

The Georgetown-IBM Experiment Demonstrated in January 1954

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Abstract. The public demonstration of a Russian-English machine translation system in New York in January 1954 – a collaboration of IBM and Georgetown University – caused a great deal of public interest and much controversy. Although a small-scale experiment of just 250 words and six ‘grammar’ rules it raised expectations of automatic systems capable of high quality translation in the near future. This paper describes the system, its background, its impact and its implications.

1 The Impact

On the 8th January 1954, the front page of the *New York Times* carried a report of a demonstration the previous day at the headquarters of International Business Machines (IBM) in New York under the headline „Russian is turned into English by a fast electronic translator“:

A public demonstration of what is believed to be the first successful use of a machine to translate meaningful texts from one language to another took place here yesterday afternoon. This may be the culmination of centuries of search by scholars for „a mechanical translator.“

Similar reports appeared the same day in many other American newspapers (*New York Herald Tribune*, *Christian Science Monitor*, *Washington Herald Tribune*, *Los Angeles Times*) and in the following months in popular magazines (*Newsweek*, *Time*, *Science*, *Science News Letter*, *Discovery*, *Chemical Week*, *Chemical Engineering News*, *Electrical Engineering*, *Mechanical World*, *Computers and Automation*, etc.) It was probably the most widespread and influential publicity that MT has ever received. The experiment was a joint effort by two staff members of IBM, Cuthbert Hurd and Peter Sheridan, and two members of the Institute of Languages and Linguistics at Georgetown University, Leon Dostert and Paul Garvin.

2 The Background

Léon Dostert had been invited to the first conference on machine translation two years before in June 1952. He had been invited for his experience with mechanical aids for translation. Dostert had been Eisenhower’s personal interpreter during the war, had been liaison officer to De Gaulle, and had worked for the Office of Strategic Services (predecessor of the Central Intelligence Agency). After the war he designed and installed the system of simultaneous interpretation used during the Nuremberg war crimes tribunal, and afterwards at the United Nations. In 1949 he was invited to

Georgetown University to establish the Institute of Languages and Linguistics at the University's School of Foreign Service for training linguists and translators primarily for government service [10].

Dostert went to the conference as a sceptic but returned as an enthusiast determined to explore the possibilities of machine translation. It was his conviction that MT needed to demonstrate its feasibility in a practical experiment. For obvious political reasons Dostert decided that the demonstration should translate from Russian into English; the lack of knowledge about activities in the Soviet Union was already a major concern in US government circles.

Dostert contacted a personal acquaintance, Thomas J. Watson, founder of IBM, and they agreed to collaborate. The project was headed by Cuthbert Hurd, director of the Applied Sciences Division at IBM, and Dostert himself. The linguistic side of the experiment was the work of Garvin, a Czech linguist (associate professor) at the Institute – see Montgomery [6] for a biography. The computer programming was done by Peter Sheridan, staff member of IBM.

The Georgetown pair decided to demonstrate translations on a small number of sentences from organic chemistry and some others on general topics, which would illustrate some grammatical and morphological problems and give some idea of what might be feasible in the future. The experiment was to be small, with a vocabulary of just 250 lexical items (stems and endings) and a limited set of just six rules.

3 The Demonstration

Reports of the demonstration appeared under headlines such as „Electronic brain translates Russian“, „The bilingual machine“, „Robot brain translates Russian into King's English“, and „Polyglot brainchild“ – at the time computers were commonly referred to as ‘electronic brains’ and ‘giant brains’ (because of their huge bulk).

The newspapermen were much impressed:

In the demonstration, a girl operator typed out on a keyboard the following Russian text in English characters: „Mi pyeryedayem mislyi posryedstvom ryechi“. The machine printed a translation almost simultaneously: „We transmit thoughts by means of speech.“ The operator did not know Russian. Again she types out the meaningless (to her) Russian words: „Vyelyichyina ugla opryedyelyayatsya otnoshyenyiyem dlyini dugi k radiusu.“ And the machine translated it as: „Magnitude of angle is determined by the relation of length of arc to radius.“ (New York Times)

It appears that the demonstration began with the organic chemistry sentences. Some of these were reported, e.g.

The quality of coal is determined by calory content

Starch is produced by mechanical method from potatoes.

but the journalists were clearly much more impressed by those on other topics:

And then just to give the electronics a real workout, brief statements about politics, law, mathematics, chemistry, metallurgy, communications, and military affairs were submitted in the Soviet language... (Christian Science Monitor)

All the reports recognised the small scale of the experiment but they also reported future predictions from Dostert: