Жамият ва инновациялар –
Общество и инновации –
Society and innovations
Journal home page:
https://inscience.uz/index.php/socinov/index

Modeling conceptual frameworks for interdisciplinary terminology systems

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ARTICLE INFO

Article history:
Received June 2024
Received in revised form
15 July 2024
Accepted 15 July 2024
Available online
25 August 2024

Keywords:
cognitive terminology,
interdisciplinarity,
terminology.

ABSTRACT

This article explores how to represent semantic relationships between terminological units through a cognitive-discursive analysis of specialized languages. This approach is particularly relevant for terminologies in multifaceted fields.

DOI: https://doi.org/10.47689/2181-1415-vol5- iss4-pp113-118

Fanlararo terminologiya tizimlari uchun konseptual tizimlarni modellash

Kalit so‘zlar:
kognitiv terminologiya,
fanlararolik,
terminologiya.

ANNOTATSIYA

Ushbu maqola ixtisoslashgan tillarning kognitiv-diskursiv tahlili orqali terminologik birliklar orasidagi semantik munosabatlarni qanday ifodalashni o‘rganadi. Ushbu yondashuv, ayniqsa, ko‘p qirrali sohalardagi terminologiya uchun dolzarbdir.

Моделирование концептуальных основ для междисциплинарных терминологических систем

Ключевые слова:
когнитивное
терминоведение,
междисциплинарность,
терминология.

АННОТАЦИЯ

В статье рассматривается, как представлять семантические отношения между терминологическими единицами посредством когнитивно-дискурсивного анализа специализированных языков. Этот подход особенно актуален для терминологий в многогранных областях.

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INTRODUCTION

Interdisciplinarity manifests in various ways in the modern world, such as through universal scientific trends. Some scholars equate this term with "synthesis," where the synthetic nature of interdisciplinary research enhances the value of knowledge. This happens when issues and theories from one discipline are expanded, modified, and clarified through the lens of another discipline.

New scientific fields like quantitative linguistics, biochemistry, and geotechnics have emerged from prolonged interdisciplinary collaboration. Despite disciplinary boundaries, mutual understanding is achieved, a common language is developed to address and solve problems, and criteria for evaluating scientific achievements are shared.

In a "cognitive society," access to knowledge, its organization, and its application are crucial. It is essential to focus on individuals who are both the producers and recipients of knowledge responsible for classifying and exploring the information provided.

METHODOLOGY

This research employs a cognitive-discursive approach to analyze the terminology system of environmental audit. The study begins with the collection and review of 40 definitions of "environmental audit" from various sources, including dictionaries, legislative texts, and educational literature spanning from 1998 to 2012. Cognitive-discursive analysis is used as the primary methodological framework, facilitating the examination of how terms are represented and function within specific discourses. The methodology involves cognitive modeling to identify the unique characteristics of concept representation across different types of discourse. Additionally, both extralinguistic and linguistic aspects are considered to provide a comprehensive understanding of the conceptual framework. This includes evaluating extralinguistic factors influencing terminology development and comparing the formation stages of the subject area in Russia and abroad, as well as identifying principles of terminology formation, tracking trends in specialized language development, and highlighting significant terminology characteristics. Through this multifaceted approach, the research aims to elucidate the multilayered semantics of the term "environmental audit" and the dynamic nature of terminological systems.

RESULTS AND DISCUSSION

In this context, cognitive terminology raises new questions about languages for special purposes (LSP), the knowledge structures these terms represent, and the characteristics of professional communication, utilizing insights from corpus linguistics and other applied disciplines. Cognitive terminology emphasizes the importance of considering both the prototypical categorization of concepts (aligning with the new paradigm of terminology) and the realization of terms as markers of "intellectually mature" and well-defined concepts within specialized communication [1].

The primary functions of LSP are:

– to present a conceptual and linguistic representation of a specific knowledge domain;

– to facilitate professional standardization and adequacy of linguistic tools, serving as a repository for human knowledge and experience structures;

– to describe and communicate within a specialized knowledge area and promote its development [2].

These tasks become even more pertinent when context and discourse, viewed in their cognitive aspects as "verbally mediated activities in a special sphere," are factored into the process of term formation [3]. The cognitive approach to describing a terminological system involves a conceptual description of terms, which function as cognitive structures of specialized knowledge (as per the classical understanding of E. S. Kubryakova) [4].

To further develop this topic, it is essential to define the key concept: conceptual modeling is understood as the systematization and structuring of components of a specific fragment of the scientific world in the mental space of a specialist.

Within the cognitive-discursive approach, different authors view the terminology system as:

– A cognitive map [5], which involves stages such as identifying basic concepts, recognizing conceptual features, categorizing identical concepts, and presenting individual fragments and the entire science as diagrams [6];

– A conceptual sphere of science or its fragment [7], structured as a tree diagram where concepts are organized according to levels of linguistic categorization;

– Conceptual integration [8], representing the organic interaction of various mental spaces within a single conceptual sphere;

– A cognitive matrix [9], functioning as a system of interconnected cognitive contexts or areas of conceptualization of meaning;

– A frame-based network diagram [10], depicted as a contour or network superimposed on reality to extract conceptual information, which is then detailed based on prior experience.

The organization of any terminology, particularly emerging ones, results from a complex and lengthy process influenced by various factors and their interactions. The formation of a conceptual system determines the creation of terms as linguistic signs denoting special concepts. This concept is particularly applicable to the heterogeneous terminology of environmental audit, as classified by S. G. Kazarina [11]. The development of a new system for the economic support of rational natural resource use and environmental protection—environmental audit—necessitated the creation of a suitable lexical toolkit to facilitate effective communication and mutually beneficial partnerships.

Key steps in the conceptual modeling of environmental audit terminology include examining extralinguistic aspects (such as factors influencing terminology development and comparing the formation stages of the subject area in Russia and abroad) and linguistic aspects (such as identifying terminology formation principles, tracking trends in the development of specialized languages, and highlighting significant terminology characteristics).

At the initial stage of the research, 40 definitions of the term "environmental audit" were collected from various dictionaries, legislative texts, and educational literature from 1998 to 2012. The chosen methodological basis was cognitive-discursive analysis, which includes using cognitive modeling of definitions to identify how the concept is represented in specific types of discourse. This modeling can form the foundation for the development of professional concepts and the identification of specific semantic relationships in the process of terminologizing a linguistic sign within environmental discourse.

A critical review of Russian and foreign legislation, environmental and economic literature, and an analysis of definitions of the discipline's fundamental term reveal several key approaches to understanding environmental audit:

1. An independent, comprehensive, documented assessment of a business entity's compliance with environmental protection requirements, including regulations, norms, and international standards, along with recommendations for improving such activities (Federal Law "On Environmental Protection", "Geoecology and Nature Management: Conceptual and Terminological Dictionary" [12]);

2. An objective, independent analysis and assessment, accompanied by appropriate recommendations and proposals based on the actual results of any environmentally significant activity ("Ecology and Nature Protection: Dictionary and Handbook" [13]);

3. Environmental audit (inspection) of projects or companies, which involves assessing the environmental impact of existing facilities and independently evaluating compliance with environmental legislative and regulatory requirements ("Ecological Encyclopedic Dictionary" [14]);

4. A component of environmental management involving an objective, systematic, documented, and regularly repeated audit of an enterprise's state of environmental protection ("Economic Encyclopedia" [15]);

5. Auditing the activities of an economic entity to assess its impact on the environment and establishing compliance of these activities with certain audit criteria (using economic and mathematical methods ("Economic and Mathematical Encyclopedic Dictionary" [16]);

6. Systematic monitoring of the impact that the company's production activities have on the environment ("Management: Dictionary-Reference"[17]);

7. The branch of environmental law ("Legal Encyclopedic Dictionary"[18]);

8. Environmental control associated with the company's production methods ("International Trade: Terminological Dictionary"[19]);

9. Economic and legal instruments for stimulating environmental activities to increase investment attractiveness [20].

In the course of the definitional analysis of the lexical unit environmental audit, an integrated model of the named macroconcept was identified using terms from related scientific industry areas (indicated in brackets):

– consulting on environmental payments (economics);

– control over environmentally hazardous aspects of the functioning of an economic entity (ecology);

– assessment and management of environmental risks and damages, minimization of harmful impact factors (insurance);

– strategic environmental audit used in the development and analysis of investment projects, drawing up business plans (business);

– design of environmental management systems (EMS) under current requirements and standards (management);

– environmental certification and certification (marketing);

– development of environmental sections of project documentation (jurisprudence).

Modern terminologists do not view polysemy in such cases as a disadvantage of a terminological unit. The existence of diverse and sometimes contradictory definitions (e.g., audit as a process versus audit as a result) related to the same concept is a cognitive mechanism that plays a functional role in constructing and transferring knowledge. Each definition reflects different facets of the concept [21]. By analyzing numerous concepts and studies on this topic and categorizing the general areas of this subject, we can present a comprehensive audit in the following blocks:

1. Ecological: assessment of landscape-geographical and resource characteristics; analysis of ecosystem disturbance and environmental degradation levels; evaluation of self-renewal and self-regulation capacities.

2. Economic: assessment of the use of fixed assets; analysis of production costs; evaluation of waste flow.

3. Social: opinion on demographic policy; assessment of migration and reproduction processes; analysis of the standard of living.

By generalizing the recorded definitions of the fundamental term and analyzing various classifications within the discipline, it can be asserted that cognitive analysis reveals the "multilayered semantics of the term" [22]. This includes the semantics of a specialized term, developed through its use in languages for special purposes, and the general language semantics of the same term, as reflected in dictionaries for non-specialists. In this context, terms and terminological systems are seen as "dynamic constructs that emerge in discourse and evolve in content and form through the process of cognition" [23].

CONCLUSION

Based on this, an important step in analyzing any industry terminology system, particularly an inter-industry and heterogeneous one, is identifying its conceptual structure to establish the positions of at least the core concepts. This is practically valuable as it provides a clear understanding of the conceptual framework that underpins the complex relationships within the subject area.

In studying interdisciplinary terminology systems, conceptual modeling helps to depict the architecture and organization of a specific set of terminological units. It also clarifies the hierarchy of its elements and the types of internal connections that enable the terminology system to function and evolve independently.

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