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PRIORITY COMBINING OF MACHINE TRANSLATION METHODS

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Abstract: *In this study is done an analysis of the specific factors that determine the quality of the various methods of machine translation, opportunities for their optimal combined use and additional methods to optimize the "training" and the work of translational programs.*

1. Introduction

Machinery translation is a computer tool of computer linguistics, what is busy with automatically translation of written text or speech from one natural language to the other language using software.

It is accepted the beginning of machinery translation is in 1954 by experts of IBM. They were optimists saying that the whole process will take 2-6 years for good level of translation. There are passed more than 7 decades and the experts of linguistics mean the good goals are in further.

In the presented article is done analysis of the specific factors for the quality of the different machinery translation tools, for the possibilities of their application and for the additional methods for optimization of working translation programs.

1. Models of Machinery Translation

The known machinery translation methods are basically:
- automatically translation by human supporting programs with the human translators,
- automatically translation by machinery programs with the human additional translators' help.

The humans' translation could executed:
- as whole text translation;
- simultaneous translation of several sentences;
- analogically without précising translation of the text.

The basic translation goals are linked with:
- sentences building of the corresponding languages,
- neglecting,
- absence of translational analogies,
- multiversity/ polysemantic expressions.

2.1. Methods of Machinery Translation

<u>Machinery Translation with the Dictionaries</u> is the simplest one. The process here is built on the replacing of a word of one language by a word of another language. This kind of machinery translation is of limited application.

<u>Machinery Translation based on rules</u> includes grammatical regulations for analysis and synthesis of sentences and word building/ words formations. To realize this last method are necessary different kinds of dictionaries, regulations for particular morphological, semantical and syntactical information for both the languages. These resources are defined by qualified experts/ translators. This is complicated and hard working process.

<u>Machinery Translation based on metalanguage (helping intermediate language)</u> is a translational particular case, based on rules for unification of the language for specific terminology.

2.2. Elements of Machinery Translation

The basic computer elements of machinery translation are:

Language element P(e). It shows how possible in every day speech is the translated sentence in English. This tool gives the information of how high likely orthographically would be translated sentences.

Translational method P(b|e) assures high corresponding meaning for the couple (b,e), when **b** is translation of **e**.

Decoder D(b|e) is *algorithm for chasing*, what is trying to find the most corresponding to **b** translation **e**. This is the same time computer tool for maximizing of logical product P(e).P(b|e).

In case of application of *based on analogical examples machinery translation bilingual building* the translational process finds the more closed expression from the examples database in the computer memory for put for translation unknown sentences from the other language. This approach is very close to machinery self teaching.

Qualified machinery translation of very high correspondence could be effected/ achieved by applying of artificial intellect (AI) in the process.

The experts databases keep and refine knowledge for teaching and self teaching of the computer. If combine according to fuzzy logic (expert systems) and with fuzzy logic elements the machinery translation could be executed closely perfect to the high quality human translation where are taken an account terminology constructions and forms.

2.3. Methods for Optimal Translation

During the teaching the translator has to work as supporting translation tool. Thus there are developed the dictionaries, reach databases with the regulations and helping teaching databases, what could be modified and used by an high qualified expert for higher lever education ready examples, kept in the computer, and for optimizing of the program tools.

To avoid the low speed translation it is possible to replace the education regimes with the high speed regimes.

The priorities what are advances in some cases could be not good for the other cases, depending on the possible combinations and on the translation demands. In such cases it is necessary to choose the variant with the best properties for the corresponding case of translation.

First step is possible to be the definition of more large rules of combining methods for translation. Next step could be building of specified priorities according to the demands of the languages (terminologies) and the text idiosyncrasies.

In some particular cases it is possible to pass corrections and betterments in the text using previous modules of the algorithm.

The idioms in the text could be fixed before free machinery dictionary changes.

The morphology helps to find faults and words, what are not in the database for the chosen language.

In particular cases the meaning of a word could be defined only in the context of the sentence. This is the prior and significant step using the methods of regulated translation.

Particularly in English the sentence structure is clear and fixed which is facility in machinery translation. This structure allows easy syntaxes control.

It is possible to classify in groups words, homonyms, of common writing and different meaning. The homonyms semantic is different. The unique translation possibilities is the applications, terminology using in the sentence. For the humans the sentences have unique meaning and the human brain easy finds correspondence. The homonyms, writes similar in one or in several speech forms are called homoforms (morphology homonyms). Омонимите могат да бъдат както еднакви части на речта и форми така и различни.

The examples for every day use homonyms in English are: bank (4 meanings), bear, book, bow (7 meanings), can, dove, lie, steel, tip and others. The same way it is not possible to define the meaning of homographs (graphical homonyms) out of context. They are written the same way and only the context and the accent give them the right meaning.

Polysemy e possibility a word or an expression to have more than one meaning. In case of polysemies a word or an expression has linked meanings comparing with the difference between the homonyms and homographs. The basic, most frequent in use, meaning of the polysemies plays the link with every other meaning and the basic

one. The main polysemies property is their etymology base. According to scientific findings 40% of English words are polysemies. The most polymeaning polysemies have more than 30 meanings. It is accepted that in Bulgarian the polysemies are about 20% of all.

It is very important to divide the regulated words from the base dictionary from the other words, which are additionally adjoined ones. Thus the priorities have to be chosen for the separated group, not widely in general. Thus the chosen priorities are not available for total dictionary but for separated part only.

It is possible to keep in external database chosen texts or chosen part of texts what would be available for often use. They could be counted in the computer for prior ready texts in the terminology database for particular translations depending on terminology and/or special often applied idioms. In such cases the translation will be facilitated. This way could be built special databases for translation from one language to the other in particular works/ cases.

With the practice in translations it is possible to moderate and make more reach defined databases and on the same building to form new databases for different applications. This way the faults, found previously, will be avoided. If necessary the particular expressions or terminology could be renewed and modified with more recent or better fixed.

In terms of computer using and applications it is possible to illustrate written above by the scheme, shown in **fig.1**.
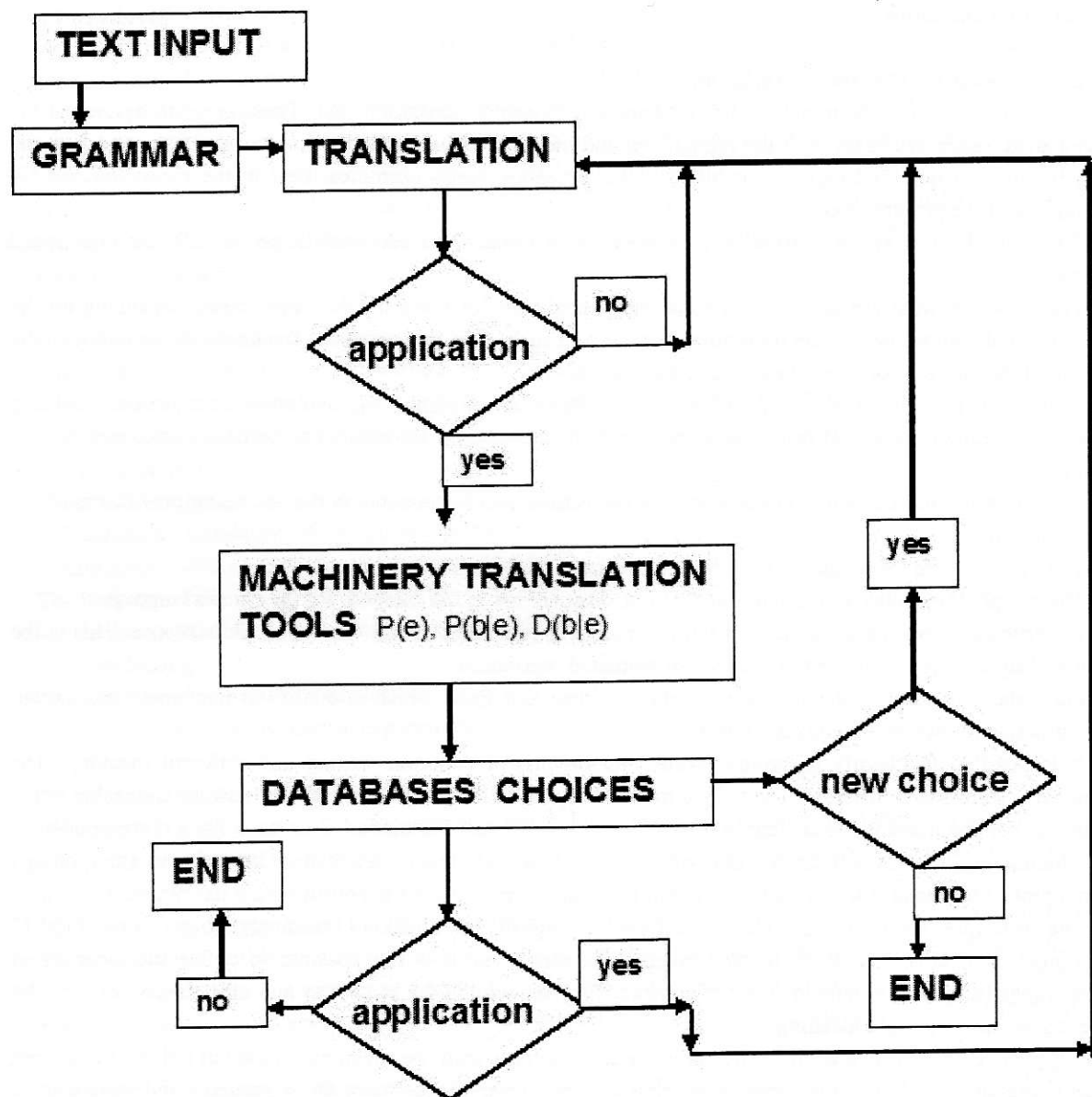

Fig. 1

3. Conclusions

The answer of the question: „*Does universal translation method exist?*" is: NO.

BUT IT IS POSSIBLE TO DEFINE PRIORITIES, which could be:

- Analysis of natural speech in chosen language and its grammar;
- Subject area;
- Preparation of the text;
- Division of the chosen language in specific databases;
- Choose model of translation (with basic continuous external help/ with occasional external help);
- Choose method of translation (<u>Machinery Translation with the Dictionaries based on rules</u> or <u>Machinery Translation based on metalanguage</u>);
- Computer based elements definition;
- Optimization and modification of the databases.

The development of the product for translation can be significantly accelerated by building hierarchic organization of the layers of permitted access for customers. The main layers

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