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The Problem Of Linguistic Resources In Modern Computational Lexicography

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Abstract: This article analyzes pressing issues related to the creation, structural modeling, and integration of linguistic resources within the framework of modern computational lexicography. The study examines the main types of linguistic resources - such as electronic dictionaries, corpora, thesauri, and semantic networks - their functional capacities, and fields of practical application. Problems of formalization, standardization, interoperability, and continuous updating of linguistic data are identified as key challenges. In addition, the article discusses ways to enhance the quality, reliability, and adaptability of resources designed for Natural Language Processing (NLP) systems. The research findings are of significant theoretical and practical value for the development of electronic lexicography, language technologies, and the digital humanities.

Keywords: Computational lexicography, linguistic resources, electronic dictionary, language corpus, semantic network, thesaurus, natural language processing (NLP), data modeling, digital lexicography.

Introduction: Computational lexicography constitutes a significant branch of computational linguistics. All research conducted within this field is intrinsically connected with lexicography. The national lexical wealth and expressive potential of a natural language are systematically reflected in dictionaries. In the United States, Europe, and East Asian countries such as Japan, China, and Korea, considerable attention has been devoted to computational lexicography. Consequently, modern dictionaries are characterized by machine-readable formats, advanced search capabilities, indexing, categorization, clustering, and a high degree of accessibility and usability for end users.

METHOD

The application of computer technologies to the field of lexicography has significantly facilitated dictionary compilation processes. The emergence of computer technologies and the use of modern, new-generation computers in linguistics—particularly in lexicography—have brought about a fundamental transformation in this domain. Specifically, tasks such as grouping, systematizing, and alphabetically ordering lexical units can now be carried out on computers within a very short time and with a high degree of accuracy. At present, the use of computer technologies for processing, updating, and publishing dictionaries, together with modern printing technologies, has created favorable conditions for producing dictionaries in several million copies within a short period of time and ensuring their efficient dissemination.

As a result of the optimization of dictionary-related work through computer technologies, the field of computer lexicography has emerged. Computer lexicography constitutes an important component of applied linguistics and focuses on the study of computer dictionaries created on the basis of linguistic and software resources, operating according to the principles of encoding and decoding, as well as the programs and algorithms used for their compilation. With the development of this field, numerous electronic dictionaries have been created under various names. Among the most widely known electronic dictionaries are CONTEXT, ABBYY Lingvo,

MULTITRAN, POLYGLOSSUM, and MULTILEKS [1]. The placement of compiled dictionaries on the Internet represents an aspect of lexicography closely associated with electronic software tools. This implies that modern, new-generation computers provide substantial assistance to lexicographic practice in two key respects: accelerating (automating) the process of dictionary compilation and enabling the dissemination of dictionaries via global networks. At this point, it is essential to clarify one important issue. Not every dictionary uploaded to an electronic network can be regarded as an electronic dictionary in the strict sense. Although placing a printed, book-format dictionary on the Internet may appear to be a significant step, such an approach merely allows the user to read the book on a screen. Since such resources are not initially processed or structured according to specific requirements, they cannot be effectively accessed or utilized for diverse functional purposes.

In linguistics, particularly in Uzbek linguistics, a clear distinction is drawn between traditional dictionaries (paper-based editions) and dictionaries that are merely uploaded to the Internet without any prior processing (i.e., unstructured online versions). In this context, it is important to examine both the similarities and differences between electronic dictionaries and other dictionary formats. The future development of lexicographic work is especially significant for users of the Uzbek language as well as for learners of Uzbek as a foreign language. To this end, it is necessary to become familiar with the structural organization of dictionaries in both paper and electronic formats, to identify their specific characteristics, and to conduct a comparative analysis between them. At the same time, it is essential to investigate which types of modern dictionaries are in greater or lesser demand and to organize lexicographic activities accordingly. A new stage in the development of lexicography is also characterized by the emergence and formation of new perspectives on the dictionary itself and on its internal structure.

At present, linguists interpret the extensive use of computers in lexicography in different ways. Some scholars emphasize that the computer merely serves as a technical tool and is not of fundamental importance for lexicography as a discipline. Others, however, tend to overemphasize the role of computers in dictionary compilation and support the view that their introduction constitutes a true revolution in the field. In our view, the issue requires an objective approach and a scientifically grounded assessment of this new stage in the development of lexicography.

Applied linguistics is the field that investigates the use of linguistic knowledge in everyday practice, and the teaching of the mother tongue and foreign languages in general and specialized schools constitutes one of the most important areas of linguists' practical activity. For this purpose, various textbooks, dictionaries, and grammars are developed. Translation from one language into another, the creation of terminology, the improvement of writing systems and orthography, as well as the development of scripts for peoples who historically lacked a written tradition, also form part of applied linguistic practice. In recent years, engineering linguistics has emerged as a distinct branch of applied linguistics. The use of technical tools in language teaching, issues of television and radio communication, and machine translation are among the key domains of engineering linguistics [2, p. 15].

The concept of "electronic dictionary" is a term that has appeared in linguistics over the past thirty years. The term "computer lexicography" appeared relatively earlier. The scientific interpretation of this concept is set out in the textbooks and study guides "Computational lexicography" by Y.N. Marchuk, published in 1976, "Machine lexicography" by E.V. Vertel, published in 1984, "Automated lexicography" by O.A. Kazakevich, published in 1985, and "Computer lexicography" by V.V. Markovkin, created in 1990. In particular, Y.N. Marchuk emphasizes the need to generalize these terms under the heading "Computer linguistics", and to discuss the solution of current problems of linguistics using computers based on modern programming trends [3]. K.M. Mandrikova emphasizes that the terms "computational lexicography", "computing machine" and "automatic lexicography" are one concept and that in their essence there is a single tool - a computer. She emphasizes that "computer lexicography" is a separate direction of linguistics. She concludes that lexicography should be considered as a separate field. The content of this science assumes the publication of all results related to this problem, recognizing the existence of theoretical and practical issues of various types of computer

dictionaries [4].

In our opinion, the terms “computational lexicography”, “machine lexicography”, “electronic lexicography”, “automatic (automated) lexicography”, which denote the same phenomenon, can be avoided by replacing them with a specific term - computer lexicography, and it is appropriate to study it in this context as a branch of computer linguistics. This term also includes the previously actively used terms computational lexicography, machine lexicography, automated lexicography and statistical lexicography. Linguist and computer scientist A. Pedron explained the difference between traditional dictionaries and new generation dictionaries on the basis of a VENN diagram in his work entitled “Electronic Lexicography” [5]. The author clarifies the above questions by referring to H. Bergenholz’s views on electronic lexicography. He believes that users of electronic dictionaries created through computer lexicography will achieve their goals more easily and quickly, and that experts from both fields, namely linguistics and information technology, will participate equally in the creation of such electronic dictionaries [6].

In our opinion, computer dictionaries differ from ordinary traditional dictionaries in the following advantages:

- simple and fast procedure for entering the dictionary and obtaining information from it based on certain queries;
- the ability to refer to several dictionaries at the same time, clarify the meaning of a word in a short time and draw general conclusions (in traditional dictionaries this is a very time-consuming and labor-intensive process);
- the ability to highlight a word in any language and compare it with other dictionaries. For example, an 8-language translation dictionary can be based on any language, that is, all languages represented in multilingual dictionaries have the same rights and search capabilities;
- after the publication of ordinary dictionaries, the number of words and their definitions cannot be changed until re-publication. Computer dictionaries are open mobile systems. In such dictionaries, it is possible to add new words to the database, make corrections, and remove obsolete words (or place these words in separate groups).

Many computer dictionaries are available on the World Wide Web (WWW for short). This is one of the most popular electronic resources on the Internet. Like most documents on the Internet, dictionaries are created in HTML (Hyper Text Markup Language). The above software simplifies working with dictionaries and increases their efficiency [7]. In dictionaries placed in this format, the title of each dictionary entry also serves as a reference, and if a word is repeated elsewhere, the user can immediately be informed about it. Thus, in dictionaries created in hypertext format, the titles of all dictionary entries are directly linked to each other. In newly developed hypertext dictionaries, it is possible to hypertextually refer to synonyms, antonyms, homonyms and browse several dictionaries at the same time.

CONCLUSION

In electronic dictionaries, search is not limited, words are arranged alphabetically and fully meet the user's needs. The emergence of electronic dictionaries has led to a change in the form and content of traditional dictionaries. Large-scale dictionaries have already been transferred to electronic media (CD, flash drive). Unlike traditional dictionaries, the main work in electronic dictionaries is based not only on the alphabetical order of words, but also on the fact that in electronic dictionaries words and phrases are listed in a differentiated manner, explained with examples, extensive dictionary entries, and the latest multimedia elements are presented in accordance with the requirements of the time. The representation of words in electronic dictionaries can be colorful, figurative, graphic, sound and video images. Explanations of words in electronic dictionaries must be given in accordance with language standards. The dictionary uses context and colloquial meanings, homonyms, synonyms and antonyms, phraseological units, and idioms to reveal the meaning of a word. The dictionary has a wide range of capabilities, including the ability to translate texts into different languages.

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