USING OF GENERATIVE GRAMMAR FOR MODELING OF SENTENCE SYNTAX

V. Vysotska[1], T. Shestakevych[1], Y. Scherbyna[2]

[1]National Lviv Polytechnic University, Department of Information Systems and Networks,

[2]Ivan Franko National University of Lviv, Department of Discrete Analysis and Intelligent Systems

The rapid development of the Internet has intensified the creation of various linguistic resources. The need for process automation analysis/synthesis of natural language texts led to the emergence of appropriate linguistic models and methods of processing. An essential was the development of many linguistic disciplines for the purpose of information sciences. Integration processes in most areas of life of the modern world draw attention to the development and creation of the automated processing of multilingual information.

Traditionally, the analysis of natural language texts consists of three sequential processes (morphological, syntactic and semantic), for which were established models and methods. Thus, the theory of generative grammars, which beginning was laid by American linguist N. Khomsky, is an effective tool for linguistic modeling on syntactic level of language. Scientist used formal analysis of the grammatical structure of sentences, which allows you to identify the syntactic structure, which is the main circuit of phrase, regardless of its value. N. Chomsky ideas was developed by the Soviet linguist A. Hladkyy, who has applied the concept of dependency tree components and systems for modeling syntax of the language. He proposed a method of modeling syntax using syntactic groups that produce components phrases as units Building dependency tree - this representation made it possible to combine the advantages of the method immediate constituents and dependency tree.

Developments of N. Chomsky and A. Hladkyy, research of M. Gross i A. Lanthen, A. Anisimov, Y. Apresyan, N. Bilhayeva, I. Volkova and T. Rudenko, E. Bolshakova, E. Klyshynskyy, D. Lande, A. Noskov, A. Peskov and E. Yahunova, A. Gerasimov, B. Martynenko, A. Pentus and M. Pentus, E. Popov, V. Fomichev applicable to the development of natural language processing tools as information retrieval, machine translation, annotation texts, morphological, syntactic and semantic analysis, training and didactic, linguistic providing of specialized software systems and more.

In the article will show method of using the device of generated grammars to modeling syntax of sentences in different languages - English, German and Ukrainian. For this goal we will analyze the syntactic structure of sentences and demonstrate the features of the synthesis of sentences indicated languages. Consider the impact of regulations and rules of the language on the course of constructing grammars.

Research application of mathematical methods for the analysis and synthesis of natural language texts originate from the middle of the last century, when the development of mathematical algorithms and software processing of natural language texts focused considerable efforts of scientists. The device of generated grammars proposed by N. Chomsky, modeling processes in syntax level of language - highlighted structural elements of the sentence give an option to describe syntactic constructions regardless of their content. In the article the features of the process of sentences synthesis of different languages with using of generative grammars had been shown, the influence of norms and rules of the language on the course of constructing grammars had been considered. Using of generative grammars has great potential in development and creation of automated systems for multilingual information processing for linguistic software of computer systems and etc.

In nature languages there are situations where phenomena, that depend on the context, described as independent on context in terms of context-free grammars. Then description is complicated with taking into account new categories and rules. In this article reviewed the introduction of new restrictions on the classes of data grammars. When the number of characters in the right part of the rule is not less than the left one, uncut grammar had been received. With replacing only one character was got a context-sensitive grammar. With the presence in the left side the rules only one character was got a context-free grammar. Any following natural restrictions on left sides of rules no longer available to be imposed.

In the article had been presented using of generative grammars in linguistic modeling. Description of modeling sentence syntax used for automation of the processes of analysis and synthesis of natural language texts.

Keywords - generative grammar, sentence structure scheme, computer linguistic system.