PECULIARITIES OF SENTENCE SEMANTICS GENERATION IN NATURAL LANGUAGE VIA GENERATIVE UNRESTRAINED AND CONTEXT-SENSITIVE GRAMMARS

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The research of the application of mathematical methods to the texts analysis and synthesis in natural language is of paramount importance in the mathematical algorithms and software development of natural language texts processing. The generative grammars device (introduced by Noam Chomsky) simulates processes at the syntactic level of natural language. The structural elements of the sentence describe syntactic constructions, regardless of their content. The article provides a profound insight into the peculiarities of the sentences synthesis process in different languages that makes use of generative grammars. The paper considers the influence of language norms and rules on grammars construction stages. The generative grammars assistance has great potential in the development and creation of automated systems for multilingual information processing and linguistic software for linguistic computer systems, etc. There are cases in natural languages where the phenomena (that depend on context) are described as independent of the context, i.e., in terms of context-free grammars. These are the cases in which the description is complicated due to the new categories and rules creation. This paper introduces the process peculiarities of the new restrictions on the introduction of the grammars classes through the new rules introduction. Provided the symbols number in the right side of the rules is not less than in the left one, unabbreviated grammars have been attained. Then context-sensitive grammars have been produced on replacing only one symbol. Having the one symbol only rule in the left side, has resulted in context-free grammars. No other natural constraints on the left side of the rules could be further imposed.

The application of the generative grammars theory to problems solving in applied and computational linguistics at the level of morphology and syntax allows:

- to develop systems of language and texts synthesis;
- to create textbooks with practical morphology;
- to form derivational tables;
- to compile the morphemes lists (the affixes, the words basis and roots);
- to determine the performance and frequency of morphemes;
- to calculate the realization frequency of different grammatical categories in texts (genus, case, number categories, etc.) for specific languages.

The developed models on the basis of generative grammar are used for functioning maintenance of the analytical-synthetic processing of documents in computer linguistic systems, information search systems and other. It is useful to introduce newer and newer restrictions on these grammars, yielding narrower and narrower classes of them. Describing the complex range of phenomena, the set of description tools used is restricted, and tools that are obviously insufficient in the general case are considered. The research is started with minimal resources and tools and whenever they appear insufficient, new tools (possibly a restricted number) are gradually introduced. This leads to the possibility to determine exactly what tools can / can not be sufficient in a particular phenomenon description, and thus – to better understanding of its nature. Prior to the advent of mathematical language models, this approach was not applied in linguistics. Its consistent implementation is due to grammar theory and mathematical linguistics in general.

The known methods and approaches for the problem solving of automatic processing of natural language information are considered in the article. Also, advantages and disadvantages of existing approaches and results in the syntactic aspects of computational linguistics are identified in the paper. The general conceptual principles of derivational modelling processes in the texts corpus formation of Ukrainian and German sentences examples are introduced in this work. Besides, the author has proposed the syntactic models and derivational classification of lexical structure for Ukrainian and German sentences, lexicographical rules of syntax type for automated processing of these sentences are formulated. The proposed methodology achieves higher reliability standards compared with known analogues. And they also demonstrate the high efficiency of the new information technology applied applications design in lexicography and the inflectional effects research of natural language. The work has practical value, since the

proposed model and rules allow effectively organize the process of the development of lexicographical systems of syntactic type.