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LEXICAL-SEMANTIC CLASSIFICATION OF TECHNICAL TERMS IN ENGLISH, UZBEK AND RUSSIAN

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Abstract:
This thesis examines the lexical-semantic classification of technical terms in English, Uzbek and Russian. Technical terminology is a special layer of vocabulary that serves professional communication and reflects the conceptual system of science, engineering and technology. The purpose of the thesis is to identify the main lexical-semantic groups of technical terms in the three languages and to explain their similarities and differences. The study is based on descriptive, comparative and semantic methods. The findings show that technical terms may be classified according to the concepts they denote, including devices, processes, materials, properties, measurements, systems, operations and professional fields. English terminology is characterized by compactness and wide use of international terms, Russian terminology demonstrates a developed derivational and conceptual structure, while Uzbek terminology combines native, borrowed and translated units. The thesis concludes that lexical-semantic classification is important for translation, terminology standardization, technical education and multilingual communication.

Keywords: technical terms, lexical-semantic classification, English, Uzbek, Russian, terminology, technical vocabulary, semantics, translation, professional communication.

Technical terms are linguistic units used to name specialized concepts in science, engineering, production and technology. Unlike ordinary words, terms are connected with a definite field of knowledge and are expected to express meanings accurately. In modern professional communication, English, Uzbek and Russian technical terminology interact actively because scientific information, technical documentation and educational materials are often used in several languages.

The lexical-semantic study of technical terms is important because terminology is not only a collection of separate words. It is a system in which every unit is connected with a concept, object, process or function. Classification helps reveal how technical knowledge is organized in language. For example, terms may name machines, tools, mechanisms, operations, substances, properties, units of measurement, digital systems and technological processes. Such grouping makes it possible to understand the semantic structure of technical vocabulary and to compare how different languages represent similar concepts.

English is the dominant language of modern technology and innovation. Many new concepts first appear in English and then enter Uzbek and Russian through borrowing, calquing or translation. Russian has a long tradition of scientific and technical terminology and has influenced Uzbek terminology historically. Uzbek technical vocabulary is developing through national word-formation resources, Russian-mediated terms and direct borrowings from English. Therefore, the lexical-semantic classification of technical terms in these three languages is relevant for linguistics, translation studies and technical education.

The study uses descriptive, comparative and semantic methods. The descriptive method is applied to characterize the nature of technical terminology as a special lexical system. The comparative method helps identify similarities and differences among English, Uzbek and Russian terms. The semantic method is

used to classify terms according to the concepts they express and to determine their meaning relations within technical discourse.

The material for analysis includes commonly used terms from engineering, information technology, mechanics, energy and production. The selected examples show how the same technical concepts are represented in three languages. The theoretical basis of the study relies on terminology studies developed by E. Wüster, D. S. Lotte, V. M. Leychik, A. V. Superanskaya, S. V. Grinev-Grinevich, M. T. Cabré and J. C. Sager.

The analysis shows that technical terms in English, Uzbek and Russian can be classified into several lexical-semantic groups according to the nature of the concepts they denote. One of the largest groups consists of terms naming devices, tools and mechanisms. In English, examples include “engine,” “sensor,” “generator,” “compressor,” “controller” and “transformer.” Their Russian equivalents are “двигатель,” “датчик,” “генератор,” “компрессор,” “контроллер” and “трансформатор,” while Uzbek uses “dvigatel,” “datchik” or “sensor,” “generator,” “kompressor,” “kontroller” and “transformator.” This group shows a high degree of internationalization, especially in terms borrowed from Greek, Latin, English and Russian.

Another important group includes terms denoting processes and operations. English uses terms such as “processing,” “cooling,” “heating,” “welding,” “transmission,” “measurement” and “control.” Russian equivalents include “обработка,” “охлаждение,” “нагрев,” “сварка,” “передача,” “измерение” and “управление.” Uzbek terms include “qayta ishlash,” “sovutish,” “qizdirish,” “payvandlash,” “uzatish,” “o‘lchash” and “boshqaruv.” These terms are semantically connected with action and technological procedure. Uzbek often uses verbal noun forms, while Russian actively uses suffixes such as “-ние” and “-ка.”

A separate lexical-semantic group consists of terms naming systems and complexes. English examples include “control system,” “power supply system,” “cooling system,” “information system” and “automated design system.” Russian uses “система управления,” “система электропитания,” “система охлаждения,” “информационная система” and “автоматизированная система проектирования.” Uzbek equivalents are “boshqaruv tizimi,” “elektr ta’minoti tizimi,” “sovutish tizimi,” “axborot tizimi” and “avtomatlashtirilgan loyihalash tizimi.” This group is usually expressed through multi-component terms, and each component adds a specific semantic feature.

Technical terminology also includes terms denoting materials and substances. English uses “steel,” “alloy,” “plastic,” “fuel,” “conductor,” “semiconductor” and “insulator.” Russian equivalents are “сталь,” “сплав,” “пластик,” “топливо,” “проводник,” “полупроводник” and “изолятор.” Uzbek uses “po‘lat,” “qotishma,” “plastmassa,” “yoqilg‘i,” “o‘tkazgich,” “yarimo‘tkazgich” and “izolyator.” This group is important in engineering and production because material terms indicate physical composition and technical application.

Terms denoting properties, parameters and measurements form another semantic class. English terms such as “voltage,” “resistance,” “pressure,” “speed,” “capacity,” “frequency” and “efficiency” correspond to Russian “напряжение,” “сопротивление,” “давление,” “скорость,” “мощность” or “ёмкость,” “частота” and “эффективность.” Uzbek equivalents include “kuchlanish,” “qarshilik,” “bosim,” “tezlik,” “quvvat” or “sig‘im,” “chastota” and “samaradorlik.” These terms are semantically abstract because they name measurable characteristics rather than concrete objects.

The study also reveals the presence of digital and information technology terms as a rapidly expanding lexical-semantic group. English terms such as “software,” “hardware,” “database,” “algorithm,” “interface,” “network,” “server” and

"cloud computing" are widely used internationally. Russian translates or adapts them as "программное обеспечение," "аппаратное обеспечение," "база данных," "алгоритм," "интерфейс," "сеть," "сервер" and "облачные вычисления." Uzbek uses "dasturiy ta'minot," "apparat ta'minoti," "ma'lumotlar bazasi," "algoritm," "interfeys," "tarmoq," "server" and "bulutli hisoblash." This group demonstrates active borrowing and calquing.

The lexical-semantic classification of technical terms shows that English, Uzbek and Russian organize technical knowledge around similar conceptual groups, such as devices, processes, systems, materials, properties, measurements and digital technologies. These groups reflect the universal needs of technical communication, although their linguistic expression differs in each language.

English technical terms are usually compact and internationally widespread. Russian terms are morphologically developed and semantically clear. Uzbek terminology combines native forms such as "o'lchagich," "sovutish" and "boshqaruv" with borrowed international terms such as "generator," "sensor" and "server."

The main difficulty is terminological variation. One English term may have several Uzbek or Russian equivalents, for example "sensor" — "sensor/datchik" in Uzbek and "сенсор/датчик" in Russian. This requires standardization to avoid confusion in translation, education and technical documentation.

Thus, lexical-semantic classification helps choose accurate equivalents, improve multilingual dictionaries, ensure terminological consistency and develop professional language competence.

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