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The Notion of Term and Terminology: Theoretical Foundations, Hypothesis, and Paradigmatic Structure in Scientific Discourse

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ABSTRACT

This study investigates the notions of term and terminology in terms of theoretical foundations in a broad linguistic as well as scientific context, and it focuses on revealing their paradigmatic features and importance in scientific discourse. The research emphasizes the matter of how terms function not as separate lexical units but as components of interrelated notional systems, which have an integral role in evolving modern scientific fields, such as artificial intelligence, which is developing rapidly. To achieve this goal, a broad methodological scheme was utilized, including descriptive, semantic, comparative, and structural-semantic analyses reinforced by materials from linguistic monographs, recent research articles, and terminological dictionaries. The outcomes show that the terms own key principles, such as substantial, functional, and derivative, and these principles enable terms to perform crucial roles in a scientific context, containing nominative, communicative, systematizing, and standardizing functions. Additionally, the implications emphasize that paradigmatic connections are crucial for structuring terminology by establishing terms within stratified, semantically linked systems, thereby ensuring clarity and consistency in knowledge representation across diverse disciplines. Finally, the research demonstrates that the paradigmatic system of terminology highlights the need for more investigation of the dynamic progress of terminological systems across interdisciplinary and multilingual settings.

Keywords

artificial intelligence, linguistics, principles, term, terminology, terminological system, theoretical foundations, hierarchical relationships, nominative, derivative, substantial, transliteration, standardization, systematizing, clarity, stability.

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Introduction.

A language's terminological system plays a crucial role in the development of science and technology. Every field, such as linguistics, medicine, and artificial intelligence, has its specific terms, and these terms are used throughout the subject area. Therefore, an analytical study of the notions “term” and “terminology” and their theoretical foundations, formation, and semantic features, as well as adapting to another language, is considered to be vital. Terminology is considered to be a branch of applied linguistics, and it is regarded as an interdisciplinary sphere naming the ideology of particular fields (Cabré, 1992). Dadaboev (2019) points out that terms are words that have been taken from a particular language or have been created artificially. The function of these units as linguistic elements is to carry particular knowledge across a given discipline. Unlike the vocabulary used daily, terms convey a certain and clearly characterized concept within a particular context. Moreover, the evolution of terms acts in accordance with particular linguistic and non-linguistic principles. Owing to a linguistic feature, terms can be formed by derivation, compounding, borrowing, and abbreviation processes. According to a non-linguistic feature, the formation of a new ideology within various disciplines requires the emergence of new concepts, and this reflects the progressive nature of terminology within scientific develop-

ment. Thus, terminology study comprises analysing individual terms and the exploration of their alliance, and makes it an important research area in current linguistics.

2. Methods and materials (methodology)

The research focuses on identifying and analyzing the paradigmatic essence of terminology and theoretical and practical research methods that have been used in terminology. Research methodology has been formed by a systematic analysis approach (Gough et al., 2012), which creates an opportunity to reveal the paradigmatic essence of terminology. Apart from this, data collection and data analysis methods help to determine the internal structure of terms, while semantic and comparative methods allow for highlighting substantive and functional features of paradigmatic connections. This methodological approach maintains that the research results are scientifically justified.

1. Structural-systematic analysis method.

This method has been used to determine the link between terms as well as their position within the system and hierarchical relationships with one another. For instance, paradigmatic lines such as *artificial intelligence, machine learning, and deep learning* have been analyzed systematically to show how each term is linked to the others. Except for this, the term *neural networks* has two subdivisions, such as *convolutional neural networks (CNNs)* and *recurrent neural networks (RNNs)*, and this shows the structured and systematic view of the research.

2. Data collection.

The data for this research were collected from diverse and reliable sources to maintain accuracy. Fundamental data includes terminological elements extracted from research articles, the monographs and articles related to linguistics and terminology, and explanatory dictionaries.

The essence of the concept “term.”

The word “term”, coming from the Latin language *terminus*, denotes the meanings of *last spot, border,* and is regarded as the phrase signifying a particular concept in some field. Vinokur (1961) mentions the need for the creation of terms and links this process to the subject area in which they are used. He also claims that this necessity is because of the usage of these terms in those fields. Gerd (1991) states that terms are phrases arising throughout the period when science and technology are in progress, and they refer to a particular meaning. Axmanova (1966) points out that the need for terms arises when a specific field reaches the top of the development, and these terms are coined after they convey a specific meaning; thus, they cannot be defined. Danilenko (1971) claims that any industry development that is happening in society prioritizes terminology matters first, and this process is used in practice by means of the transformation of terms. Hojiyev (1996) makes explicit that the words “termin” and “atama” in the Uzbek language should not be used as synonyms. The reason for this is that terms belong to the language of science and technology, and the word “atama” refers to a particular name denoting a specific notion. Except for this, he defines the word “istiloh” and states that this word is used in the terminology of historical sources.

The notion of “terminology”.

The notion of terminology is regarded as a set of lexical units used in a particular sphere, and terms are systematic in terminology. Terminology is a process taking place at the time when the field reaches the top development (Akhmanova, O. S. (1966). *Dictionary of linguistic terms*. Soviet Encyclopedia). For instance, some terms related to the artificial intelligence field, such as “machine learning”, “deep learning”, “database”, “reinforcement learning”, etc., emerged and evolved as a result of the deep learning of the target field. Terminology is a collection of specific notions that are systematically joined together, denoting the categorical apparatus of various scientific fields and precise perspectives (Lotte, D. S. (1961). *Foundations of the construction of scientific and technical terminology*. Moscow: Academy of Sciences of the USSR). The emergence and evaluation process of terminology occurs by means of word formation rules and the lexical range of a particular language (Dadaboev, H. (2019). *Uzbek terminology: A study guide*. Yoshlar Publishing House). Wüster (1968) claims that the notion of terminology is regarded as a special science connected with chemistry, biology, linguistics,

medicine, and computer science as well. From his perspective, terminology is connected with computer science more, and computer science is a key to terminology. The reason for this is that shaping the thesaurus of various terms is a process that takes place within computer science. Lesnikov (2024) mentions that it is vital to characterize linguistic terminology and distinguish its distinct systematic features and paradigmatic relations provided by observations of linguists, particularly those who have compiled terminology dictionaries and insights from language studies.

3. Data analysis

I analyzed the collected data utilizing the combination of structural-systematic, semantic, and comparative approaches. Initially, the semantic analysis method was organized to determine the meanings of chosen terms and to identify their connections. This procedure empowered the interpretation of how particular terms serve within a wider conceptual system. Moreover, the comparative method was utilized to compare the similarities and discrepancies in terms of evolution, systematic organization, and semantic correlations. Besides this, substantial, functional, and derivative principles of terms are compared in this research. Nominative, communicative, standardization, and systematizing functions of terms are also compared in this study. Referring to terminology, the essence and subject matter of terminology are comparatively discussed further. Semantic relations between terms are addressed as well. The outcomes of these analyses were portrayed qualitatively, and this allows us to comprehend the paradigmatic notion of terminology.

3. **Results**

1. Characteristics of terms

Terminological principles show the formation, structure, and interpretation of terms across a particular field. They form the basics of specialized language and enable specialists to exchange data accurately. This means that terms clearly represent particular units in a discipline. Therefore, the progress of terms demands a deep comprehension of the ideological system of the target discipline.

According to the findings of the study, the following principles are followed in the usage of the word “term”:

1. Substantial principle. The term should have scientific importance. To exemplify, the term “algorithm” refers to the order of steps that is used to tackle a particular issue. The essence of this term is kept the same in every language.
2. Functional principle. The function of the term in linguistics and scientific communication depends on the field in which and how it is used. The following table illustrates the functions that terms perform:

№	The function	Note	Examples
1	Nominative function	The primary function of the term is that it is the name of a particular concept belonging to a scientific field	The term *artificial intelligence* refers to a system that can fulfill some tasks as the human brain does
2	Communicative function	Using terms, experts can exchange various data, scientific knowledge, and other information with one another precisely	*This theorem is one of the most vital ones in algebra.* The terms algebra and theorem in this statement show the precision of data transfer
3	Systematization function	Terms do not exist independently, but they exist within the terminological field of a particular field	Terms such as *computer, internet, web page, and online* refer to the system of terms that are linked logically

№	The function	Note	Examples
4	Standardization function	Terms must have a unique, standardized, and scientific form to be used in science and education	The term *“artificial intelligence”* in English is translated into Uzbek as *“sun’iy intellekt.”*

3. Derivative principle. According to linguists, terms differ from ordinary words, and the following features of terms are distinguished:

- Clarity. Every single term refers to a certain object, and if it comes in the context, the meaning of the term will not change at all. For instance, the terms such as *marketing, computer, transport, and internet,* regardless of the context they are used in, always denote the same meaning.
- Stability. As time goes by, the term does not lose its meaning and form, continuing to save them. For example, the term “marketing” was introduced by McKovern in the second half of the 19th century, and until now, this term has been denoting only the meaning, that is, trade and commerce.
- Systematicity. The term may have systematic and paradigmatic connections with other terms. To exemplify, terms such as *bit, byte, megabyte, and terrabyte* specify measures related to computer science, and these terms refer to a particular volume that can be used to store information. Referring to the paradigmatic link between terms, the term *method* is linked with the terms *strategy* and *formula* by means of a synonymic paradigm.
- Emotional neutrality. Terms do not have a connective feature, and they do not express any feeling or emotion. For example, terms like *algorithm, formula, and method* belong to mathematics, and none of these terms is emotional.

2. Characteristics of terminology

In its turn, the notion of terminology denotes two meanings:

1. Terminology is the collection of terms within a particular field. In this case, the essence of the terminology notion is substantial, and it should be kept in mind that terminology is, first of all, a set of words and phrases expressing exact meanings and is utilized in a particular sphere. Additionally, it illustrates the lexical group of some fields like technology and industry, as well as a professional activity. These lexical sets refer to the concepts of a field. For example, terms such as *neural network, generative model, and token* are terms that are used within AI terminology.
2. Terminology is the science of studying terms. In this case, terminology refers to the methodology that pertains to a set of terms. Terminology, as a science, explores the structure and semantic features of terms, paradigmatic and syntagmatic relationships, translation, equivalence, and standardization matters, as well as the formation process of terms.

The following features can be seen as the subject matter of terminology:

1. Linguistically, terminology is regarded as a specific functional category of a particular language. Terms denote meanings in contrast to the vocabulary used in real-life scenarios. Additionally, they are not multi-faceted and serve for scientific communication. For instance, a *network* is a word used in real life, and a *computer network* is a term used in computer science.
2. Logically, terminology illustrates the system of scientific terms referring to particular scientific terms. For example, *mathematics – geometry – theorem – Pythagorean theorem* or *artificial intelligence – machine learning – deep learning – neural network* present a set of terms related to math and AI fields.
3. Systematically, terminology is not only a particular set of terms, but it is also an entire system, and every single term, linked with other terms in usage, has its own place within this system. To exemplify, some terms, such as *algorithm, model, database, and training–testing* in AI terminology, refer to the system of terms connected to one another.
4. Semantically, terminology maintains synonymic, antonymic, polysemy, and hyper-hyponymy relationships between terms. The following table provides some examples related to the relationship between terms:

№	Relationship	Examples
1	Synonymous	*artificial intelligence* in English and *sun’iy intellekt* in Uzbek refer to the same notions in general

№	Relationship	Examples
2	Antonymous	*Supervised learning* and *unsupervised learning* refer to opposite meanings in English
3	Polysemy	*Mouse, web, platform,* nominate various concepts across different spheres
4	Hyper-hyponymy	*Artificial intelligence* and *neural networks have* a hierarchical meaning

5. Paradigmatically, terminology refers to terms used within the same category. In this context, terms belong to a specific semantic field. Some terms, such as machine learning, semi-supervised learning, self-supervised learning, and deep learning, which are used in AI terminology in English, exemplify the paradigm of learning types. These terms refer to concepts that are distinguished by a common broader category.
6. Derivationally and socially, terminology can create new terms, and this process will continue to evolve alongside the development of science and society. For example, the term *programm* is derived from *programming* and *computer* from *computerization.*

Terminological expressions change and evolve depending on human lifestyle and activities. Qosimov (1985) claims that this process requires the development of new terms as well as terminology within the field of science.

Discussions

The results of this research include the paradigmatic essence of terminology. The study shows that terms do not exist in isolation; instead, they operate within a connected system of concepts. This confirms that terminology is systematic and closely related to the logical structure of scientific thinking. According to several linguists, terminology is regarded as a part of lexicology, as both have similarities, such as dealing with words, having theoretical and applied sides, and being concerned with dictionaries. However, Cabré (1999) states that terminology deals with terms, and lexicology deals with the study of words. Aligning with Cabré’s perspectives, I consider that both terminology and lexicology are branches of linguistics being close to each other, yet they vary in terms of their area of study and purpose. The subject area of terminology is terms, which are words or phrases, and they have exact meanings across a specific field, like medicine, technology, and linguistics. The main purpose of terminology is to study and standardize the terms in these fields. Terminology investigates the formation of terms and their hierarchical and paradigmatic relationships with one another. Referring to lexicology, which is the branch of linguistics, it addresses the vocabulary of a language in general. In contrast to terminology, lexicology not only includes specialized language, but it also contains words and expressions used in all contexts in real-life scenarios. Cabré (1992) also points out that terms are tools that connect the terminology to real life, representing real objects. According to his perspective, terms have linguistic, cognitive, and communicative functions. In addition to this hypothesis, I regard that terms possess nominative, systematization, and standardization functions as well.

The analysis also shows that paradigmatic relations help group terms based on similar meanings while also highlighting their differences. For example, in AI terminology, concepts such as learning types, neural networks, and algorithms demonstrate systematic, classificatory connections among these terms. Sager (1990) claims that, in contrast to syntagmatic relations, which are concerned with a linear arrangement of concepts in a communication paradigmatic relations deal with the axis of selection, identifying which terms can substitute one another due to semantic, conceptual, and functional features. Aligning with Sager’s ideas, it can be stated that syntagmatic and paradigmatic connections depict two diverse methods in which language is arranged. That is, syntagmatic relations portray how terms are organized according to the sequence, and paradigmatic relations indicate which terms can be replaced with one another, expressing similar meanings. This emphasizes the importance of paradigmatic links in organizing and clearly defining scientific concepts. Additionally, the study reveals that paradigmatic relationships across various scientific fields follow general principles. Paradigmatic sets are represented by language levels, lexical-semantic relationships, and phonological units in linguistic terminology. Likewise, in fields such as information technology and AI, methods of learning, types of models, and metrics of evaluation illustrate corresponding systematic connections. This verifies the comprehensive nature of terminology as a linguistic occurrence.

The discussion also revealed that paradigmatic connections strengthen the communication efficiency of terminology. In scientific communication, the placement of phrases within paradigmatic frameworks enables the coherent flow of knowledge, sets conceptual constraints, and accelerates and improves comprehension. In particular, in the rapidly evolving scientific and technological advancement setting, to maintain terminological stability, newly emerging terms need to align with existing paradigms. Nevertheless, particular challenges were also determined throughout the study. In newly emerging terminological systems, paradigmatic connections may not be completely stabilized. This is particularly evident in AI and information technologies, where terminology is rapidly evolving and used in diverse forms. Auger (1989) states that advanced, intelligent tools will be used in the future to collect and organize terms from big information sources, and

this allows terminology experts to deal with the terminology system rapidly with less effort. Nevertheless, I would like to claim that despite advanced tools, terminology specialists will still need remarkable involvement of humans, as these machines cannot be completely replaced with expert decision in terms of grasping the meaning, and clear definitions. Consequently, constraints between terms related paradigmatically might sometimes remain confusing. A comparison of the findings with existing scholarly perspectives shows that the paradigmatic nature of terminology is fundamentally connected to its core features — systematization, precision, and logical consistency. In this context, paradigmatic relations serve as one of the basic mechanisms that support the semantic and structural organization of terminology.

Overall, this research shows that the paradigmatic nature of terminology serves as a crucial tool for organizing, classifying, and systematizing scientific concepts. Future research could examine the dynamics of terminological system progress, how new terms are integrated into existing paradigms, and conduct contrastive analyses of terminological examples across different languages.

Conclusion

This study aimed to explore the paradigmatic nature of terminology from both linguistic and logical perspectives. The results confirm that terms do not function as independent units but as parts of an interconnected conceptual system. Paradigmatic relations maintain the systematic nature of terminology by identifying common semantic features and distinguishing characteristics among terms. The research findings highlight the remarkable role of paradigmatic links in classifying terms, organizing them in a structured way, and clearly defining scientific ideology. Investigations done in linguistics and artificial intelligence demonstrate that paradigmatic relations evolve owing to common principles across different disciplines. This further supports the view of terminology as an adaptable scientific occurrence. Moreover, the study establishes that paradigmatic relations contribute to the communicative efficiency of terminology by enabling accurate and coherent expression of scientific data and reflecting the logical structure of scientific thought. The arrangement of terms within paradigmatic systems plays a crucial role in structuring knowledge and regulating the formation of new terms. The findings also illustrate that the paradigmatic nature of terminology represents one of the fundamental theoretical foundations of terminological studies. At the same time, the rapid progress of modern science and technology requires a deeper analysis of the formation of paradigmatic relations in emerging terminological systems. Future research directions may include contrastive analyses of terminological paradigms across languages, the identification of mechanisms underlying the synthesis of new terms into paradigmatic systems, and the study of the progressive act of terminology.

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