Evaluating Machine Translation in the 1990s

Report by Bertie Kaal*

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This was the fourth meeting of the International Association of Machine Translation (IAMT) and it appears that the big issues for the next few years in MT are further evaluation of existing systems and putting the results of evaluation surveys into practice. There is a great need for standardisation of language specific ans specialised text corpora in the regions for effective information exchange. As a side-kick, advances are being made in MT systems for PC use which may open up a large market in the next two years. Funding for Research & Development in MT seems to be readily available.

The IAMT is an umbrella organisation for the European Association of Machine Translation (EAMT), the Association for Machine Translation in the Americas (AMTA) and the Asia-Pacific Association of Machine Translation (AAMT). Over 200 people attended the conference of which about 80% came from Japan. Attendants were academics in computer science and linguistics and R&D people from industry and government institutions as well as financers of MT projects.

Since Weaver's 1949 memorandum on Machine Translation, vast amounts of money have been invested in the development of MT systems by both governments and industry, because there is a great need for the translation of enormous text corpora in an efficient and standardised way. Especially Japan, the USA, Canada, the former Soviet Union and the European Commission have been active in developing MT systems. In recent years, the biggest increases have been in the USA.

In his opening speech, *Professor Makoto Nagao* (President of the IAMT and AAMT) said that now the time has come for global collaboration and therefore standardisation of the data. SGML and the Text Coding Initiative could form the basis for global standardisation.

International collaboration is not a new thing, in particular Eurotra (European Commission) and GETA have been very active. Further international collaboration is being developed in the Far East at the Centre of International Cooperation for Computerization (CICC), a consortium including Japan, China, Thailand, Singapore, Malaysia and Indonesia. In this context, Mr. *Toshinori Saeki* (MITI, Japan) mentioned that the relatively low level of telecommunication networking in Japan should be improved if international cooperation is to be encouraged.

The need for a workable system is urgent and has lead to a healthy balance of sponsoring MT

Professor Makoto Nagao

research by both governments and industry. It seems as if the financial flow will not stop until a workable system emerges, especially in Japan, though sponsoring elsewhere is constantly under review. Japanese
MT development is sponsored by the Government (70%) and Industry (30%). In Germany, the Verbmobil project currently has a budget of DM 60 million from the Government and DM 30 million from Industry for Phase 1 of the project (4 years). The EC Language & Technology Programme (ECLAT) has proposed a budget of 400 million ECU (nearly $ 500 million) for 1994-1998. But this is not purely for MT research.

Machine Translation — Human Translation
Rest assured that these budgets are not invested in order to rain the lives of people who earn their living from translation. It is simply because world trade,

John Hutchins

Margaret King

Muriel Vasconcellos

international politics and fast communication technology result in enormous amounts of paperwork that *must* be translated for commercial and political reasons but also in order to preserve the world's colourful spectrum of languages.

For instance, *Dr. Ahmed Zaki Abu Bakar,* Director of the Malaysian Computer Translation Unit (CTU), explained to me that, though expensive, the Malaysian Government has a strong policy towards language maintenance, involving the translation of a wide selection of educational material and literature at all levels. The CTU is developing an MT system for this purpose with a starting budget of $ 10 million because they simply would not have enough translators to keep up with the demand.

History

John Hutchins, editor of the *MT Newsletter,* gave a masterly survey of the past and current state of play in machine translation. He claimed that a new era of MT research was emerging leading to a "third generation" of MT system design, combining the essentials of the rule-based approach of the "second generation" with the corpus-based methods which are now coming to the fore. "The MT Community", he concluded, "does not have much time to establish the standards which potential users need to evaluate the relative merits of the systems. If it does not do so, there is a risk that the whole MT endeavour will gain a reputation for exaggerated claims and false promises which is no longer deserved."

Standardisation

There are five main MT approaches:
- Transfer based
- Interlingua based
- Knowledge based
- Example based
- Statistics based

Each approach has its limitations in capacity and dealing with types of linguistic phenomena. Over the past five years there has been a tendency towards language corpus development and the development of lexical databases with statistical and example based analysis applications. *Language International* has reported on several such language corpus projects and will continue to do so because these corpora, if standardised, will be the raw material for global MT development, *if* a standard linguistic description method can be agreed upon.

Professor Junichi Tsujii (UMIST, Manchester) argues for the integration of existing MT approaches and *Sergei Nirenburg* (Carnegie Mellon and editor of the journal *Machine Translation)* pleads for merging statistical and example based approaches with knowledge-based MT. A higher level of theoretical development seems necessary in order to overcome the differences in the users' needs for MT.

It is my impression that Japan currently has the greatest commercial need for MT (for export products) and consequently seems the least concerned with perfecting the linguistic output. Professor Nagao gave some survey results conducted in the far east: Successful MT-user sites have the following characteristics: input is in electronic form, the subject matter is highly focused, and customised dictionaries have been developed. Their break-even point for cost effectiveness seems to come after about 10,000 pages per year. There continues to be a problem with the quality of both input and output, but the advantages of MT appear to outweigh these problems.

Global collaboration

An obstacle to overcome is that some governments have invested much more in MT development than others and they may be reluctant to share their knowledge. Professor Nagao stressed that exchange of
knowledge and experts is essential for the future of MT and its efficiency. *Dr Loll Rolling* (Head of the EC Language and Technology division) reminded the conference that it was really difficult to convince the EC member States to invest in MT research and that, as a regional body, the EC's primary obligations lie within the region. He agreed that global collaboration would be useful but it could only be done if it did not require extra budgeting. An important role for the IAMT, he says, lies in the publication of national language plans in its Newsletter so that the members can spot overlap before duplication of efforts is made.

Professor Y.T. Chien of the US National Science Foundation, added that new digital computer networks allow for the efficient dissemination of large corpora and complex information and that the technology is there for effective global communication.

A look at the future

In the years to come it is expected that PC versions will be improved and larger systems released in PC format. Evaluation surveys that are currently in progress should be analysed and lessons learned.

The conference concluded in a passing of the presidency from Professor Nagao to *Dr Margaret King* (University of Geneva, ISSCO and President of the EAMT). *Muriel Vasconcellos* (President of the AMTA) remains Secretary and will take the Presidency in 1995. It was decided that Luxembourg will host the next MT SUMMIT V, 11-13 July 1995.

* With thanks to John Hutchins for his comments.

A short report on the TMI conference in Kyoto, by Colin Brace, will follow in issue 5/6