Session 5
Product Forum

Summary of discussion

David Beattie and John Stowell

With Catriona Picken in the chair, the panel for this session comprised the following:

- Merle Tenney
  Product Manager, Automated Language Processing
  Systems (ALPS)
- Ralph E. Hawes
  Executive Vice President, Logos Corporation
- Dr F.W.A. Habermann
  Karlsruhe Nuclear Centre Systran User
- Stephen Kerce
  Manager, Linguistic Development, Weidner
  Communications Corporation.

Each panel member was invited to give a brief presentation on new product developments introduced over the past twelve months.

MERLE TENNEY (ALPS)

ALPS offers a highly flexible range of translation tools, with the emphasis on present deliverability rather than future promises. With its multilingual word processing capability, ALPS can display and print every Roman and Cyrillic character set. In fact, ALPS is based on word processing and the translation tools have been developed in the context of the word processor Other capabilities can be added into the system at each stage of the translation process, including useful access to online dictionaries. ALPS operates

on four levels:
1. Multilingual word processing
2. Selective dictionary look-up
3. Automatic dictionary look-up (ADL)
4. Computer translation systems.

These facilities make ALPS the only interactive system on the market at present, enabling the translator to intervene and complement the computer in producing the first draft.

The dictionary facilities offered by ALPS enable users to add their own dictionary to the base-form starter dictionary. There is no limit to the size of the dictionaries thus created, and these can be tailored to the user's own needs or to a specific document. Prioritised dictionaries can be merged and it is possible to access single words or whole expressions. The ALPS dictionaries are characterised by simplicity of construction, and are easy to create, maintain and use.

ALPS 'deliverables' include French, German, Spanish and Italian programs at present. The system can also be interfaced with other computers and word processors (without the need for re-keying) and with a number of photo-typesetting configurations to permit production in the target language in the original format of the source language.

Following lengthy gestation at the Brigham Young University, ALPS as such came into being five years ago. A large R&D department is continually striving to enhance the system, with the emphasis on customer support and satisfaction, coupled with the provision of flexibility for the translator. ALPS is committed to this path for the future and is now in Europe to stay, with European headquarters recently established in Neuchatel, Switzerland.

RALPH E. HAWES (LOGOS CORPORATION)

Logos is a fully automated translation system, possessing great semantic power but with few language pairs at present. The human translator is involved at the post-editing stage. Three new features were described.

Formatting

Highly formatted text has always presented significant technical problems, especially on the output side. These problems have now been resolved at Logos and the system is capable of faithful on-screen representation of highly formatted texts in the target language. This feature saves time and effort at the post-editing stage.

Translation quality

The calibre of the Logos system has been improved in terms of usability and readability. Scored on a scale from 0 (= non-translation, unusable) to 5 (= absolute perfection), the quality of a corpus of 1,000 sentences has improved markedly over the two years since the introduction of the Logos system in November 1982.

Customer productivity

A survey was presented based on six customers who had installed Logos over the past twelve months; the system could now be described as 'fully operational' in each of these locations. The nature of the material being handled by these customers included technical product information, contracts, legal texts and data processing manuals. Logos translates 1,000 words per hour, and post-editing speeds were found to range from 15 to 25 pages per day. (A scaled-up speed of 60-70 pages per day has been achieved, but this rate can be sustained for only a few hours at a time.) The number of words added by these customers to the core dictionary has varied from 3,500 to 15,000. The survey illustrated the average volume of lines translated per month and showed the steady rate of improvement achieved.

DR F.W.A. HABERMANN (SYSTRAN USER, KARLSRUHE NUCLEAR CENTRE)

For many years scientists at the Karlsruhe Nuclear Centre have co-operated closely with the French on the development of fast-breeder reactors. Given the large number of French reports being received in Karlsruhe, the potential of machine translation in this area was first investigated in 1979. The result was a small development project in co-operation with the European Commission. The Systran program for translation from French into English was received from Luxembourg in exchange for feedback on technical vocabulary and general suggestions for improving the Systran program.

The objective of the project was to demonstrate that fully automatic MT could be used for the transmission of scientific information. Against this background, the following restrictions were imposed:

1. MT was limited to informative scientific texts only
2. MT was non-interactive French-to-English only
3. There was no post-editing of raw MT output (left to the end-user).

Although some 10,000 technical terms from the nuclear field have now been entered into the Systran dictionary, and although the European Commission has improved the Systran program considerably in recent years, complete reliability of information transfer has not yet been achieved.

If MT at the Karlsruhe Nuclear Centre is to be successful, it needs to be much faster than conventional human translation. It has been the Karlsruhe experience that the human operations in the MT process (manual text input at 3-5 pages per hour, post-editing at 2-5 pages per hour) are several orders of magnitude slower than the machine operations. It is believed that, in the context of the fast-breeder reactor project, the full benefits of MT will only be realised if these human operations can be kept to a minimum. Hence, there is lively interest in using an optical character reader (OCR) to make the printed texts machine-readable, thus accelerating textual input. The Karlsruhe Nuclear Centre considers that, for its purposes, it is the role of the translator to improve the computer program, and not to perform routine tasks such as translation or post-editing. In support of the intention to set up an MT service without post-editing, the comprehensibility of Systran output was reported to have improved since the adoption of the system, with totally incomprehensible sentences having diminished from 6 per cent in 1980 to 2 per cent in 1984.

The flow diagram in Figure 1 illustrates how the Karlsruhe Nuclear Centre would like to organise its MT effort in the future. Figures 2 and 3 show examples of MT with Systran.

STEPHEN KERCE (MANAGER, LINGUISTIC DEVELOPMENT, WEIDNER COMMUNICATIONS CORPORATION)

The latest developments at Weidner were summarised as follows.

Hardware developments affecting delivery to the user

The Weidner computer-aided translation (CAT) system has been linked to a range of standard hardware options, thus satisfying a multiplicity of differing requirements. The advent of the IBM PC AT means that Weidner's MicroCAT will run at double the speed with only a minimal increase in cost. The Weidner MacroCAT system uses large mainframe computers such as the DEC PDP 11 or Vax series CPU. Hardware independence has not yet been achieved.
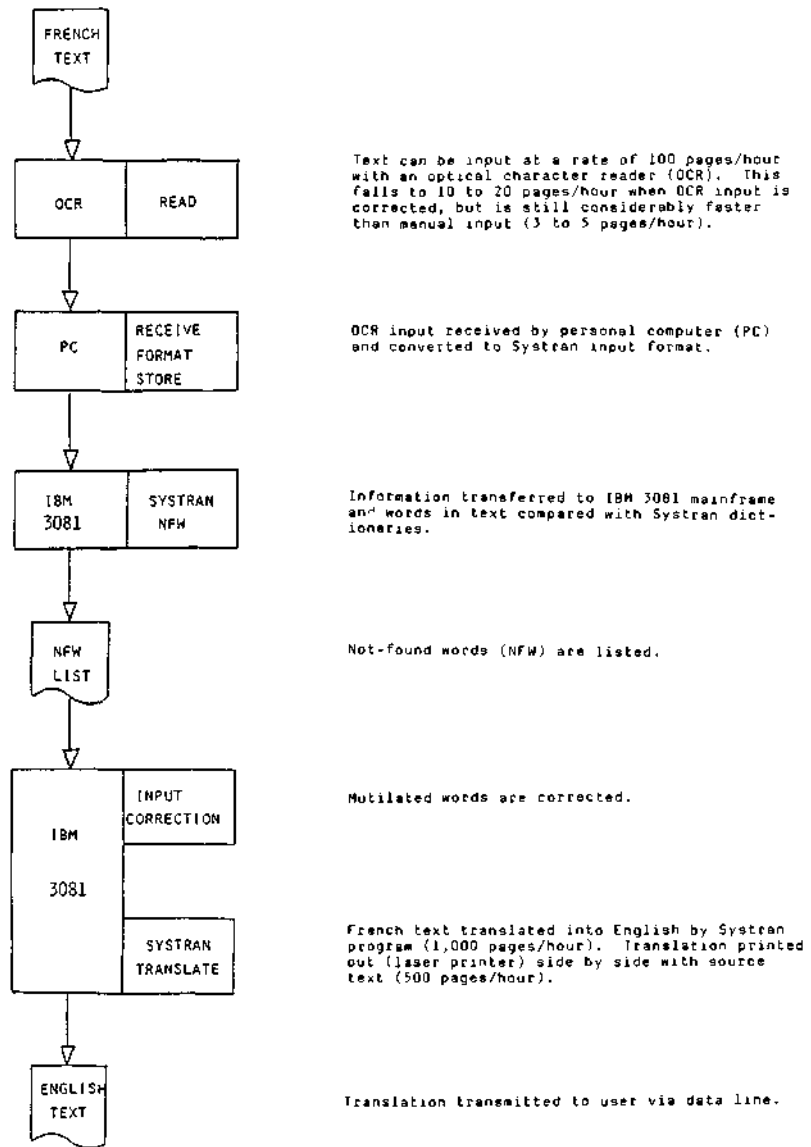
Figure 1. Flow diagram illustrating the future organisation of MT at the Karlsruhe Nuclear Centre

TYPICAL EXAMPLE OF MT WITH SYSTRAN

SYSTRAN II   SIDE-BY-SIDE   PROJEKT SCHNELLER BRÜTER
                                                                                            KFK, KARLSRUHE, SEPTEMBER 1984

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397   l' analyse de l' essai CABRI B1 était difficile en raison   397   The analysis of the CABRI test B1 was difficult owing to the
      des effets bidimensionnels du mouvement et de la   two-dimensional effects of the movement and of the
      perturbation apportée par la cage de centrage. Le code a   perturbation brought by the cage of centering. The code
398   retrouvé l' instant et l' endroit où s' amorce le mouvement   398   found the moment and the place when starts the movement and
      et le fait que celui-ci est d' abord ascendant. La   the fact that this one is initially ascending. The
399   propagation du front de fusion et la hauteur de la zone   399   propagation of the front of fusion and the height of the
      fondue ont été calculées à 7 % près. De plus comme dans l'   melted zone were calculated with a margin of 7 %. Moreover
400   expérience on constate que la relocalisation se fait à l'   400   as in the experience it is noted that the relocalisation is
      intérieur de la zone fondue, c' est-à-dire dans la partie   done inside the melted zone, i.e. in the fissile part (small
      fissile (faible pénétration de l' acier liquide sur la gaine   penetration of molten steel on the intact clad) and that the
      intacte) et que les centreurs constituent une zone de   centring devices constitute a preferential resolidification
      resolidification préférentielle. Par contre le calcul n' a   zone. On the other hand calculation did not find the fusion
      pas retrouvé la fusion des centreurs qui a pourtant été   401   of the centring devices who however was observed. In
401   observée. Par ailleurs on peut vérifier sur la figure 32   402   addition one can check on figure 32 only if the size of some
402   que si l' emplacement de certains bouchons est correct, d'   plugs is correct, others were not found; but this is
      autres n' ont pas été retrouvés; mais ceci est lié à des   403   connected with characteristics of the experience who will
      particularités de l' expérience qui ne se retrouveront pas   not be found in reactor. One thus can consider that these
403   en réacteur. On peut donc considérer que ces essais ont   404   tests allowed to qualify the ALFA code; complementary tests
404   permis de qualifier le code ALFA; des essais complémentaires   405   will make it possible to specify the effect of the centring
      permettront de préciser l' effet des centreurs (essais   devices (MONOBRI tests) and of the irradiation (CABRI
405   (MONOBRI) et de l' irradiation (essais CABRI). Par ailleurs   tests). In addition they allowed to draw up several points
      ils ont permis d' établir plusieurs points dont nous verrons   406   of which we will see the importance for the application to
406   l' importance pour l' application au réacteur;   the reactor;

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Figure 2.   Typical example of MT with Systran

FAVOURABLE EXAMPLE OF MT WITH SYSTRAN

SYSTRAN II SIDE-BY-SIDE PROJEKT SCHNELLER BRÜTER, KFK, KARLSRUHE, SEPTEMBER 1984

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Dans B) au contraire par suite de la déformation de la gaine, la pression interne a été réduite à une valeur très proche de la pression régnant dans le canal. La masse éjectée est alors inférieure à 1 g, valeur qui ne peut être vérifiée expérimentalement puisqu' elle se situe au-dessous de la limite de sensibilité de l' hodoscope. Néanmoins, en l' attente du résultats de confirmation, nous pouvons considérer le calcul d' éjection comme correct.

En ce qui concerne l' interaction on admet que la masse de combustible éjectée se fragmente instantanément et que la zone d' interaction est homogène en température, pression et taux de vide, les deux paramètres du calcul sont le rayon des grains (actuellement pris égal à 100) et la hauteur de la zone d' interaction ZI. Dans le cas de A3 la valeur ZI = 10 cm permet de retrouver correctement l' évolution du débit supérieur et le début de l' évolution du débit inférieur (figure 35). Par contre c' est la valeur ZI = 1 qu' il faut utiliser pour obtenir le même type de résultats dans B3 (figure 36).

La même tendance se retrouve en ce qui concerne l' évolution

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503 In B3 on the contrary in consequence of the deformation of the clad, the internal pressure was reduced to a value very close to the pressure reigning in the channel. The ejected

504 mass is then lower than 1 g, value who cannot be checked in experiments since it is located below the limit of sensitivity of the hodoscope. Nevertheless, in waiting of

505 results of confirmation, we can consider the ejection calculation like correct.

506 With regard to the interaction it is admitted that the ejected fuel mass splits up instantaneously and that the interaction zone is homogeneous in temperature, pressure and rates of vacuum. Both parameters of calculation are the

507 radius of the grains (currently taken equal to 100) and height of the zone of interaction Zi. In the case of A3 the

508 value Zi = 10 cm makes it possible to find correctly the evolution of the higher flow and the beginning of the evolution of the lower flow (figure 35). On the other hand

509 it is the value Zi = 1 that it is necessary to use to obtain the same type of results in B3 (figure 36).

510 The same tendency is found with regard to the evolution of

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Figure 3. Favourable example of MT with Systran

Software developments

There are currently seven language pairs. German to English has now been released in the USA and Japan and will soon become available in Europe. English to Italian will arrive early in 1985.

Translation services

In conjunction with the development of its English-to-Arabic program, Weidner has just signed an agreement with a company in Saudi Arabia regarding the establishment of translation service bureaux in the Arabic-speaking world. The initial translation requirement is for 15 million words per month. French-to-Arabic and German-to-Arabic language pairs are scheduled to follow shortly.

QUESTION TIME

Asked to define more closely the nature of the improvements which have caused the overall comprehensibility of Systran output to rise from 75 to 98 per cent by 1984, Dr Habermann emphasised the addition of technical vocabulary to the extent that very few areas are now not covered. There are now fewer errors due to missing terminology. He also commented that the Systran program had been improved, but admitted that further refinement would be required if linguistic and syntactical problems were to be overcome. Such improvements would bring greater accuracy at the expense of translation speed, which is unnecessarily high in any case. Before Systran, scientists at the Karlsruhe Nuclear Centre either read the French reports in the original language (50 per cent) or requested a human translation (50 per cent). Whereas pre-Systran human translation was usually attended by delays of between one and three months, it is now possible for 20 pages to be translated and ready for use within a few hours.

One delegate asked whether the interactivity feature of ALPS is a necessity or an option, and whether the purpose of interactivity is in fact to eliminate post-editing altogether. Mr Tenney replied that while interactivity can be turned 'down' (reduced), it cannot be turned 'off' (eliminated). Output is improved by using the interactive capability and less time is required for post-editing.

On the question of preserving original text format in cases where source and target language differ in length, the panel concurred that this is not a difficulty with running text. However, problems can arise with copy which has to fit a specific space, and some editing may be necessary

(ALPS). Tabulation work is the most difficult area, but by applying logical procedures it is possible to subtend the overflow in the same column without wrap-around (Logos).

The subject of the comprehensibility of MT output was raised by another questioner, who wished to know whether any external or independent assessment is applied in this context, and whether 'comprehensible' in fact includes 'dreadful but understandable output', rather like the efforts of a non-native speaker.

Mr Kerce (Weidner) commented that ideas on comprehensibility vary from translator to translator. For Weidner, the ultimate objective is to produce human quality translation after post-editing. The comprehensibility of Weidner's raw MT output is measured in terms of the time taken and the work required to achieve this goal. Weidner has found that editors <u>are</u> able to produce a usable document rapidly and cost-effectively with its system.

Human quality translation is not the aim at the Karlsruhe Nuclear Centre where Systran output is merely used for the transfer of scientific information. The uninitiated are frequently unable to understand portions of low-quality Systran output.

Mr Hawes (Logos) admitted that there is much controversy over perfect output and referred to an internally determined 'usability index' at Logos, the principal criterion for which is simplicity.

ALPS differs psychologically from the other systems in that it is interactive rather than automatic. The human translator is in control at all times and can correct the computer, or drop back to automatic dictionary look-up or to multilingual word processing.

The panel was next asked whether the changes which became necessary at the post-editing stage were implemented mainly to improve the lexical or the grammatical quality of translation output. The need for lexical changes was reported to be greatly reduced with ALPS, with the result that the human translator can concentrate on eliminating 'noise' problems (introduction of definite/indefinite article, repositioning of adverbs etc.) and on cleaning up superficial aspects. With Logos there is an approximately equal split between lexical and syntactical post-editing. No concerted effort is made to post-edit Systran output at the Karlsruhe Nuclear Centre; at present, only the most glaring errors are corrected. With the Weidner system, post-editing focuses on syntax and grammar. Lexical problems are minimal but some effort has to be expended on rewriting in a less literal manner.

One questioner asked for comments on the semantic competence of the various systems. With ALPS the semantic aspect is resolved mostly at the lexical level, i.e. in

individual expressions. The semantic features of the system are enhanced by prioritised dictionary selection (a particular dictionary for a particular document) and by the interactive review capability of ALPS. Logos is rich in semantic capability with the result that a translation can be 'biased' by instructing the system to use a particular subject matter code (or the nearest code). If a term is not found in the specialised dictionary, Logos will then search in the general dictionary. Logos has incorporated some 32,000 semantic rules into its system to date and these cover over 90 per cent of all eventualities. It is thought that the corpus of semantic rules will grow to approximately 100,000, with the 70,000 new rules being applicable to less than 10 per cent of cases. Systran has many built-in semantic rules (precise data not available), but inaccuracies remain and the system is not 100 per cent reliable, and possibly never will be. The Weidner system is able to influence semantic parsing, but this is limited to the sentence level (restricted textual domain). It is not possible for the machine to understand the whole text and so the system will necessarily rely on human post-editing for the future.

The panel members were then asked to identify their main market segments and to highlight any possible applications of their systems for the small user requiring only one language pair.

ALPS has tended in the past to concentrate on larger organisations because of the obvious gains in that sector. However, the falling prices and increasing capabilities of the personal computer are certain to usher in a trend towards the small user. Suitable hardware can now be purchased for $12,000.

Because of its dictionary-building capability, Logos is primarily suited for use in translating technical documentation which is factual and clearly written. Developments in the communications market will mean that source language input can be delivered in target language. Another major market segment for Logos is the field of office automation, and a fourth market would be 'information translation', i.e. material which would only be translated if the human translator has time (however, this particular area is extremely difficult to assess). Finally, with reference to the small user, there might be some possibility of marketing Logos on the IBM PC AT.

Systran output from the Karlsruhe Nuclear Centre could be made available to other scientific institutions.

Weidner can be used most profitably by organisations requiring translation of a high volume of technical documentation with restricted and consistent vocabulary. There is also an application in smaller organisations with an IBM PC XT/AT, again provided that documentation is

consistent. Groups of translators might use such a system since Weidner can be networked to PCs. A third area is the Weidner translation service bureau with an MT core: this would save companies the cost of investing in hardware.

Given that many international standards and normative texts remain virtually unaltered when new versions are issued, one delegate asked whether any work was in progress on a system which could distinguish new text from old, and translate only the new material, a feature which would eliminate much tedium. The message from the three commercial panel members was 'Yes - stay tuned!'

Editor's note

In connection with the discussion on the quality and comprehensibility of machine translation, I am indebted to Loll Rolling of the EEC Commission for drawing to my attention a comprehensive report entitled Critical study of methods for evaluating the quality of machine translation, prepared for the Commission's Directorate General Scientific and Technical Information and Information Management by Bureau Marcel van Dijk, Ingénieurs Conseils en Méthodes de Direction, Avenue Louise 409 Bte 1, 1050 Brussels, Belgium.