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# "BABELFISH" in the XXI CENTURY – INNOVATIVE SOLUTIONS USED in TRANSLATION and INTERPRETATION

## Introduction

In the collection of books recognized by Jews and Christians as divinely inspired writings, commonly known as Bible, there is a story concerning the reasons for the use of different languages in the world. We can read there that initially "(…) the whole world had one language and a common speech." Thanks to this they could easily cooperate, which was reflected in the building of the city and the tower (the so-called Babel). This fact, according to the message of the Bible, worried God, because "(...) If as one people [were] speaking the same language (...) then nothing they plan to do will be impossible for them." He decided – "Come, let us go down and confuse their language so they will not understand each other." [2 - 11,1-9] The Tower of Babel is therefore a symbol of confusion - the variety of languages present in the world that make global communication difficult.

The biblical tale became an inspiration for the 20th century author of the humorous science-fiction book "The Hitchhikers Guide to the Galaxy " – Douglas Adams, who equipped his characters, who travelled around different planets, with a system for translating foreign languages – the so-called " Babelfish". It was a living organism – a species of fish equipped with the ability to translate. When it was inserted into the ear, it gave the protagonists of the novel the ability to understand the languages of the species inhabiting other planets. [3]

Unfortunately we do not have a "Babelfish". Traditionally, the function of translators is performed by people who professionally translate written or spoken texts, including real-time conversations (so-called simultaneous interpreters). We also have digital interpreters - tools in the form of computer programmes or dedicated devices. These are becoming increasingly refined and are slowly approaching the high standard of fictional "Babelfish" translation.

The aim of this presentation is to exhibit modern technical solutions for language translation, their usefulness and limitations. To conduct the analysis a document research method was used, based on industry articles available on the Internet.

## Translators – programmes

Thanks to the development of computers, the Internet and artificial intelligence, machine translation (MT) has become possible. These are complex applications, based on machine learning (ML) technology, which independently translates texts from the source language into the target language. For this purpose, they use not only huge databases containing hundreds of millions of words and phrases, but also modern technologies - deep learning, big data or cloud computing. Every year they become more and more effective and their work becomes increasingly more accurate [9].

The most popular solution for translation tools are online translators. Of these, Google Translate is the most widely used. It is estimated to have around 200 million users worldwide every day. Table 1 overviews a group of the best online machine translators (MTLs).

**Table 1**

**Overview of the top online translators by ITIGIC (as of April 2020)**

| No. | Name of the translator | Number of supported languages | Features |
|---|---|---|---|
| 1. | Google Translate | >100 | Translates: text, speech, images (including video) in real time; Converts text to speech. |
| 2. | Bing Translator | 53 | Translates: text, speech, websites; Converts text to speech. |
| 3. | Translate.com | >90 | Translates: text, by experts for an additional fee |
| 4. | Babylon Online Translator | 77 | Translates: text; Collection of synonyms and antonyms; Data base of >1.700 dictionaries. |
| 5. | DeepL Translator | 26 | Translates text; Recognizes linguistic nuances. |
| 6. | Translatedict | 51 | Translates: text, speech, by experts for an additional fee; Converts text to speech; Dictionary. |
| 7. | SpanishDict | 2 | Translates in languages: english/ spanish; Converts text to speech; Platform for learning grammar rules and pronunciation; Biggest dictionary of the english language in the world; Creates conjugations for each verb. |
| 8. | ImTranslator | >100 | Translates: text; Dictionary; Converts text to speech in 30 languages; Spell-checking module. |
| 9. | PROMT Online Translator | 20 | Translates: text; Collection of idioms. |
| 10. | Collins Dictionary Translator | >30 | Translates: text, speech; ; Converts text to speech; Dictionary; Collection of synonyms and antonyms. |

Source: own work, based on an article [4]

Most of the above-mentioned translators offer speech translation and text-to-speech conversion in addition to text translation. However, the quality of the product made by using these tools is not error-free. The developers introduce certain improvements, allowing the system to continuously develop and learn in a certain way. Usually, the database for translators is based on the dictionaries entered into the system. In some cases, however, this database is constantly updated. E.g. Google

Translator uses new entries entered into the Google search engine. Another example is PROMT Online Translator, which uses neural networks, statistical, analytical and hybrid technologies to improve the quality of service.

One of the most advanced machine translation systems in the world is Microsoft Translator [5]. It is based on statistical (statistically the most frequent word in the database) machine translation (SMT). However, currently it also uses a technology called Neural Machine Translation (NMT), which complements machine translation and significantly increases its accuracy. It translates not so much words as entire phrases and expressions, taking into account the context in which they occur. While developing this system, programmers "teach" the translator to recognise and take into account such issues as: the type of nouns, the level of formality of the utterance (from slang to formal style), and the type of word (noun, verb, etc.) [9].

In addition to the translators available on the internet, we have dedicated electronic devices for interpreting speech. Examples of these and the features available to them are shown in Table 2.

**Table 2**

**Interpreters – devices**

| No. | Name of the interpretator | Number of supported languages | Accuracy of the translation (%) / users evaluation | Features |
|---|---|---|---|---|
| 1 | Vasco Translator M3 | 76 | >96% 9.9 | Interprets: speech, phone calls, groups and meetings (MultiTalk); Translates: images; Language learning application. |
| 2 | Vasco Mini 2 | 58 | >96% 9.7 | Interprets: speech. |
| 3 | Jarvisen | 60 | >95% 9.3 | Interprets: speech. |
| 4 | Pocketalk S | 74 | No data available 8.7 | Interprets: speech; Translates: images. |
| 5 | Pocketalk W | 74 | No data available 8.2 | Interprets: speech. |
| 6 | Travis Touch Go | 70 | No data available 7.6 | Interprets: speech. |
| 7 | Dosmono Travel | 72 | >89% 6.8 | Interprets: speech, groups and meetings; Translates: images. |
| 8 | Longogo Genesis | 104 | >87% 6.5 | Interprets: speech; Ability to share the translations. |

Source: own work, based on an article [6]

Vasco Translator M3 and Vasco Mini 2 have the highest translation accuracy, rated at over 96%, and have received the highest evaluation scores (over 9.7) according to users. These are immensely useful devices, although, in contrast to free online solutions, they require users to make a financial investment in its purchase. The price of such devices starts at several hundred dollars [1].

**Summary**

Machine Translation (MT) initially (1950s) was based on rules (Rule-Based Machine Translation – RBMT). Today, there are much more advanced tools available – operating on neural networks and databases of billions of words and phrases. However, they have their shortcomings. This applies mainly to content that carries an emotional message (poems, fairy tales, songs), for which the rendering of human feelings and emotions is not available to machine translation. Moreover, machine translations, despite advanced IT solutions, are still imperfect and require human verification, if only in the form of so-called post-editing (translation after the machine). [9] These translations are not free from grammatical and stylistic errors. In order to prevent some of the problems, a spell-check module was introduced (as for example in the ImTranslator online translator) or even programs that are created to check grammatical correctness. An example is ReversoSpeller, which verifies (online) the grammar and spelling of the input text (in 15 languages) [7].

Despite their limitations, various devices not only improve the work of translators, but also help the average user to access information and understand foreign language content. They integrate the user into the global society, reducing the scope of social exclusion due to limited knowledge of foreign languages. It seems that they can be treated as modern, important social innovations that use artificial intelligence [8] to improve the quality of human life.

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