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ALISHER NAVOIY NOMIDAGI TOSHKENT DAVLAT O‘ZBEK TILI VA ADABIYOTI UNIVERSITETI

“ZAHIRIDDIN MUHAMMAD BOBUR MEROSINING SHARQ DAVLATCHILIGI VA MADANIYATI RIVOJIDA TUTGAN O‘RNI”

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ZAMONAVIY TILSHUNOSLIK VA RAQAMLI LEKSIKOGRAFIYADA KONCHILIK TERMINOLOGIYASINI TEZAURUS ASOSIDA TALQIN ETISH

INTERPRETATION OF MINING TERMINOLOGY BASED ON A THESAURUS IN MODERN LINGUISTICS AND DIGITAL LEXICOGRAPHY

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Annotation. *This article explores the interpretation of Uzbek mining terminology from the perspective of modern linguistics and digital lexicography using a thesaurus-based approach. The study is based on materials from a modern monolingual dictionary of mining terms(Contemporary dictionary of Uzbek mining terms) currently being developed in the Uzbek language. In this dictionary or thesaurus, particular attention is given to issues of semantic ambiguity, polysemy, structural inconsistency of terms, and the need for a systematic identification of lexical-semantic relations within the terminological system. The findings of this study of Uzbek mining terms demonstrate that the thesaurus model provides an effective framework for the normative, consistent, and systematic description of mining terminology, contributing to improved terminological standardization and information retrieval in digital environments.*

Keywords: *mining terminology, thesaurus, terminological system, digital lexicography, lexical-semantic relations.*

Annotatsiya. *Mazkur maqolada o‘zbek konchilik terminologiyasini tezaurusga asoslangan yondashuv orqali zamonaviy tilshunoslik va raqamli leksikografiya nuqtayi nazaridan talqin etish masalalari yoritiladi. Tadqiqot o‘zbek tilida yaratilayotgan konchilik terminlarining zamonaviy bir tilli lug‘ati (O‘zbek konchilik terminlarining zamonaviy lug‘ati) materiallari asosida olib borilgan. Unda, asosan, terminlarning semantik noaniqligi, ko‘p ma’noliligi, strukturaviy izchillik yetishmasligi hamda terminotizim doirasida leksik-semantik munosabatlarni tizimli ravishda belgilash zarurati asoslab beriladi. Tadqiqot natijalari konchilik terminologiyasini normativ, izchil va tizimli tavsiflashda tezaurus modelining*

samarali vosita ekanini ko‘rsatadi hamda raqamli muhitda terminologik resurslarni takomillashtirishga xizmat qiladi.

Kalit so‘zlar: *konchilik terminologiyasi, tezaurus, terminotizim, raqamli leksikografiya, leksik-semantik munosabatlar.*

Introduction. Contemporary linguistic research increasingly treats terminology not as a simple set of isolated names, but as the structural backbone of scientific knowledge. From this perspective, terminology performs both cognitive and communicative functions, shaping how specialized domains are conceptualized and how knowledge is exchanged within them. In industrial and technical fields, where accuracy is essential, the coherence and semantic stability of terminological systems play a decisive role in ensuring reliable communication. Ambiguity, inconsistency, or overlap in term usage can undermine scientific discourse and technical documentation, potentially resulting in flawed decisions and incorrect technological implementation. For this reason, a comprehensive description of any terminological system must go beyond individual definitions and account for the network of relationships between concepts, including hierarchical, associative, and equivalence links. Traditional explanatory dictionaries are often not suited to this task, as they typically present terms in isolation and do not reflect their systematic interdependence [Aitchison, 2000:67]. Furthermore, they always lack semantic relations within terminology. In response to these limitations, the thesaurus has become an effective tool for terminological modeling. By explicitly structuring semantic relationships among terms, a thesaurus facilitates the standardization of domain knowledge while improving both human understanding and automated information retrieval. As a result, thesaurus-based approaches continue to hold significant relevance in modern lexicography, particularly in rapidly evolving and highly specialized scientific fields. Namely, in mining sphere which is developing day by day the need to create a mere, standardized and complex dictionary or thesaurus can not be left without attention.

Thesaurus and Terminological System Theory. The emergence of the thesaurus is closely linked to the practical needs of information retrieval systems, where the lack of controlled vocabularies and the inconsistent use of specialized terms significantly reduced the effectiveness of indexing and search. In technical and scientific domains, namely mining, the same concept is often expressed by multiple lexical forms, which complicates both information access and professional communication. Under these conditions, traditional lexicographic resources proved insufficient for systematic knowledge organization.

Unlike general-purpose dictionaries, which primarily describe the meanings of individual words, a thesaurus is intended to regulate terminological usage within a specific field. Its focus lies not on lexical explanation as such, but on the explicit representation of conceptual relations and the reduction of unjustified terminological variation. As a result, the thesaurus performs a normalizing function, establishing a coherent structure for domain-specific terminology.

As noted by Aitchison and Dextre Clarke, an information retrieval thesaurus differs fundamentally from a literary thesaurus in its prescriptive nature. Rather than documenting all possible lexical variants, it directs users toward a limited set of preferred terms and systematically restricts the use of non-preferred forms. This approach ensures terminological consistency and improves the reliability of both professional discourse and information retrieval processes [Aitchison & Dextre Clarke, 2004: 5–21]. In practice, a technical thesaurus designates a standardized descriptor for each concept, while alternative expressions, such as abbreviations, borrowings, or informal variants are explicitly linked to it through reference mechanisms.

The basic theoretical principles of thesaurus construction were developed through early applied projects, including sector-oriented resources such as the Chemical Engineering Thesaurus and the Thesaurus of ASTIA Descriptors. These projects demonstrated that organizing terminology according to conceptual relationships is more effective than relying on alphabetical ordering alone (American Institute of Chemical Engineers, 1961; Armed Services Technical Information Agency, 1960). Within such systems, terms are connected through hierarchical relations (broader and narrower concepts), associative links, and equivalence relations, forming an integrated terminological network.

This methodological approach is particularly relevant for Uzbek technical terminology, including mining and industrial fields, where parallel term forms and semantic overlap are common. In non-specialist usage, for instance, the Uzbek terms *kon(mine)*, *shaxta(shaft)*, and *yer osti koni (underground mine)* are often treated as interchangeable, despite their different conceptual scopes within mining practice. A thesaurus-based model makes it possible to define *kon (mine)* as a broader concept, while *shaxta (shaft)* and *yer osti koni (underground mine)* are assigned narrower or related positions, with their semantic boundaries clearly specified.

A similar solution can be applied to terminological variation resulting from lexical borrowing. Uzbek mining terminology frequently includes parallel native and borrowed forms, such as *foydali qazilma* (useful mineral) and *mineral resurs (mineral resource)*, or *qazib olish (mining)* and *ekstraksiya (extraction)*. Within a thesaurus

framework, one form may be selected as the preferred term, while the others are treated as equivalent but non-preferred variants. This systematic organization enhances terminological stability and supports standardization in scientific writing, educational contexts, and digital information systems.

Thus, the thesaurus should be understood not merely as a reference tool, but as a conceptual model of a terminological system. By explicitly structuring semantic relations and guiding term usage, it provides a solid theoretical and practical foundation for the development, normalization, and digital implementation of Uzbek specialized terminology.

Lexical-Semantic Foundations of the Thesaurus At the core of the thesaurus model lies a structured system of lexical-semantic relations that connect terms within a specific domain and transform a simple list of lexical units into an integrated conceptual framework. These relations allow terms to be defined not in isolation, but through their position within a network of interconnected concepts, reflecting the internal organization of specialized knowledge. Aitchison, Gilchrist, and Bawden identify three fundamental types of relationships that form the basis of thesaurus construction: equivalence, hierarchical, and associative relations [Aitchison, J., 2000: 30]. Equivalence relations are used to manage synonymy, variant spellings, abbreviations, and terminological borrowings by designating a single preferred term and linking alternative forms to it. In the context of Uzbek technical terminology, for example, the terms foydali qazilma(useful mineral) and mineral resurs (mineral resource) may be treated as equivalent, with one selected as the standardized descriptor and the other marked as a non-preferred variant. Hierarchical relations establish broader–narrower conceptual structures and reflect class–subclass or whole–part relationships. These relations make it possible to organize terminology into logical taxonomies and to model scientific knowledge in a structured and transparent manner. As Dextre Clarke emphasizes, hierarchical relations are central to the creation of a coherent structural representation of knowledge, since they reveal the conceptual levels and dependencies within a domain [Dextre Clarke, 2001:72-110]. In Uzbek mining terminology, for instance, the term kon (mine) functions as a broader concept, while ko‘mir koni (coal mine), oltin koni (gold mine), and yer osti koni (underground mine) represent narrower concepts within the same hierarchy. Associative relations, unlike hierarchical ones, capture non-taxonomic connections between terms based on functional, processual, or thematic proximity. These relations highlight how concepts interact within real-world processes rather than how they are classified. For example, in mining discourse, the terms qazib olish (mining), boyitish (benefication), and transportirovka (haulage or conveying) are not hierarchically

related, yet they are closely connected through the production cycle and can be effectively linked through associative relations in a thesaurus. By systematically applying these three types of lexical-semantic relations, a thesaurus enables the clear delimitation of term meanings, reduces semantic ambiguity, and supports the interpretation of a terminological system as a dynamic “network of concepts.” This relational structure is particularly valuable for digital lexicography and information retrieval systems, where precise semantic modeling directly influences search accuracy and knowledge accessibility.

Semantic Issues in Mining Terminology

A number of recent studies have pointed out persistent semantic difficulties in Uzbek mining terminology, most notably polysemy, blurred semantic boundaries, and inconsistent patterns of term usage [Sobirova et al., 2025: 588–593]. These problems are not accidental. They stem from the historically layered formation of the terminological system, the long-term coexistence of native and borrowed lexical items, and the gradual specialization of common-language words within technical discourse. As a consequence, identical terms may be used with different meanings depending on the disciplinary framework, the author’s interpretation, or established institutional practice.

This type of semantic instability often results in divergent readings of key concepts in research articles, technical reports, and regulatory documentation. In Uzbek mining texts, for example, the terms *qazib olish (mining)*, *ishlab chiqarish(production)*, and *o‘zlashtirish (mine or deposit development)* are sometimes employed as near-synonyms, even though they refer to different processes or phases of mining activity. A comparable situation can be observed with the term *kon (mine)*, which may designate a geological deposit, an operating enterprise, or a specific extraction site, depending on context. The absence of clearly fixed semantic distinctions creates uncertainty in professional communication and complicates attempts at terminological unification.

From the standpoint of information science, such semantic vagueness has tangible consequences for information retrieval and knowledge structuring. As argued by Hjorland, terminological systems in which semantic relations are insufficiently specified tend to perform poorly in retrieval tasks, since search mechanisms cannot reliably align user queries with relevant documents [Hjorland, 2016: 144–159]. When conceptual relations remain implicit, relevant materials may be overlooked, while loosely related texts are retrieved instead.

These observations indicate the need for a systematic reconsideration of mining terminology based on relational models of description. Approaches grounded in

thesaurus construction offer practical means for addressing semantic inconsistency by explicitly defining equivalence, hierarchical, and associative relations between terms. Through such structuring, it becomes possible to delimit meanings more precisely, reduce ambiguity, and promote consistent term usage across scientific publications, educational resources, and digital information systems.

Digital Lexicography and the Thesaurus. In a digital environment, the development of terminological resources is increasingly shaped by their interaction with other systems of knowledge organization, including taxonomies, classification frameworks, ontologies, and metadata models. Unlike printed dictionaries, which are primarily oriented toward human readers, digital lexicographic resources are created with both human and machine use in mind. They are expected to support automated indexing, semantic search, and interoperability across platforms, which places additional demands on the internal organization of terminology.

Within this setting, the thesaurus occupies a key position. It provides a structured representation of domain-specific concepts and serves as a mechanism for maintaining terminological consistency in digital contexts. Research on corporate and enterprise search systems, in particular, shows that information retrieval performance improves when thesauri are used in combination with taxonomies and metadata structures. White’s analysis demonstrates that aligning controlled vocabularies with hierarchical classifications and document metadata allows search systems to move beyond simple keyword matching and to respond more accurately to user intent [White, 2016: 184–192]. This is especially relevant in specialized domains, where synonymous expressions, borrowed terms, and overlapping meanings are common.

At the same time, the place of thesauri in contemporary information retrieval has been the subject of sustained debate. With the widespread adoption of full-text search and machine learning techniques, some authors have questioned whether controlled vocabularies retain practical value. Addressing these concerns, Dextre Clarke revisits the long-standing discussion on thesauri and argues that their function has not diminished but rather changed. In digital environments, thesauri increasingly operate as semantic infrastructures that support query expansion, semantic linking, and interoperability between heterogeneous data sources [Dextre Clarke, 2016: 138–144].

Further insight into this issue is provided by Fast, Leise, and Steckel, who compare different types of controlled vocabularies, including authority files, taxonomies, and thesauri. Their analysis highlights a specific advantage of thesauri: the explicit modeling of semantic relationships between concepts. This feature makes it possible

to organize and retrieve information at the conceptual level, rather than treating terms as isolated lexical units [Fast, Leise & Steckel, 2002: 87].

For digital lexicography in specialized languages, including Uzbek mining terminology, these observations are of particular importance. A thesaurus-based approach not only improves search and retrieval performance, but also creates a foundation for terminological standardization, multilingual alignment, and the long-term maintenance of digital lexical resources. In this sense, the thesaurus functions not merely as an auxiliary tool, but as a structural core of digital terminological systems.

Integration of Modern Dictionaries and Thesauri

Within the scope of the present study, the dictionary of mining terms under development is based on thesaurus-oriented principles of terminological organization. Its conceptual design differs from that of traditional explanatory dictionaries, which are generally limited to the presentation of individual term definitions. Instead, the proposed dictionary is conceived as a structured terminological resource that reflects the internal organization of knowledge within the mining domain.

Alongside definitional information, the dictionary incorporates a range of linguistic and conceptual parameters, including part-of-speech classification, etymological commentary, and systematically described lexical-semantic relations. These relations include synonymy and antonymy, hierarchical links expressed through hypernymic and hyponymic structures, as well as holonymic and meronymic relations that capture whole–part conceptual dependencies. The inclusion of such relational data allows users to access terminology not only through sequential lookup, but also through conceptual navigation across the terminological system.

The integration of thesaurus principles into dictionary architecture transforms the resource from a conventional reference work into a model of the mining terminological system itself. By making semantic relations explicit, the dictionary contributes to greater clarity of meaning, limits interpretative variability, and promotes consistent term usage in scientific discourse, technical documentation, and educational contexts. At the same time, this structure significantly increases the resource’s adaptability to digital environments, where formally defined semantic relations are crucial for efficient information retrieval, interoperability with other knowledge systems, and the scalable development of terminological databases.

Conclusion

The presence of semantic ambiguity and the inconsistent use of terms in mining terminology highlight the need for their systematic reinterpretation through modern linguistic frameworks and digital lexicographic methodologies. Both classical and

contemporary research convincingly demonstrates that the thesaurus model provides an effective mechanism for the structured, consistent, and normative representation of terminological systems by explicitly modeling semantic relations between concepts [Aitchison et al., 2000:92; Dextre Clarke, 2016:138-144; Hjorland, 2016:145-159]. The findings of this study confirm that a thesaurus-based approach enables the clarification of semantic boundaries, reduces terminological variation, and supports the coherent organization of domain-specific knowledge. Beyond its theoretical value, this approach has clear practical relevance, particularly for the development of digital terminological resources, information retrieval systems, and standardized professional communication in the mining sector. Consequently, the interpretation of mining terminology on the basis of a thesaurus should be regarded as a necessary and promising direction for both linguistic research and applied lexicographic practice.

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