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7 • 5 Review on Machine Translation Summit (Post-Summit Discussion) - May 9, 1988

Participants: **Makoto Nagao** Kyoto University
Hozumi Tanaka Tokyo Institute of Technology
Akira Kubota Ministry of International Trade and Industry
Kazuhiro Fuchi Institute for New Generation Computer Technology
Akira Kikuchi Japan Electronics Industry Development Association

Kikuchi: I would like to express my gratitude to all of you for coming here in spite of your tight schedule. Last year, the 3-day Machine Translation Summit meeting was held at the Hakone Prince Hotel from Sept. 17 to 19, sponsored by Japan Electronics Industry Development Association and supported by the Ministry of International Trade and Industry (MITI), the Institute for New Generation Computer Technology (ICOT), the Center of the International Cooperation for Computerization (CICC), and the Japan Electronic Dictionary Research Institute, Inc. (EDR). As one of the sponsors, I believe that the conference was a great success with over 200 participants including 115 Japanese and 85 people from about 15 countries.

Today we have Prof. Nagao, the Conference Chairman, Mr. Tanaka, the Program Chairman, Mr. Fuchi, the Director of ICOT, and Mr. Kubota, an assistant division manager at MITI with us to look back on the Machine Translation Summit.

Now I would like to ask Mr. Nagao to start.

Nagao: To my greatest pleasure, the Machine Translation Summit, the first of this sort, was held in Japan and successfully ended with the support of MITI and other organizations. We use the word summit to emphasize the necessity for comprehensive trilateral efforts by engineers, users, and policy-makers in the research and development of machine translation. The development of this field requires the support of different governments along with international cooperation to achieve success.

The technological development had greatly ad-

vanced and was approaching practical application when the Machine Translation Summit was decided to be held in Japan to internationalize and vitalize the machine translation study.

Referring to the success of the Machine Translation Summit, I would like to ask all of you to express your comments and opinions on its significance.

Fuchi: Needless to say, the study of machine translation has a rather long history. The Electro-technical Laboratory, Kyoto University, Kyushu University, and other institutes have long been involved in its research and development. During its long history, there were upturns and downturns; the field of machine translation sometimes attracted people's attention, but often received harsh criticism.

Despite the trials and tribulations, the study has continued in Japan and has gradually spread to industry. Of course, it is still ongoing, and we are now witnessing the advent of a new generation, the generation of commercialized machine translation systems. I think the Machine Translation Summit was the first international conference of this sort and marked a footstep to move on up to the next step.

This conference will serve to further promote and urge basic research, along with the development of practical systems.

Tanaka: In the 1980s, research on machine translation and efforts for its commercialization are growing in Japan. Therefore, it was really timely that the first international conference on machine translation was

held in our country.

As Mr. Fuchi just said, research on machine translation has two major backbones: practical applications and basic research. In the U.S., researchers concentrated on natural language processing in the 1970s. Their success in the 1970s spurred research, in Japan and Europe in the 1980s. The Machine Translation Summit will greatly contribute to these successes in the future development of research worldwide.

Recently a decision was reached to continue the Machine Translation Summits. I hope they will continue to promote practical applications as well as basic research.

The 1st Machine Translation Summit, in this sense, marked the first breakthrough, and was characterized by many governmental projects and discussions from different points of view.

Nagao: A significant feature of the conference was discussions on the views of different countries on future research and development.

Kubota: I agree that this Machine Translation Summit resulted in active discussions and significant success, partly because it gathered many participants from many countries: 85 people from 15 countries. They respectively reported recent progress in their research and applications, and actively exchanged their ideas. The Summit can be evaluated highly even on an international basis.

Our technological standard in machine translation lies fairly high in the world. Despite undergoing favorable and unfavorable times, we have attained such a high standard by maintaining steady efforts on technological development.

In Japan, probably the largest driving force is a tenacious demand for a means to overcome the language barrier, something which has exhorted researchers and engineers to advance. Outstanding advances in electronics are also essential. In this field, we will maintain our high technological standards and work with other countries so that we can contribute to

the world's needs.

I hope the First Machine Translation Summit held in Japan will provide the momentum necessary to develop this field on an international scope.

Nagao: The success of the conference and the presence of so many international participants can be attributed to 10 or more Japanese companies, ICOT, CICC, EDR and other governmental projects, which served as magnets. Other countries may have had a great interest in what we were doing.

Kubota: Not a few people participated from neighboring China, Korea, and South-East Asian countries as well as the U.S. and European countries. Also in this sense, the conference was meaningful.

Nagao: The participants can be classified into three groups. The first group consists of people from neighboring countries, who have a firm determination to tackle this field. The second group consists of European countries who, like Japan, have suffered various hardships and currently have anxiety about an uncertain future. The last group is the U.S., which is not involved in machine translation, but wonders how it should be involved in it using its natural language processing technology. It is also interested in the activities of ICOT wondering how best to deal with it.

Fuchi: Machine translation was first established in the U.S. when the so-called Sputnik Shock induced people to learn Russian, though such efforts were later discontinued. Japan and European countries followed suit but continued through with their steady efforts.

Nagao: That is quite right.

Fuchi: Demands for machine translation are greater in Europe and Japan than in the U.S. For example, activities in EC requires a vast amount of translation. However, their projects such as EUROTRA, on which a great emphasis has long been placed, are now facing uncertainty in the future. Under such circumstances, the Machine Translation Summit is not considered a mere extension of conventional research, but serves to stimulate and set a starting point for the

future.

Development of machine translation is optimistically viewed in Japan with its practical applications only just started and basic research is being constantly conducted. However, frustration has spread around the globe due to several set backs.

The Machine Translation Summit may have a marked impact upon such an impasse. I wonder how great the responses will be.

Nagao: As Mr. Fuchi just said, the greatest meaning of the Summit would be that it has reconfirmed the importance of a global cooperative attitude.

Also meaningful were the displays and demonstrations, which deepened understanding of Japan's research and development. It was the first opportunity, even in Japan, that users reported their experience in witnessing machine translation.

Tanaka: Research and development in Japan by itself attracted worldwide attention. Unlike an ordinary international conference, the Machine Translation Summit contained demonstrations and first-hand experience such as input practice of sample sentences, thus strongly impressing participants from other countries.

One thing we have to keep in mind is that machine translation requires essentially long-term research. In accordance with this precept, EDR recently announced its project at the Machine Translation Summit.

The announcement showed for the first time that we are cooperating to help develop a dictionary vital since a dictionary is an integral part in machine translation and, at the same time, very costly. It received a great response and heightened the perception the basic research and collation of basic data are essential.

Participation by Asian countries beside European countries, the U.S., and Japan made the conference more meaningful.

In this sense, I hope that this Summit continues and provides a forum for discussion, ensuring intensive and extensive approaches: that is an intensive, focused approach and a somewhat shallower but more extensive approach.

Nagao: In fact, we have many things left to do, which I leave for later discussion. I would like to ask Mr. Kubota to comment on the significance of the Summit and involvement of South-East Asian countries.

Kubota: It was very meaningful that the report on progress by Japan, European countries, and the U.S. and the announcement about matters of concern of South-East Asian countries were brought to the fore.

The possibilities and necessities of international cooperation were pointed out during the Summit, and machine translation dealing with international languages seems to readily attract international attention. To this end, we should communicate with each other to grasp what others are doing. I hope the Summit becomes a beginning of facilitated communication.

With neighboring South-East Asian countries, the MITI, within the restraints of its budget, collaborates with them in the joint research of machine translation research. More desirable is that the project attracts people's interest and further heighten technical standards.

Nagao: The significance of the Summit really lies in Japanese open-minded attitude as shown in the presentations of machine translation activities and evidence of mutual cooperation.

A major secret lying under the success is efficient preparation by the Japan Electronics Industry Development Association, which established the machine translation study committee about 10 years ago.

Mr. Kikuchi, please comment on the conference in terms of preparation.

Kikuchi: The term, 'machine translation', first came to light about 10 years ago when the machine translation system was the subject of a research and

development project. This was several years before the establishment of ICOT's Fifth-Generation Computer Project. As many projects were proposed on machine translation, we asked Prof. Nagao to set up the machine translation study committee in cooperation with the Japan Electronics Industry Development Association.

The committee has been actively involved in research both overseas and domestically. The Machine Translation Summit was an epoch-making event for the committee.

The machine translation system requires not only research activities but also applications for following projects. As Mr. Kubota mentioned earlier, the CICC also paid attention to machine translation at that time, just coinciding with the second evaluation phase of the EUROTRA project and worldwide interest in machine translation.

Although you may touch upon this later, success of the succeeding Machine Translation Summits largely depends on development and prevalence of machine translation systems, elimination of language barriers between countries, and Japan's international contribution.

Kubota: Liaison with 85 participants of 15 countries must have been hard-work.

Saito: In planning, as we didn't imagine that such a great number of people would participate, the budget was originally based upon an estimate of 100 participants. Then the number was changed to 150 in planning and the invitations were sent. The final participants numbered 200, twice the original estimate, in which people from abroad accounted for about 40%. Such a high percentage of other foreign participants as well as participants from the U.S., South-East Asia, and China resulted largely from the activities of the fore-mentioned research committee.

Nagao: A chief reason for the success, CICC established the project and skillfully organized the participants from South-East Asia. Originally the attendance 30 foreign participants or 40 at most was con-

sidered to be satisfactory. The attendance of 80 participants can be attributed to the optimum environment, well-organized by CICC.

I gathered an impression from the conference that users of machine translation systems had grasped a rough idea about the machines currently in existence and their potential capabilities, and recognized some of the possibilities. The users now do not place too much expectations on machines and are apprised of their limitations.

Tanaka: That is quite right. When hearing the word, machine translation, people imagine that English sentences are automatically changed into Japanese. The limits of the existing technology is first understood the rough demonstration by people with an interest in machine translation, and in turn they convey the knowledge to other people.

Nagao: Actually the success of the machine translation depends on how well users can accept it. In this respect, many possible and impossible proposals were submitted at the Summit. We had many interesting contributions including complaints and suggestions.

Tanaka: Some users clearly expressed the limit of their systems and expressed very interesting views.

Fuchi: The existence of users itself is essential. Although researchers devised systems and tried to use them by themselves before, now users independently work and grasp the advantages and disadvantages of the systems. This also indicates the advent of a new generation.

Whenever a new project starts, optimism is first overwhelming, and it becomes popular among people but this lasts only a short period of time. However, beyond such a phenomenon, people objectively observe the limitation of the technology, and users try the system despite the limitations, forcing the technology up to the next level.

Nagao: Also in Japan, the machine translation technology has been upgraded, and users become

familiar with the system and squarely tackle with the problem of how to use it. If this trend continues to grow in Japan, the prospects of 2 or 3 years from now are very promising. During the Summit, European countries and the U.S., and the South-East Asian countries had slightly different concepts. Therefore, Japan should support all of the countries.

Kubota: Under the earlier-mentioned machine translation research project, Japan and the neighboring countries set up a 6-year project last year, aiming at nurturing cooperation in research and development. In the plan, we will help complete machine translation systems between Japanese and other languages such as Chinese, Thai, Malaysian, and Indonesian. Such joint research project will surely promote interest in the related countries and foster engineers and researchers. Japan, on the other hand, will receive a incentives to upgrade the current technological standard. Throughout the remaining 5 years, Japan will be in close touch with the neighboring countries.

In the meantime, we will be able to understand what and how much we can do, and also delineate difficulties and missing areas in research. Japan will take initiatives in Asia, and shoulder the responsibility to judge what is possible and what is impossible.

Nagao: In this sense, the ALPAC Report circa 1965 indicated pessimistic prospects, affecting the research and development. We may need another ALPAC Report from a different point of view.

Kubota: Looking at the upcoming machine translation research, we should clarify the form of practical applications and possibilities in research with the extant systems as well as setting targets in research.

The ALPAC Report, becoming notorious for its pessimism, is useful and helpful in evaluating how machine translation prevail in the societies when we place it in context among the current technology and demands. Such an approach is internationally required, and at the Summit whether it will prevail or not was a focal point of interest.

Japan should take initiatives to confirm the cur-

rent and future outlook of machine translation. Since considerable momentum in technological advance presides in Japan, we should convey it to China and other South-East Asian countries as well as to European countries and the U.S.. Without using mediums such as machine translation, technological transfer would face serious difficulties.

Kubota: I am often asked whether practical machine translation will be available, but it is not the question of all or nothing. The importance is not within its possibility of availability but its wide application range to various fields.

And the question of pre-editing and post-editing. If pre-editing will enhance the reliability of a machine translation system, the system itself can be supposed successful. I feel we may set such a target for future in detail.

Nagao: Yes. Then we can set guidelines including the full utilization of machine translation within certain parameters.

On the other hand, machine translation systems suffer from a lot of obstacles, which should be solved by ICOT or universities.

Fuchi: I return to the previous topic. As Mr. Kubota said, the all-or-nothing approach should be avoided. Generally speaking, standards in the evaluation of and attitude regarding the technology parallel the actual advance of the technology.

At the beginning of research, there are two extremes: people who think problems will be cleared up by the research; and people who think such difficult research can not be accomplished. These tendencies, seen in machine translation as well as other researches, can be thought as a preparatory stage for real technological development. In the preparatory stage, research and other efforts are generally insufficient.

The next stage does not lie in such extremes but within a whole spectrum between the extremes, in which we will set specific objectives and have actual problems in prevalence. Before this stage, the tech-

nology cannot be developed in real terms. In machine translation, for example, even an imperfectly versatile system can be applied in some ways and to some purposes. Such interpretations fluctuate markedly, but do approach a real evaluation.

For future development, in addition to objectives in machine translation research, an effective interdisciplinary dialogue with related techniques is essential. Machine translation research can be dealt with from the viewpoint of computer research or from the viewpoint of ICOT. Machine Translation shall have to become more advanced, and has to be equipped with more advanced functions. Our objectives lie in linguistic research and the preparation of a dictionary as well as research into computer hardware.

To achieve these objectives ICOT has undertaken the Fifth Generation Computer Project. Of course the project has many applications in addition to machine translation. I introduced one approach of the project in my speech.

Themes for future data processing by computer include machine translation. Although machine translation in itself is not their sole aim, and emphasis is placed instead on the computer, ICOT supposes the processing of natural and computer language is indispensable in computer research.

Especially dictionaries are difficult to deal with. Basic research requires a dictionary, and practical machine translation requires large electronic dictionaries. When the project began, the theme in dictionary research could not be easily defined. Inadequate definition might affect the entire balance of the project. Fortunately, however, there was one wise man in the MITI, who proposed to set up an independent project, as a result establishing the EDR. Therefore, EDR is placed under the Fifth Generation Computer Project in practical terms.

Fuchi: Independently from ICOT, the project, exclusively aimed at neighboring South-East Asian countries, has urged development of related technologies. Related technologies are regarded as organic systems.

To my wonder, the advanced countries are of the all-or-nothing type; that is they regard machine translation and computers separately, and make no inter-connection between them.

Japan is advanced favorably, if not ideally, of which we can be proud. To some extent, such respect can be understood by other countries through the Machine Translation Summit.

Nagao: In terms of research, machine translation may be included under natural language processing, and the private actively handled machine translation. Under the idea that the 21st century will be the information society using various language and concepts, private industries are actively involved in this field. Therefore the Japan Electronics Industry Development Association shall organize the industries and guide them in the proper direction.

Kikuchi: For the Machine Translation Summit, the name of the conference was originally planned to use the word congress, and I felt some discomfort with the name Summit. However, the leaders of this field gathered from various countries all over the world.

To encourage the acceptance of machine translation by people, we should form a forum to accept many people as a conference. The Summit just laid the cornerstone, gathering leaders to clarify priority of international cooperation in information exchange and spreading such a concept to contribute to the well-being of the nations as well as the related industries. Europe and the U.S. gave us various insights and information, and, in turn, we will relay that abroad, along with our own information on research and development. Like ICOT, whose research is open to the world, Japan Electronics Industry Development Association wanted to showcase technological development, and they were very glad that the intention was partly accomplished at the Machine Translation Summit. The demonstration at the Machine Translation Summit also contributed to heighten evaluations abroad.

Fuchi: I would like to express gratitude to the related companies. In Japan, large-scale research and development groups, established in companies, positively compete with each other. If they had concentrated only on a short-term competition, they would have been stopped in a deadlock. Instead they set long-term projects, which deserve high commendation.

The name Summit - I don't know who named it - gives me slight embarrassment but shows the determination of Japanese and foreign engineers. It also shows that in a rather long prospect, Japan properly carries out its responsibilities and is in the vanguard of the world.

Nagao: Yes. The Summit had an atmosphere different from past conferences.

Tanaka: The determination of the developmental engineers was also remarkable. Project leaders of various manufacturers were very friendly with each other over the telephone and cooperate very well with each other. In this respect, the project leaders in the machine translation industry are praiseworthy.

Nagao: Yes.

Tanaka: The EDR project, produced from ICOT was actually used and discussed, and the committee was also helpful. Such power of the research group in machine translation can be also demonstrated to the world.

Nagao: The forum for information exchange and discussion by machine translation-related people who have been in the industries for years cannot be imagined in other countries. Other countries' researchers may feel surprise and even envy of this opportunity.

However to be a little blunt, Japan is advanced in terms of technology, but surpassed by the U.S. in natural language processing and profound understanding of language mechanisms, and by European countries in glossaries and dictionaries. Each of the three parties

have their own advantage. How should those three determine the course of research for future?

Tanaka: Our research on natural language processing, which is a basis for machine translation, became progressively wider and more in-depth, leading to integrated machine translation. Machine translation requires international cooperation and must be capable of handling at least two languages.

Such a large-scale theme may advance through the efforts of an international research institute (combining Japan, Europe, the U.S., China and other South-East Asian countries) but not by individual activities. It cannot be accomplished immediately, but machine translation is a suitable opportunity to combine international efforts.

Nagao: While English is an international (exchange) language, Japanese projects such as the CICC project should deal with many languages in translating Japanese technical documents to other languages and vice versa. In some sense, Japanese can become an exchange language. Countries on the globe should cooperate to realize translations of various languages by machines. International approaches in translation and dictionaries as developed by EDR should be actively promoted. Of course, as Mr. Tanaka said, very tough problems exist, but such approaches are meaningful.

Kubota: In the information industry, we have a cooperative arrangement with the U.S. and Europe. I am not sure that machine translation should be incorporated in such an arrangement or dealt with in the field of natural language processing or dictionaries, machine translation. However, it seems to have a great possibility to be developed as a most appropriate and significant theme for an international corporation.

Tanaka: One important thing is the fact that various projects effectively interact like one large organic system. The Fifth Generation Computer Project, a multi-lingual translation project, and many others efficiently work in cooperation. Such an environment should be fostered in Japan.

Furthermore, the willing attitude to disclose results of research is necessary. We should not keep results secret but disclose to other countries.

Nagao: Yes.

Fuchi: Signs of an open attitude are beginning to be seen, but not sufficiently. Electronic dictionaries, studied by EDR, handle only English and Japanese, partly because of the limitation of their budget. Such a tendency may change with the cooperation of CICC. I believe we should not hesitate to spend money on dictionaries. Dictionary-making requires vast amounts of money and labor, resulting in exiguous research. Recently research has become more active but still not enough. We should consider dictionaries in multi-lingual forms.

And the people concerned should not keep the dictionary to themselves, but contribute to the world and let Japan play globally an important role. Before, there was an opinion that just following other countries was enough and disclosure of information should not be done. An open attitude and wider vision will lead to tackling language barriers all over the world. As time goes by, people continue to hesitate. I wonder how to cure such hesitation.

In addition, we should establish a basic research system for languages, cooperating with linguists domestically and internationally.

Nagao: I hope such a research institute will be established.

Fuchi: I think such an attitude is necessary. Actual establishment is a different matter, probably very difficult.

Nagao: Fortunately the 1st Summit ended as a success, and the 2nd Summit will be held in Munich, West Germany. The 3rd Summit may be held by Carnegie-Mellon University in the U.S. This field grows livelier worldwide.

Kubota: I want to ask one question. What kind of policy will EUROTRA take? I am very interested in

how their confidence is now.

Nagao: They finished the evaluation of the 1st phase and decided to proceed to the 2nd phase. Originally they wanted to establish a multi-lingual translation system, but various obstacles forced them to change the target to the promotion of research and development and practical applications. However, unlike in Japan, few manufacturers in Europe take every idea into consideration and so fail to realize practical applications in an optimum balance. Therefore, Japan must support the EUROTRA in various ways.

Tanaka: In this regard we need an international language research institute having various sub-projects. Laboratories of companies have some problems; for example, in disclosure of information. When a person joins ICOT, a non-profit corporation, leaving his or her company, the person disregards his or her capacity as a company employee. Companies usually cherish their private know-how. Is it the same in national institutes?

Fuchi: We should have neutral institutions such as ICOT. However, in the next step, companies should determine their own role, not guided by their government. ICOT is also still a semi-governmental body. Since Japanese industries grow, they should propose to establish a center just between private and official sectors. Then Japanese industries can further expand.

Saito: I agree with the opinion, but the recent high-tech industry is very closed to ensure national benefits. As Mr. Tanaka and Prof. Nagao pointed, we should understand the cultures and languages of other countries, and enter the grammars and dictionaries of the languages to be translated by our system.

In such a case, protection of proprietary right or a protective attitude will greatly affect the development of machine translation.

Fuchi: In some sense, a response by Japan may create a problem. Even when other countries try to protect their own technologies, we should not follow them. Japan can make dictionaries of other languages in certain fields.

Proprietary rights of information may cause a serious problem. It is important to protect such rights, but it will affect social investment and activities. There is too much egoistic proprietaryship in Japan. I hope machine translation is free of such a phenomenon.

Nagao: To this end we need active international interaction.

Saito: I hope such problems will be discussed at the 2nd Summit in Germany.

Tanaka: We may make a declaration that we will disclose our dictionary.

Fuchi: Free disclosure can raise profit, but profit-oriented attitudes cannot result in anything.

Nagao: The 2nd Summit has great significance in terms of international cooperation on machine translation in long-term prospectives. Topics to be selected and steps to it are also very important. We should contribute to it with concrete ideas.

Fuchi: Machine translation research is very active and benefits everyone concerned. Studies of dictionaries cannot be accomplished in a closed environment.

Kubota: I agree with Prof. Nagao. In the 1st Summit we reviewed the past and set the future course. The 2nd Summit, 2 years after the 1st Summit, may not be deemed successful if we only report the progress in the intervening 2 years. We should clarify our standing and plans more specifically.

Speakers of the 2nd Summit will take part as individuals, companies, groups, or organizations, and must have a unifying theme to indicate the Japanese attitude as a whole. In this respect, the committee of the Japan Electronics Industry Development Association can be utilized as a forum to set such Japanese attitude for the 2nd Summit. We have a little more than one year, and we may now concentrate on such a plan.

Nagao: Thank you for your various suggestion. Now may I have some personal observations?

Kubota: Well, such a magnificent conference was very meaningful. The receptions were also well-organized. Everything was worthy for the 1st.

Compared with our past way, it was really large scale in terms of the way of thinking.

Kubota: Yes. We can be proud of holding such a great conference.

Nagao: Really fruitful.

In an optimum environment, creative ideas can emerge, and vigorous discussions can be held. The Summit was not only an occasion for the participants to announce their individual developmental progress, but also a forum for discussion.

The time has come to close this discussion.

Thank you very much for your active participation.