Technology as Translation Strategy

American Translators Association
Scholarly Monograph *Series*

Volume II 1988

EDITED BY

Muriel Vasconcellos

State University of New York at Binghamton (SUNY)

Copyright © State University of New York at Binghamton (SUNY) 1988

ISSN 0890-4111

Printed in the United States of America

Editor's Notes

Translators may be surprised to learn that the idea of using machines to facilitate the translation task has been around for a very long time. Already more than half a century ago inventors were at work on machines that would effect the transfer from one language to another.[1] In as early as 1933 a patent was granted in France to Georges Artsruni for his "mechanical brain" that could replace words or combinations of words with equivalents retrieved from a target dictionary. Also, in that same year, P.P. Trojanskij, working in the USSR, proposed a complete translation process that would be largely automatic. Words were to be entered in a source dictionary together with "logical analysis marks" and then paired with their equivalents in a target dictionary, which also had their associated marks. An input text, matched word for word against the source dictionary, would undergo analysis and, based on the information from the analysis marks, be converted into logical form. An automated lookup would then retrieve, for the elements in logical form, their corresponding equivalents in the target dictionary, and the grammatical forms would be generated automatically, based on the marks assigned to each entry. Trojanskij envisioned that human beings would be needed at the front end, to supply the words and the logical marks for the dictionary, and at the output end, to modify the text so that it would have the characteristics of natural language. Trojanskij's model is in fact a clear and accurate description of machine translation (MT) as we know it today. The process was not to become a reality, however, until computer science itself caught up with his vision.

Each major leap of progress in the history of MT has come quickly on the heels of a breakthrough in computer technology. The first ex-

periments were undertaken in the early 1950s, less than a decade after the ENIAC made its debut. But computers up through the late 1960s were limited in terms of both space and processing power; astronomical rates were charged for every minute of time used; and programmers, who wrote their programs in arcane formulations of assembler language, were paid premium fees for work by the hour. Moreover, MT in particular was constrained by the bottleneck of text input, which had to be done by hand.

By the 1970s, however, advances began to take place which were to make MT a more attractive prospect. Miniaturization provided the space needed for large and complex dictionaries, and it also made processing more efficient by orders of magnitude, thus allowing for the complex rules and decision branches that are required for the interpretation of natural language. In addition, higher-order programming languages turned programming into a more accessible activity. At the same time, progress in optical character recognition (OCR) made text input for MT an easier task. And finally, the general availability of word processing (WP) created the possibility for large volumes of text to be already in machine-readable form, as well as for MT output to be easily postedited.

But changes in the human environment were to shape the unfolding of events even more than the factors of technology. Translators in the 1950s saw the limitations of MT. In principle, they rejected the dehumanization of one of the highest forms of human activity, and they cited the awkwardness and sometimes incomprehensibility of the output, as well as the very real costs of input, dictionary-building, algorithm development, and postediting. They saw themselves being replaced—and stupidly, by a technology that was both costly and inadequate—and they bitterly resisted its introduction. In response to their protests, hearings held by the U.S. Congress reviewed the issues at stake and asked the basic question of "whether the machine could capture the living essence of a language, ... the myriad idiomatic constructions, ... the culture and the thinking and personality of the persons who are speaking" (Congressman King, U.S. House of Representatives).

The climate generated by the anti-MT movement culminated in the 1966 report of the Automatic Language Processing Advisory Committee (ALPAC), a group appointed by the U.S. National Academy of Sciences to study the feasibility of MT (see Vasconcellos in this vol-

ume). The conclusion of ALPAC was that fully automatic high-quality machine translation (FAHQMT) was impossible, that investments in MT research were ill-advised, and that linguists should be devoting their time instead to basic research in linguistic theory and to the development of lexical data bases for machine-*aided* translation (MAT). ALPAC was to cast a pall over MT activities throughout the world and put an end to almost all public-funded MT research in the United States up to the present day.

In the years immediately following ALPAC it happened that scientific linguists, spurred by the innovative approaches of Noam Chomsky,[2] took up with great intensity the examination of principles of language that had eluded them before. They also learned how to write computer programs, and they formed a new discipline, called *computational linguistics*. At the same time these years saw the establishment, with the collaboration of professional translators, of lexical data bases in bilingual Canada and polyglot Europe—initiatives possible thanks to the growing storage capacity of computers, their wider availability, and the lower cost of computer time.

A few MT activities continued to be carried on during the decade that followed ALPAC. The most important practical applications were the Russian-English systems implemented in the United States at the Atomic Energy Commission, Oak Ridge National Laboratory, Tennessee (Georgetown Automatic Translation) and at the U.S. Air Force Foreign Technology Division, Wright-Patterson Air Force Base, Ohio (Systran). But it was not until the end of the 1970s that MT was to become commercially viable, though still only for large installations. Systran had begun to expand, and Logos and Weidner were appearing on the scène.

The widespread availability of word processing, which became a fact of life at the turn of the decade, was a boon not only for MT but also for the individual translator, whose own input task suddenly became much easier. This was the first technological advance that the individual translator could relate to personally, since the lexical data bases were still restricted to large institutions. Word processing, moreover, could be tied to a new product on the market, offered by ALP Systems, which provided tools for the building of customized dictionaries for smaller installations. Today, it is estimated that one in every two translators uses word processing.[3] Among free lances, 80% use PCs, word processors, or electronic typewriters.[4]

Finally, the late 1980s have brought about the fruition of all these trends– and a synthesis whereby the different technologies are being used increasingly in combination. Word processing is now readily available for the individual translator, computers are affordable, and small lexical data bases can be developed easily. The latest development is the widespread use of telecommunications, which enables the translator, working in his "cottage" or a shared environment, to exchange messages and texts with colleagues, clients, and home offices in similar circumstances the world over. And finally, full MT systems within the translator's price range and storage capacity are fast approaching maturity. The first system to run on a personal computer was Weidner's MicroCat, and others are appearing rapidly (see Shaefer in this volume).

The papers that follow tell the story of a profession that is responding in a number of different ways to the advances in computer technology–of professionals who are streamlining their work, reducing repetitive tasks, eliminating manual operations, and in general increasing their productivity while at the same time achieving a more interesting and relaxed environment.

The intention here is to present a smorgasbord of possibilities. Different translators will opt for different dishes, different combinations, different sauces. But increasingly they are coming to the table to partake of the feast.

Clarification

This book has been written for *the translator*, not translators in general–in other words, a single human being, who in English must be characterized as either *he* or *she*–or *s/he* if one is willing to sacrifice one's train of thought. Faced with the issue of what gender to assign to this important professional, the editor has heeded the majority voice of the contributors as well as the natural evolution of the English language: the translator has been characterized as *he* throughout the book. This is a metaphorical and linguistic *he*–a *he* that is deeply engrained in the fiber of English, much like gender is in some other languages–and does not negate the fact that the female sex is well represented in the profession.

Acknowledgments

The guest editor wishes to express her appreciation for the time, effort, and, yes, even money that have been given so willingly by all the colleagues who have come forward with contributions and other assistance in the preparation of this volume. Special thanks go to Veronica Lawson and Alan Melby for their technical advice and continuing support throughout the preparation of the volume, and of course to Marilyn Gaddis Rose, editor of the *Series*, who managed the long-distance project with great thoroughness, efficiency, and patience.

M.V.

NOTES

1. The work of Artsruni and Trojanskij is described by Zarechnak.
2. While Chomsky's *Syntactic Structures* appeared in 1957, it was his *Aspects of the Theory of Syntax*, in 1965, that provided the impetus for a generalized reconfiguration of the science of linguistics.
3. Figure cited by Lehmann from a report on the meeting of the Quebec Translators Association (October 28, 1986).
4. Figure from *Translation Practices Report*. Reading (England): Engineering Division, Digital Equipment Co. Ltd., 1986.

REFERENCES

Chomsky, Noam. *Syntactic Structures*. The Hague: Mouton, 1957.

Chomsky, Noam. *Aspects of the Theory of Syntax*. Cambridge, MA: MIT Press, 1965.

U.S. House of Representatives, Committee on Science and Astronautics. *Hearings . . . Research on Mechanical Translation*, Eighty-sixth Congress, May 11, 12, 13, and 16, 1960. Washington, D.C.: GPO.

Zarechnak, Michael. "The History of Machine Translation," in *Machine Translation*. Božena Henisz-Dostert, R. R. Macdonald, and Michael Zarechnak. The Hague: Mouton, 1979. Trends in Linguistics, Studies and Monographs 11, 1979. pp. 1–87.