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Specialized Vocabulary In Scientific And Technical Texts: Functional Classes And Their Linguistic Characteristics

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Abstract: The article explores the functional and semantic classification of specialized vocabulary in English- and German-language scientific and technical texts. Special attention is given to industry-specific terminology and its relationship with other classes of specialized lexical units, including nomenclature names, pragmonyms, professionalisms, and terminoids. The study analyses their defining features, degree of standardization, semantic precision, and communicative functions. The findings show that the distribution of these lexical categories is largely similar across English and German scientific and technical genres. Terminology constitutes the dominant class, while popular science texts exhibit a higher proportion of nomenclature units and pragmonyms. The observable similarities across languages indicate ongoing internationalization of scientific communication, which contributes to more effective intercultural professional exchange. The results may be used in linguistic research, terminology studies, as well as in developing scientific and educational materials in English and German.

Keywords: Specialized vocabulary; terminology; nomenclature; pragmonyms; terminoids; professionalisms; scientific and technical texts; functional stylistics; terminological systems; internationalization of scientific discourse.

Introduction: The study of the language of science and technology is a promising field of linguistic research, since continuous scientific and technological progress is inevitably reflected in language: new specialized lexical units are created to designate recent technical inventions. Numerous terminological works focus on the language of individual technical fields, primarily on terminology. However, other classes of specialized vocabulary and their distribution in scientific and technical texts have not received sufficient attention to date.

Typology of Industry-Specific Vocabulary.

Types of specialized lexical units have repeatedly been discussed and refined in terminological scholarship [1, pp. 20–53; 5, pp. 72–73]. In our view, industry-specific (specialized) vocabulary in scientific and technical texts comprises lexical units that denote objects and phenomena specific to a particular field of knowledge. This vocabulary includes terms, nomens, terminoids, professionalisms, and pragmonyms [4, p. 16].

Industry-specific terminology occupies a central place within specialized vocabulary. It is a systematically organized body of terms belonging to a particular scientific discipline or technical field, continuously evolving under the influence of linguistic and extralinguistic factors.

Terms constitute the most important category of specialized vocabulary because they identify the objects and concepts of a given scientific domain. The key features of a term include correlation with a special concept, systemic character, and the presence of a definition. The desirable qualities of an ideal term are precision, monosemy, independence from context, absence of synonyms, brevity, stylistic neutrality, logical consistency, and suitability for forming derived terms [1, pp. 25–41; 4, pp. 27–32; 9, pp. 25–28]. In practice, not all terms possess these ideal

characteristics.

A term is distinct from other lexical items in that it is created artificially to designate a specialized concept. Endogenous terms formed through native word-formation patterns are motivated, whereas loan terms may lack motivation or convey false motivation.

In contemporary scientific and technical texts, the use of one-word terms is decreasing, since they often cannot denote complex technological processes, artifacts, or their properties. Consequently, English and German exhibit an increasing number of multi-word terminological combinations with more than two semantic components. As T.A. Kudinova notes, "The predominance of multi-component terminological combinations in modern scientific and technical texts is caused by the need to nominate complex composite concepts and to specify professional objects and concepts as their essence becomes better understood" [2, p. 58; see also 8, p. 68; 9, p. 87]. Such combinations allow for greater conceptual specificity and clearer distinction between related notions.

A term serves as the precise linguistic label of a scientific concept, denoting an object or process within a particular field of science. V.M. Leitchik and S.D.Shelov emphasize that this property is what defines a term [6, p. 84]. German terminologist Hartwig Kalverkämper highlights the crucial role of terminological units in the internationalization of professional communication [7, p. 44]. Indeed, many terms in different languages are based on Greek and Latin morphemes, contributing to their international character.

Current terminological systems tend toward nominalization. Without addressing the debate on the part-of-speech affiliation of terms, we note that terms may belong not only to nouns but also to verbs (e.g., German rundfunken 'to broadcast', landen 'to land') or adjectives (e.g., flugfähig 'airworthy').

Other Types of Specialized Vocabulary.

Nomens constitute the second most significant class of specialized vocabulary after terms. In technical language, they denote specific serially manufactured models and types of devices—aircraft, engines, radars—as well as unique entities such as company names (e.g., Airbus, Boeing). A nomen typically contains alphanumeric elements, each carrying meaning. Examples:

- A320 — narrow-body, 150-seat passenger aircraft with fly-by-wire control (base model of the Airbus medium-range family).
- A320neo — modification of the A320 family (neo = New Engine Option).
- Airbus A300-600ST — wide-body cargo aircraft for transporting large components (ST = Super Transporter).

Example from a German-language aviation dictionary:

"Airbus A300-600 ST Beluga: mit 1.400 m³ der weltweit größte Frachtraum zum Transport der Airbusteile."

— "Airbus A300-600 ST Beluga: with 1,400 m³, the world's largest cargo compartment for transporting Airbus components."

Adding a new structural element to a nomen changes its meaning.

Pragmonyms are commercial names and trademarks created by manufacturers for marketing and promotional purposes. Some authors use the term pragmatonym as a synonym [cf. 3]. A pragmonym highlights a positive or distinctive feature of an object. Example: In Airbus A300-600ST "Beluga", the word Beluga is a pragmonym, chosen because the aircraft resembles a beluga whale. A pragmonym may occur independently of the nomen: "Die 'Beluga' fliegt in einer Höhe von 10.700 m …" — "The Beluga is flying at an altitude of 10,700 m …"

Professionalisms are unofficial, non-standardized names of special concepts. They often possess emotional coloring or metaphorical imagery.

Example: German Bauchlandung — literally "belly landing," meaning emergency landing without landing gear.

They are typically used in informal spoken communication in the workplace. The boundary between terms and professionalisms is not always clear.

Terminoids are characterized by context-dependence, lack of precise meaning, and the possibility of connotations. They lack fully established definitions: their semantic development is still in progress.

CONCLUSION

The proportion of functional and stylistic types of specialized vocabulary in English and German scientific and technical texts is generally comparable. In all analyzed texts, industry-specific terminology is the dominant lexical class. Popular science texts show greater lexical diversity due to the higher frequency of nomens and pragmonyms. Minor differences between English and German articles concern the relative share of nomens and pragmonyms.

The fact that scientific and technical texts of the same genre across different languages demonstrate similar patterns of specialized vocabulary use indicates a clear trend toward the internationalization of scientific discourse, which in turn enhances the effectiveness of

intercultural professional communication.

These findings are useful for investigating and composing popular science texts, academic articles, and educational materials in English and German. Future research may focus on the functioning of specialized lexical units in other genres of scientific discourse.

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