MT systems sold in Japan. Programs pre-installed in computers and OEM supplies are also included.

**Language Combinations**

Translation in Japan is usually between English and Japanese. We set the four patterns of language combinations in the questionnaire, as follows:

- English to Japanese
- Japanese to English
- Bi-direction (E to J and J to E)

### Table 1  Shipments in Each Year

| Language Combinations | | Numbers of Shipment | | | | |
|---|---|---|---|---|---|---|
| | | 1996 | 1997 | 1998 (Provisional) | 1999 (Forecast) | 2000 (Forecast) |
| Package | E to J | 55.084 | 33.985 | 16.504 | 20.520 | 22.570 |
| | J to E | 18.718 | 12.918 | 5.483 | 5.980 | 6.740 |
| | Two-way | 34.677 | 38.300 | 39.116 | 166.660 | 68.190 |
| | Others | 750 | 3.145 | 4.300 | 6.000 | 6.000 |
| Pre-installed | E to J | 608.686 | 1,127.187 | 940.000 | 1,000.000 | 1.070.000 |
| | J to E | 0 | 0 | 0 | 0 | 0 |
| | Two-way | 2.000.000 | 1.800.000 | 1.800.000 | 2.000.000 | 2.500.000 |
| | Others | 0 | 0 | 0 | 0 | 0 |

### Table 2  Sales in Each Year

| Language Combinations | Sales (1.000yen) | | | | |
|---|---|---|---|---|---|
| | 1996 | 1997 | 1998 (Provisional) | 1999 (Forecast) | 2000 (Forecast) |
| E to J | 867.307 | 615.368 | 302.127 | 360.523 | 386.823 |
| J to E | 539.702 | 348.223 | 165.783 | 184.479 | 165.359 |
| Two-way | 439.606 | 467.836 | 670.878 | 1.883.380 | 914.200 |
| Other | 46.180 | 81.390 | 125.940 | 152.790 | 164.440 |

- Other languages

The last category includes translation from Japanese to Chinese, from Korean to Japanese, etc.

**Software Packages / Pre-installed Programs**

We analyzed shipments and sales of MT software packages and pre-installed MT programs separately. The software packages are sold independent from hardware while the pre-installed programs are parts of computer systems.

**Shipments and Sales**

Manufacturers answered about actual shipments and sales in 1996 and 1997. provisional shipments and sales in 1998, and forecasts for 1999 and 2000 years in this paper are all Japanese fiscal years: April 1 to March 31).

## 2.2 Results

**Return Rate**

The return rate was 48%. We sent the question sheets to 44 companies and collected from 21 companies. However, we counted 19 companies because two did not answer about actual sales.

**Requirements to Improve Sales**

We also asked manufacturers to list factors that they think are necessary to improve sales of MT sys-

tems. Numbers in parentheses indicate the number of answers.

a.  Translation quality (15)

b.  Reasonable price (9)

c.  Public relations (7)

d.  Linkage with other application programs (7)

e.  Dictionary size (6)

f.  Easy-to-use interface (4)

g.  Variety of functions (3)

h.  Catchy name (1)

i.  Pretty appearance of package (0)

  (Although we assumed that some companies would consider this item as an important factor, no company did not list it)

## 2.3 Analysis on Shipments

The release of Windows 95 toward the end of 1995 triggered the Internet boom in Japan. Since only a few Japanese home pages were open at that time, WWW surfers often tried to look at overseas home pages written in English. People who were not good at reading English but wanted to know the contents of English home pages were anticipating the advent of a system specified for translating Internet home pages.

NOVA hit this target. Its products, PC-Transer and NetSurfer (special version to WWW browsing), were leading the MT market in 1996. NOVA's success triggered PC manufacturers' release of their own translation software.  Toshiba put on the market its
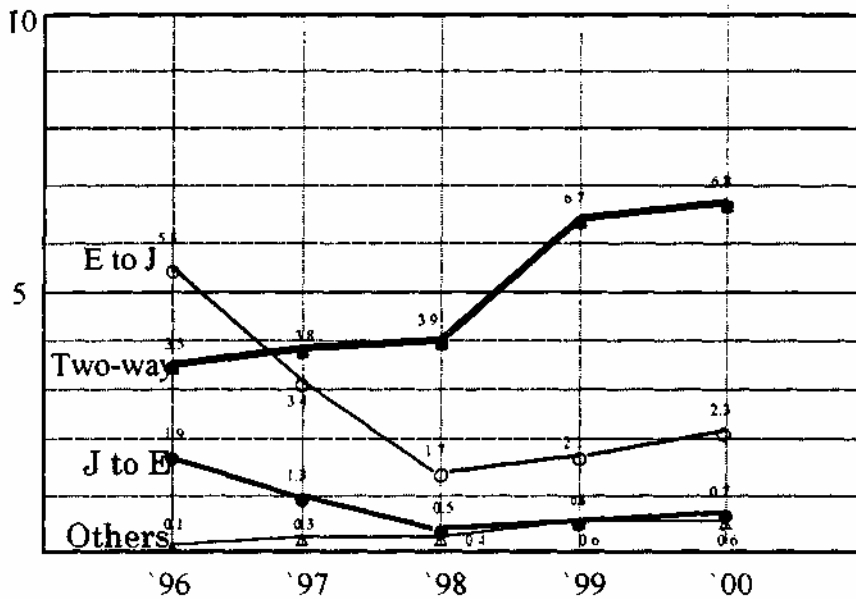
(10 thousand systems)



Fig. 1   Shipments of MT Packages

ASTRANSAC for Windows (presently The HONYAKU Professional, which means "translation professional"), and Fujitsu began to sell ATLAS for Windows. The first column of Table 1 shows the large volume of shipments in 1996.

number while two-way systems were increasing the shipments, as shown in Figure 1. This is probably because manufacturers combined E-to-J and J-to-E systems which they had been selling separately before 1996. This tendency can be seen also in the transition
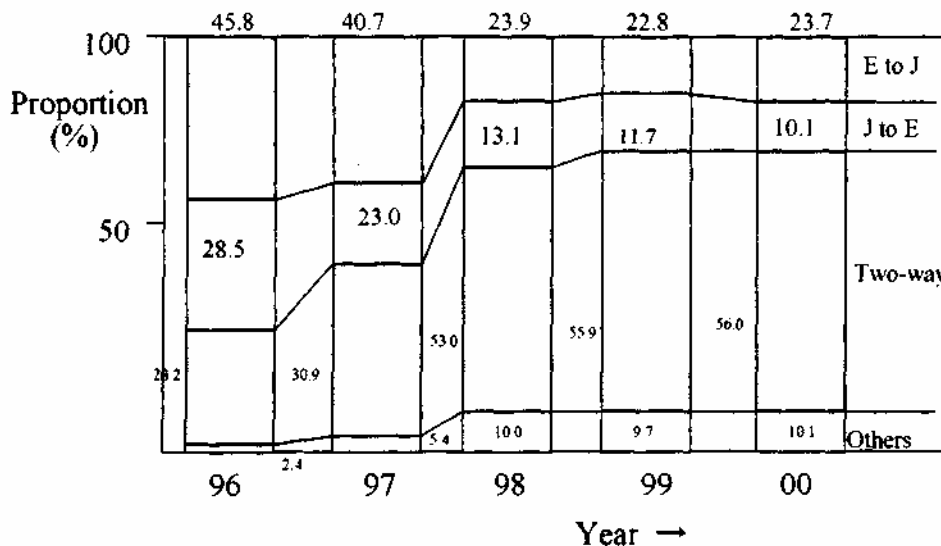


Fig. 2   Proportion of Language Combinations (Shipment)

In 1997 and 1998. shipments of one-way translation systems (E-to-J or J-to-E) were decreasing in

of language combinations shown in Figure 2. Selling
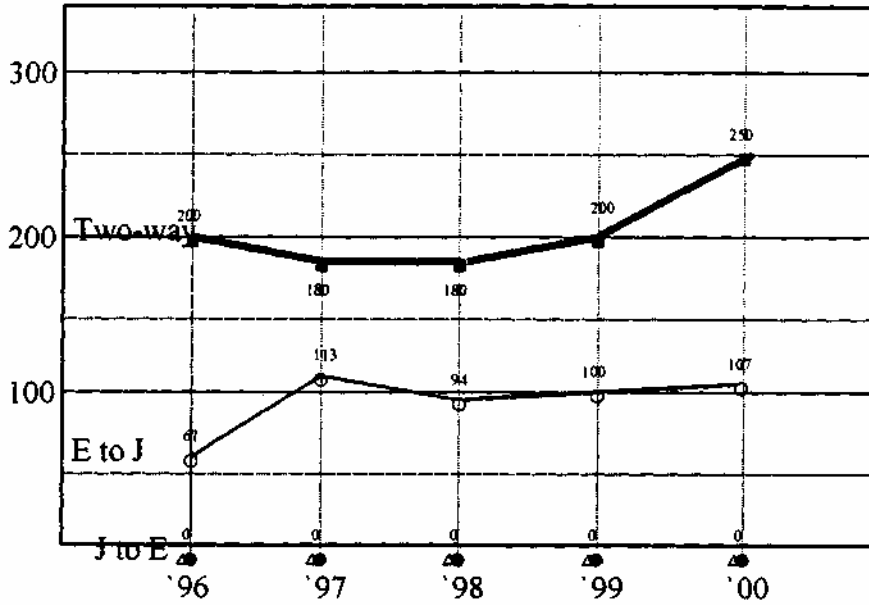
**(10 thousand systems)**



Fig.3   Shipments of Pre-installed MT

combined packages of E-to-J and J-to-E systems is now taken as a matter of course by manufacturers.

pre-installed Microsoft Word or Microsoft Excel. A pre-installed MT program is now indispensable to
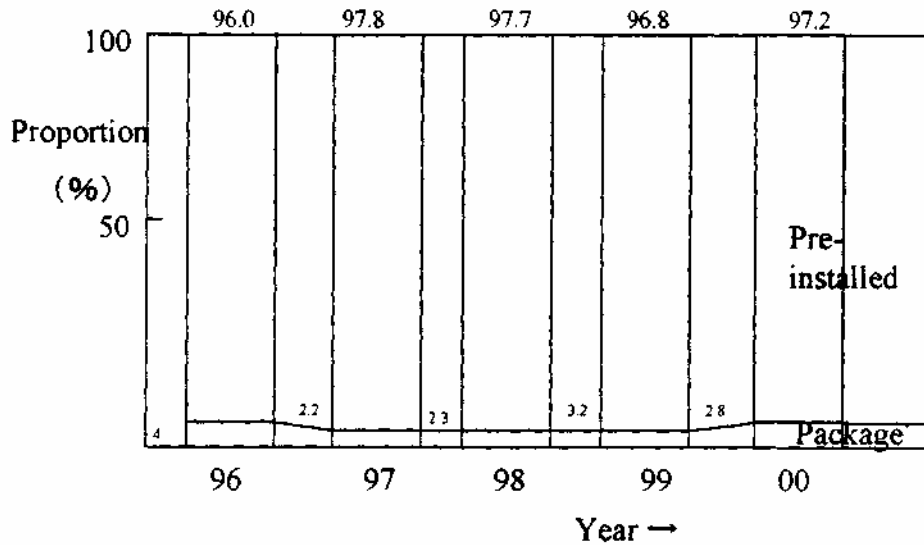


Fig.4   Proportion of sales types

Pre-installed MT systems have a different trend as shown in Figure 3. The pioneer of a pre-installed MT system was IBM Japan, which pre-installed HONYAKU NO OHSAMA (meaning "king of translation") on its personal computer, Aptiva. Other Japanese manufacturers followed IBM by pre-insstalling their MT programs on their computers, as they have

their PC catalogues. As a result of the popularity of pre-installed MT systems, MT software packages remain only 2.2 to 3.2 percent of the entire shipments of MT systems, as shown in Figure 4. Thus, a pre-installed MT program can spur sales of personal computers, and increasing sales of personal comput-

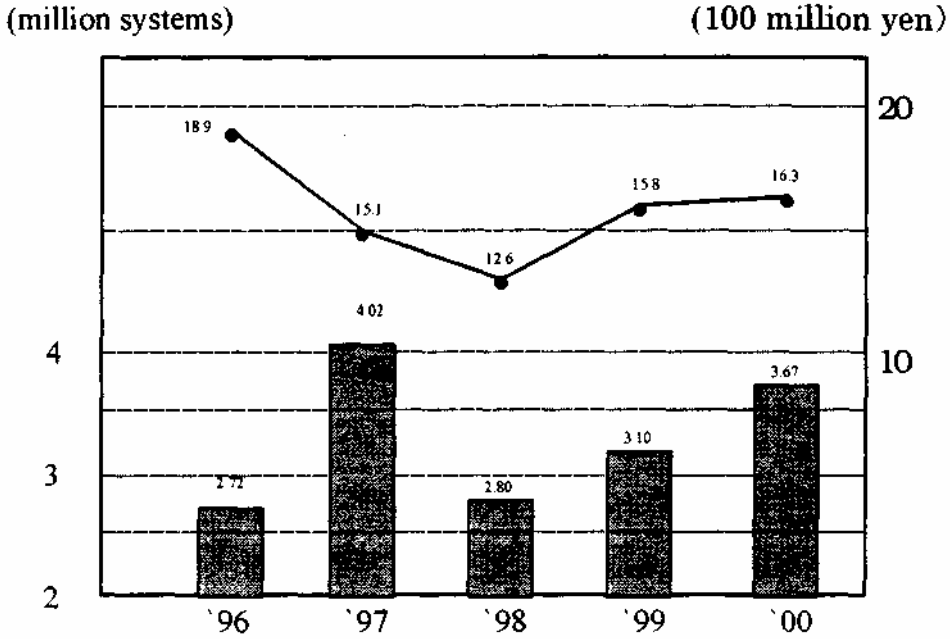(million systems)                              (100 million yen）



Fig. 5 Total Shipments and Sales of MT Systems

ers with MT software means increasing sales of MT programs.

shown in Figure 7, while total shipments of MT systems (both pre-installed and package) were about
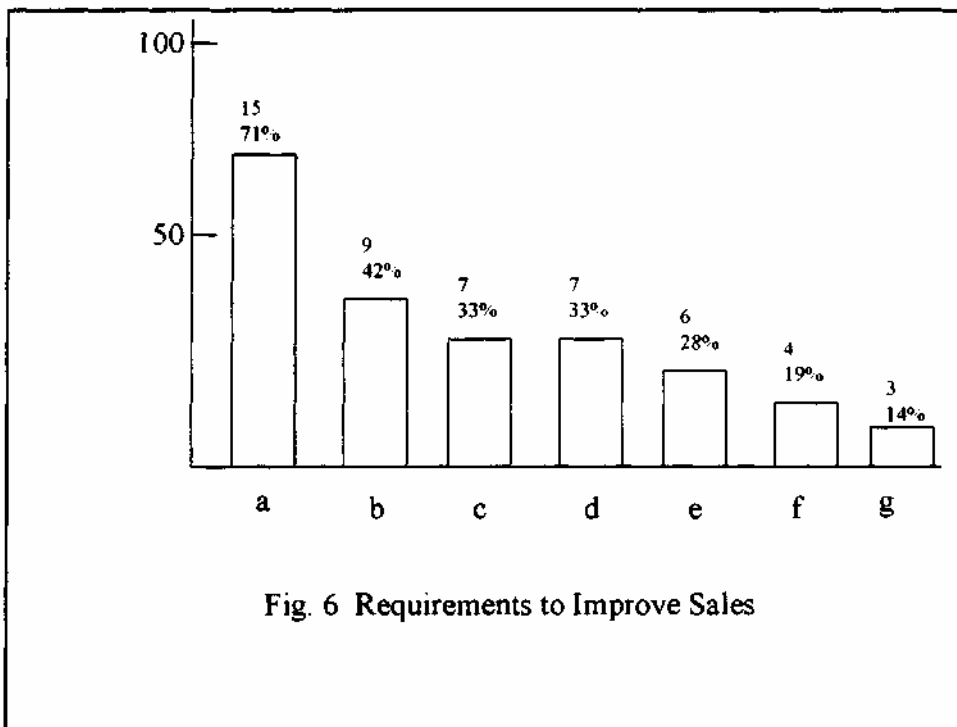


Fig. 6 Requirements to Improve Sales

The shipments of personal computers in Japan in 1996 totaled about 7,190,000 (according to Japan Electronic Industry Development Association), as

2.170.000 in number. This means that one of 2.6 PC users has a translation system. We can declare that

machine translation systems literally have spread throughout Japan.

## 2. 4 Analysis on Sales Amount

Figure 5 shows the decline of sales of machine translation systems in 1997 and 1998. The sales plunged 20.1% in 1997 and 16.4% in 1998. This is probably because sales of personal computers as platforms of machine translation had decreased (5.5% down) and because machine translation systems, lacking freshness, were not appealing to consumers any more.

Another difficult question with respect to sales is "price." Although price places second as a factor in raising sales (Figure 6), it can be double-edged. The price of an MT system was drastically reduced as a result of the "discount race" among MT manufacturers and vendors.  As Figure 7 shows, the average price of MT software programs pre-installed on computers is now only 500 yen (approximately four US dollars) while it was 700,000 yen (approximately 6,000 USD)

languages are soaring 76.2% in 1997 and 54.7% in 1998. This increase may suggest that translation quality between Korean and Japanese, which linguistically resemble each other, satisfies the market's requirements.

## 2.5 Subjects in Future

Our respondents already know what is necessary for their MT programs to appeal to their users. As shown in Figure 6, the most important factor is translation quality. The depression of sales in 1997 and 1998 probably reveals that users have not been satisfied with output from machine translation systems.

Linkage with other programs is also an important factor. Now that functions and user interfaces of MT software have matured, machine translation needs another market to be a lucrative business. Linkage possibilities might include simultaneous interpretation with speech recognition, plug-in MT to Internet browsers, summarization function,  and bilingual Web
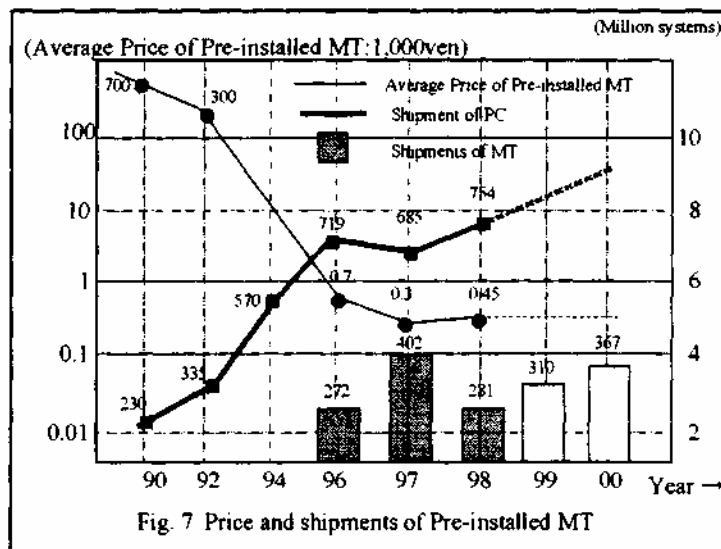


Fig. 7  Price and shipments of Pre-installed MT

in 1990. Software packages of MT are already around 10,000 yen (about 80 USD).. Further decreases in prices will severely damage the industry.

The year 1998 saw the revival of the PC market based on notebook computers and replacement of old personal computers. Popular notebooks include Sony's Vaio. Toshiba's DynaBook. IBM's Think-pad, and Sharp's Mebius. Increased sales of personal computers led to a slight increase in MT software sales, as shown in Figure 5.

MT systems for other languages is another story. As shown in Table 2,  sales of MT systems for other

search. In spite of the market demands, these types of attractive systems have not been developed,  and manufacturers have failed to increase users' demand.

In addition to the above results, we need to research the opinions of professional translators and general consumers to regenerate the machine translation industry in Japan. The next section reports research progress on our survey of professional translators.

# 3 Research on Translation Professionals

This research targets professional translators as significant users of machine translation systems. Through interviews and questionnaires with several translators, we are investigating the current situation concerning translation jobs, reaction to translation systems, documentation systems, electronic dictionaries, needs of professionals, division and automatization of translation process, etc.

## 3.1 Target

The target users of this investigation are as follows:

a. In-house translators in translation agencies

b. In-house translators in manufacturers

c. In-house translators in law firms, counting houses, patent attorney's offices, etc.

d. Free-lance translators

e. Other professionals

## 3.2 Methodology

We sent questionnaires to the interviewees beforehand, and several members of the joint committee took part in the interviews. The committee analyzed the results with the cooperation of Mitsubishi Research Institute.

## 3.3 Results of the First Interview

Five professional translators and four members of the committee joined the first interview held on June, 25. The responses to questionnaires revealed their profiles and job situations as follows.

The youngest translators are in their twenties while the eldest are over fifty. Their experience ranges from five to twenty years. Four translators put English into Japanese in their job. and one put Japanese into English. Three of them are translating computer-related documents, and other subject areas include social, natural, and medical sciences. They translate mainly operation manuals, though document types are various. Their primary job is translation, but they sometimes check or rewrite translated documents. Their translation speed is about 15 pages or 3000 words per day, and the fee is approximately 2000 yen (17 USD) per page. They receive the source text and deliver the translated text either in printed or online format. All of them are using personal computers, but only two are using machine translation or machine-aided translation systems. They mainly use printed dictionaries, and only a few are users of electronic dictionaries. To the question whether they considered MT systems in the past, two answered "yes," but they gave it up because of poor quality output.

Besides the results of the questionnaire, we learned much from the interview. Clearly, the general feeling about machine translation is "negative." Although the translation industry is short of competent professionals, agents or translators do not tend to rely on machine translation. The primary reason that they neglect MT is poor quality of its output. They mentioned that using MT usually costs more than human translation because of pre- and/or post-editing that requires the expertise of professional translators. Even a respondent who is using an MT system considers it as a kind of electronic dictionary.

"Dictionary" was a key word in the interview. Clients who order translations usually do NOT offer their glossary to the translators, except in the case of software localization. Therefore, translators heavily depend on dictionaries, and most parts of their annual expense, which ranges 500.000 to 1.000.000 yen (4000 to 8000 USD), are devoted to dictionaries.

Contrary to MT systems, translation memory such as Trados is broadly used as a strong tool among translators. In addition, they respond that they will use translation software if the system allows them to customize syntactic patterns. When an interviewer asked about corpus, some translators answered that corpus containing well-written texts of their target documents would be helpful.

Translators' responses above may suggest the following future directions that our industry should take

• Improvement of translation quality

• Development of reliable dictionaries

• Development of example- or corpus-based customizable MT

The results of the second or later interviews will be orally reported at the conference.

# 4 Activities in 1999

We plan the following activities in this fiscal year:

a. To redesign the questionnaire to MT manufacturers/vendors, reflecting the results of this year.

b. To continue the survey of professional translators through questionnaires and interviews, together with a research institute.

c. To investigate trends of general users (prospective users) through questionnaires.

d. To issue a White Paper on Machine Translation in Japan (tentative), collaborating with the working group for the white paper and other committees in AAMT.

e. To report the current situation of Japanese MT industry in the Singapore summit.

# 5 Acknowledgements

In writing this report, we relied on the board of directors, officials, and other committees in AAMT. Ministry of International Trade and Industry, the Ja-

pan Electronic Industry Association, and other related organizations.

This report is  based on the collaborative activity of Technical Research Committee and Market Research Committee.  We thank all the members of the committees who joined the investigation and especially appreciate the effort by Mr. Hatanaka in Technical Research Committee, who analyzed the results of questionnaires from manufacturers/vendors.

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## References

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Market Research Committee of AAMT started in 1995. The purpose of the committee is to grasp the variable situation of the MT market, to disseminate the concept of machine translation, and to expand its use in businesses. Its members include representatives from MT manufacturers, users, and academic organizations