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## **The Influence of Latin and Greek Elements on the Development of IT Terminology in the Kazakh Language**

The purpose of the article is to determine the influence of Latin and Greek on the Kazakh IT terminology. In accordance with the tasks of the article, a review of the theory of borrowed words was conducted, the Greco-Latin roots were identified, and the frequency of use in the dictionary was determined. The study examined the relationship of classical languages with others and their role in the formation of scientific language. The influence of Latin and Greek borrowed words on Kazakh and the ways of their penetration were considered. The dictionary “Informatics and Computing Technology” (2014), containing 10,060 terms, served as study material. The article used a comparative historical method to identify Greek and Latin roots and Microsoft Excel was used to determine the frequency of occurrence of the identified Greek and Latin roots in the dictionary. The study identified 352 Latin and 165 Greek roots. Analysis in Microsoft Excel revealed that Latin roots appear 3,909 times and Greek roots 2,501 times, making Latin roots 1.54 times more frequent. Greek roots, though less frequent overall, show higher productivity. Each Greek-rooted word appears 15.1 times on average, compared to 11.1 for Latin, making Greek roots 1.36 times more common per unit. Their higher frequency indicates widespread use in terminology. The study presents these findings in a diagram and discusses the phonological adaptation of Greek and Latin borrowings in Kazakh. In Kazakh IT terminology, Latin roots make up 17.6 % and Greek 11.2 %, with a combined share of 29 %. This reflects the international aspect of IT terms and highlights the need to advance Kazakh terminology development, proving language convergence under globalization. The formation of IT terminology in English contributes to the lexical convergence of the Kazakh with the Greco-Latin languages. Although Latin is regarded as a dead language, it still exerts influence on living languages.

*Keywords:* IT terminology, Latin roots, Greek roots, borrowed words, absolute frequency.

### *Introduction*

The worldwide globalization of cultures, the development of information technology, and the growth of intercultural communication have contributed to the English language becoming the lingua franca. According to Crystal, the influence of English as a global language continues to grow daily, affecting other languages and serving as the foundation of their scientific vocabulary. In several nations, purist linguists express significant concern, arguing that English exerts undue influence on their languages. However, it is important to recognize that English has historically borrowed thousands of terms from other languages and created thousands more by adapting linguistic elements from diverse origins. Over time, English has incorporated terms from approximately 350 foreign languages, with more than three-quarters of its vocabulary consisting of words from classical or Romance languages [1; 23]. Languages with relatively small numbers of speakers, such as Kazakh — part of the Kipchak group of Turkic languages — are also influenced by English.

Greek and Latin borrowings play a significant role not only in the terminology of information technology but also in other scientific and technological domains. These borrowings enrich the language while contributing to the standardization and unification of terms at an organizational level, a factor of particular importance in the context of globalization and technological progress. Specifically, Greek and Latin roots are frequently utilized in coining new terms, ensuring the preservation of scientific precision and universality.

An important aspect of the coexistence of Greek and Latin borrowings is their adaptation to the contextual and grammatical norms of the recipient language. For instance, in English medical terminology, Greek and Latin terms have undergone contextual and orthographic modifications, making them more accessible to native speakers [2; 96]. This phenomenon is similarly observed in fields such as architecture

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and engineering, where internationalisms of Greek and Latin origin form a significant part of the terminological corpus [3; 52], [4; 2862].

Moreover, Greek and Latin borrowings aim to establish a unified terminological base, which is particularly relevant in rapidly evolving fields like information technology. For example, in the Latin medical tradition, the language continues to serve as a foundational tool for communication, supporting the creation and standardization of terms [5; 367], [6; 649]. This principle applies across other scientific disciplines where precision and clarity in terminology are paramount.

In recent years, Greek and Latin-derived terms in information technology have facilitated the creation of clearer and more comprehensible definitions for complex concepts and processes. For example, terms like “interface” (from the Latin *interfacere*) and “system” (from the Greek *systēma*) describe technologies and their functions, enhancing both understanding and learning [7; 130].

Thus, Greek and Latin borrowings not only enrich the language but also enable more effective knowledge and information exchange in an international context. The influence of Greek and Latin borrowings on information technology terminology is a multifaceted and multilayered process that involves both the adaptation and standardization of terms. These borrowings require adherence to precision and universality, which is especially critical in the context of globalization and rapid technological development.

In addition, Cabre categorizes the forms of loanword integration in historical contexts as follows:

- Loan terms from Greek or Latin, often referred to as neoclassical borrowings.
- Loan words from other contemporary languages, which are classified as true borrowings.
- Loan words from regional or social dialects or other subject-specific fields within the same language, which are generally not considered traditional borrowings.

In terminology studies, neoclassical derivations and compounds are more prevalent than in general language use, particularly in the natural sciences. International standards in terminology explicitly promote the incorporation of neoclassical roots and affixes when creating new terms to ensure a sense of international uniformity in designations [8; 88].

This research builds on the following theoretical assertions: borrowing is a historical process that can only be fully understood through historical linguistic approaches, as highlighted by Grimstad [9; 1], Haugen [10; 227], and Haspelmath [11; 35]; neoclassical words and word elements serve as fundamental sources for term creation, as emphasized by Cabre [8; 88] and Langslow [12; 36]; language contact is the driving force behind the formation of borrowed words, as argued by Thomason [13; 10], Gooskens, Kürschner, and van Heuven [14; 7], and Campbell [15; 64].

These theoretical perspectives underline the dynamic interaction between languages, particularly in scientific and technological contexts. The integration of Greek and Latin elements into modern terminologies exemplifies how linguistic borrowing functions not merely as a process of lexical enrichment but also as a mechanism for achieving clarity, precision, and international cohesion in specialized fields.

The objective of this research is to determine the level to which the terminology of information technology (IT) in the Kazakh language aligns with international principles or adheres to national principles by identifying the Greek and Latin roots present in its lexicon. To achieve this goal, we will identify Greek and Latin roots in IT terminology and calculate their frequency of occurrence in relevant dictionaries. Additionally, the study will explore how these borrowed roots have been adapted into the Kazakh language. To date, no quantitative studies focusing on Latin and Greek loanwords have been conducted in relation to the Kazakh language's terminology. This makes the research particularly significant for understanding the lexical composition of the Kazakh language. Through this study, we aim to reveal not only the influence of English on the Kazakh language but also the impact of Greek and Latin, thereby shedding light on broader linguistic interactions in the development of scientific and technical terminology.

### *History and relation of classical languages with other languages and its significance in the formation of the language of science*

After Alexander the Great's conquests (356–323 BC), the Greek language spread throughout the Near and Middle East. Approximately 400 years later, the Christian apostles utilized Greek to disseminate their teachings to the West (notably, the words “Christ” and “apostle” are of Greek origin). At the time of Aristotle and Alexander, Rome was still a relatively small city on the world stage but was gradually gaining significance on the Italian Peninsula. Within 200 years, Rome dominated much of the Mediterranean, including the ancient Greek city-states. By the first century AD, the vast Roman Empire extended from the Atlantic Ocean to the Black Sea and from Egypt to the British Isles. Latin, originally an Italic dialect spoken in and

around Rome, had by then become a widely spoken and written language across most of Western Europe [16; 5].

Even after the Romans conquered the eastern Mediterranean, Greek continued to serve as the *lingua franca* of communication in that region. Beginning in the 2nd century BC, Greek significantly influenced Latin, and consequently, almost every other language either directly or indirectly. While Greek remains the national language of Greece today, its historical influence extends well beyond the country's borders [17; 12], [18; 111].

The Italic languages, part of the Indo-European language family, emerged in central and southern Italy in the early 8th century BC. Latin, a member of this group, was initially spoken in the Lazio region. During its formative period, Latin was profoundly influenced by the languages of neighboring peoples, such as Etruscan and Greek (specifically Koine Greek, adopted in Magna Graecia, which consisted of numerous Greek colonies established in the southern parts of the Italian Peninsula).

Latin eventually adopted what is now known as the "classical Latin alphabet", which itself was an adaptation of the Greek alphabet. The Etruscans, through their commercial interactions with the Greeks in Magna Graecia, had incorporated this alphabet into their writing system. By the late 8th century BC, this alphabet had begun to be used more widely. The Romans subsequently borrowed the alphabet from the Etruscans, modifying certain elements to suit their own phonetic needs. For example, while the Etruscans wrote from right to left, both Latin and Greek evolved to be written from left to right. Additionally, modifications were made to include new letters absent in the original Greek alphabet, tailoring it to reflect the unique phonetic characteristics of each adopting language.

By the 8th century, the classical Latin alphabet had been adopted by many languages in Europe and parts of Asia. Latin coexisted with Koine Greek, which it could not supplant due to the latter's status as a powerful cultural and intellectual language in the eastern Roman Empire. Latin, however, became the dominant language in the western part of the empire. Like all languages, Latin was never entirely homogeneous; it exhibited numerous variations based on geographical region, social class, gender, education level, and the native languages of its speakers [19; 81].

In Roman times, Latin was not widely employed for theoretical, scientific, or philosophical research. Upper-class Romans were often fluent in Greek, and it was common for parents to send their children to Greek schools in the eastern regions. For official purposes, the Roman Empire used Latin in its western territories and Greek in the eastern ones. Consequently, translating imperial documents, decrees, and other official texts from Latin into Greek was a routine practice. However, few literary, philosophical, or scientific works were translated between the two languages. Many believed that Latin was inadequate for conveying complex intellectual concepts, which were thought to belong to a Greek *Denkstil* (thought style) and therefore best studied in Greek [20; 158].

After the collapse of the Roman Empire, Latin preserved its cultural legacy and further developed as the language of sciences, including anthropology, chemistry, geology, and medicine. It evolved into *Latinus Scientificus*, or Scientific Latin. Although Latin borrowed extensively from Greek during the Roman period (753 BCE–CE 476), the classical Latin revered by later scholars originated from the central period of its history, roughly 100 BCE to CE 50. During the European Renaissance, classical Latin was idealized by scholars, and its literature became a model for academic and literary pursuits. This version of Latin evolved into Church Latin, which remains in use today. Although no longer a spoken language, Latin survives in its modern descendants — Romance languages spoken across southern Europe. Furthermore, Latin continues to be taught in educational institutions worldwide and remains the official language of Vatican City [21; 35], [19; 81–106].

Romance languages, particularly French, are often considered modern-day Latin, retaining much of its structure and essence. While English is primarily Germanic in form and vocabulary, a significant portion of its lexicon is derived from Latin, often through French. Everyday English words tend to have Anglo-Saxon roots, but as the language moves from describing primitive to more sophisticated concepts, it increasingly incorporates Latin-derived terms [22; 18]. A substantial influx of Latin-based vocabulary entered English following the Norman Conquest of England in 1066, when the Normans brought their French language with them [23; 10].

In their research article, Culpeper and Clapham (1996) provide quantitative insights into the number of words borrowed into English. Their study investigates the volume and timeline of English borrowings from classical languages (Greek and Latin) and Romance languages (French, Italian, Spanish, and Portuguese). The findings, based on the Oxford English Dictionary's identification of primary donor languages and first

citation dates (1989), highlight the profound influence of Latin and French on English, with Latin exerting the greater impact. During the Renaissance of the 16th century, Latin contributed approximately 7,000 terms to the English vocabulary, with borrowing peaking between 1600 and 1675. Greek borrowings, followed by Latin and French, peaked in the 19th century. French borrowings, which peaked between 1251 and 1375, declined after 1525, except for a slight resurgence in the 18th century, fueled by the growing influence of French culture. In total, French contributed around 11,000 terms to Middle English vocabulary [24; 218].

#### *Entry of Latin Greek words into Kazakh language*

Every language has principles for creating terms. In the field of terminology, adherence to these principles has given rise to traditions of both international and national term formation. The development of terms in the Kazakh language has followed different trajectories, shaped significantly by the country's political and historical events over the centuries. The terminology of the Kazakh lexicon can be divided into four main stages:

Second half of the 19th century to the 1910s — Period I

1910 to 1930 — Period II

1930 to 1990 — Period III

1990 to the present — Period IV

Each period has distinct characteristics. However, the periods spanning 1930 to 1990 and 1990 to the present are particularly significant for the development of the Kazakh scientific lexicon. In 1930, the All-Union Party Meeting in Moscow thoroughly examined the question of terminology development in national languages. During this time, the foundational scientific principles for creating terms in the languages of the USSR were established. This led to the establishment of the Commission on Technical Terminology of the Academy of Sciences of the USSR in 1933, later renamed the Committee on Scientific and Technical Terminologies. That same year, the State Terminological Commission was established in Kazakhstan, functioning under the language policies of the USSR [25; 87, 111].

The Russian language exerted significant influence on the languages of countries within the USSR. Greek and Latin influenced Russian at various stages of its linguistic development, driven by political and historical changes in the state.

Latin and Greek words entered the Russian language not only through English but also due to the cultural development of Russia during the 18th century. Western languages, particularly French and German, significantly influenced Russian vocabulary, with Latin and Greek borrowings primarily appearing in scientific and cultural contexts. Interestingly, some borrowed terms assume a more “Latinized” form in Russian than in their original source languages due to the closer alignment of Latin pronunciation with Russian phonetics. For example, terms such as tendency and republic, borrowed from French, retain a more Latin-like form in Russian [26; 177].

Greek also played a pivotal role in shaping the culture and language of Ancient Russia. During the era of Kievan Rus, active trade relations with Byzantium — a hub of Greek culture — brought Greek influences into Russian. This interaction began before the adoption of Christianity in the 6th century and intensified with the spread of Christian culture. The baptism of the Eastern Slavs in the 9th century and the subsequent use of liturgical texts translated from Greek to Old Church Slavonic further facilitated the penetration of Greek vocabulary into Russian. This influence remains evident today in scientific, medical, and philosophical terminologies [27; 119].

While this article does not aim to establish the exact timeline of Greek and Latin vocabulary incorporation into Russian, it underscores Russian's role as an intermediary language in the development of information technology terminology in Kazakh.

During the Soviet era, a centralized translation strategy significantly increased the borrowing and calquing of Russian terms into other Soviet languages. This was due to a program requiring literary works and technical texts to first be translated into Russian and then into other languages spoken within the USSR. As a result, these languages, including Kazakh, adopted extensive shared vocabulary and terminology [28; 420].

Following Kazakhstan's independence from the Russian Empire, the Russian language maintained its influence in education, particularly in technical institutions. For instance, in 1989, the Almaty Polytechnic Institute (now named after K.I. Satbayev) established the first Kazakh-language information technology groups. However, since most educational materials were in Russian, these groups participated in translation efforts throughout their studies. At the time, no standardized translations of specialized terms existed, and IT

terminology was still in its developmental stages. Until then, the two-volume Russian-Kazakh dictionary published in 1978 by the Kazakh Council served as a primary reference for specialized terminology [29; 97].

## Research methods

Several dictionaries related to the field of information technology in the Kazakh language have been published to date. These include the two-volume Russian-Kazakh Dictionary published by the Editorial Board of the Kazakh Soviet Encyclopedia during the initial stages of computer terminology formation in Kazakh (edited by Musabayev G.G. and Sauranbayev N.T., 1978) [29]; “Russian-Kazakh Dictionary of Informatics and Computer Science Terms” by S.A. Aldashev and N.R. Akhmetov [30]; “Scientific Explanatory Dictionary in the Field of Informatics and Computer Science” [31]; “Dictionary of Computer Terms” by O. Aitbayuly and Zh. Bulanbayeva [32]; and the “Russian-Kazakh-English Dictionary of Informatics and Computing Technology Terms”, edited by Zh.S. Sarypbekov, B.Q. Shensizbayeva, S.G. Akhmetova, and Zh.B. Nalibayeva [33]. Additionally, as part of the “State Program for the Development and Use of Languages for 2011–2020”, the “Informatics and Computing Technology Dictionary” was included in the 30-volume “Kazakh-Russian, Russian-Kazakh Terminological Dictionaries” series [34]. The primary object of this research is the “Informatics and Computing Technology Dictionary”, published in 2014. This dictionary was chosen due to its status as the most recent publication and its substantial scope, containing a total of 10,060 terms. Among these terms, 1,188 are single-word entries, 6,141 are formed by combining two words, 2,197 by combining three words, and 534 by combining more than three words [35; 53]. The dictionary thus comprises a significant corpus of 22,197 words.

The first step in the study was to identify and select Latin and Greek words. A comparative-historical method was used to determine the Latin and Greek roots present in the dictionary. To identify the origins of all loanwords found in the dictionary, several resources were utilized, including the “Dictionary of Borrowed Words of the Kazakh Language” [36] and a range of online etymological dictionaries such as [37] [<https://www.etymonline.com/>], [38] [<https://lexicography.online/>], [39] [<https://dic.academic.ru/>], [40] [<https://kartaslov.ru/>], and [41] [<https://www.merriam-webster.com/>]. Once the Greek and Latin roots were identified, their frequency of occurrence within the dictionary was calculated using Microsoft Excel. This approach ensured a systematic and accurate analysis of the corpus.

## Results and discussion

The initial phase of our research has shown findings indicating the identification of 352 Latin root words and 165 Greek root words within the Kazakh Language's Information Technology terminology dictionary.

In order to illustrate the frequency of Latin-derived roots in Kazakh information technology terminology, we present word clouds (Fig. 1) generated using Google Colab. As shown in the figure, the most frequently occurring Latin-derived roots are «адрес» (address) (244 occurrences), «файл» (file) (195), «режим» (mode) (110), «код» (code) (142), «компьютер» (computer) (109), «функция» (function) (107), «процессор» (processor) (101), «регистр» (register) (90), «оператор» (operator) (64), and «машина» (machine) (70).



Figure 1. The frequency of usage of Latin-derived loanword roots

Among these, the roots functioning as prefixes in the Kazakh language include: bi+, de+, pre+, super+, inter+.

In Kazakh, the most frequently used Greek-derived loanword roots are as follows: «программа» (programme) (401 occurrences), «электр», «электрон» (electric, electron) (130), «автомат» (automatic) (146), «база» (base) (104), «логика» (logic) (102), «символ» (symbol) (124), «диск» (disk) (89), «тип» (type) (82), «параметр» (parameter) (78), «микро» (micro) (49), «графика» (graphics) (48), «синхрон» (synchronous) (40), and «техника» (technology) (37) (Fig. 2).

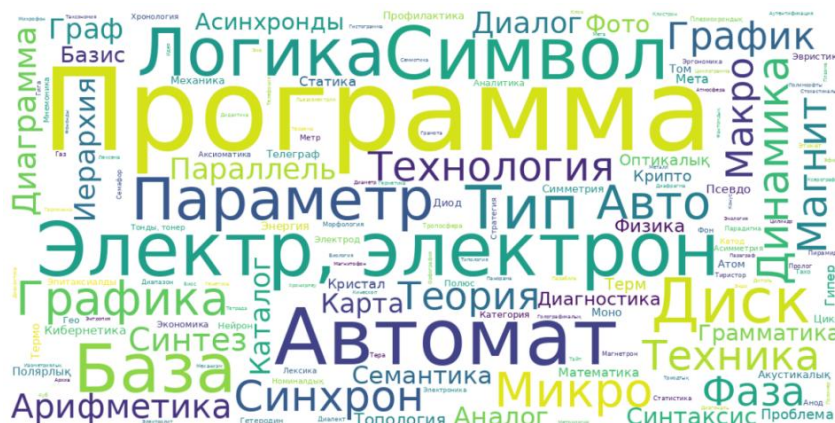


Figure 2. The frequency of usage of Greek-derived loanword roots

Among these roots, those functioning as prefixes in the Kazakh language include: авто+ (auto+), микро+ (micro+), биос+ (bios+), гео+ (geo+), гипер+ (hyper+), макро+ (macro+), мега+ (mega+), мета (meta)+, моно+ (mono+), тера+ (tera+), термо+ (thermo+), эндо+ (endo+).

The study systematically examined the frequency of usage for each of the identified Latin and Greek root words. The terminological dictionary of computer science and computer technology in Kazakh-Russian and Russian-Kazakh comprises 22,197 words. Our research findings indicate that the total absolute frequency of usage for 352 Latin-derived roots is 3,909. This indicates that Latin words constitute 17.6 % of the dictionary. A total of 165 Greek root words were identified, collectively demonstrating an absolute frequency of 2501 within the dictionary. Consequently, Greek language words constitute approximately 11.2 % of the overall dictionary composition (Diagram).

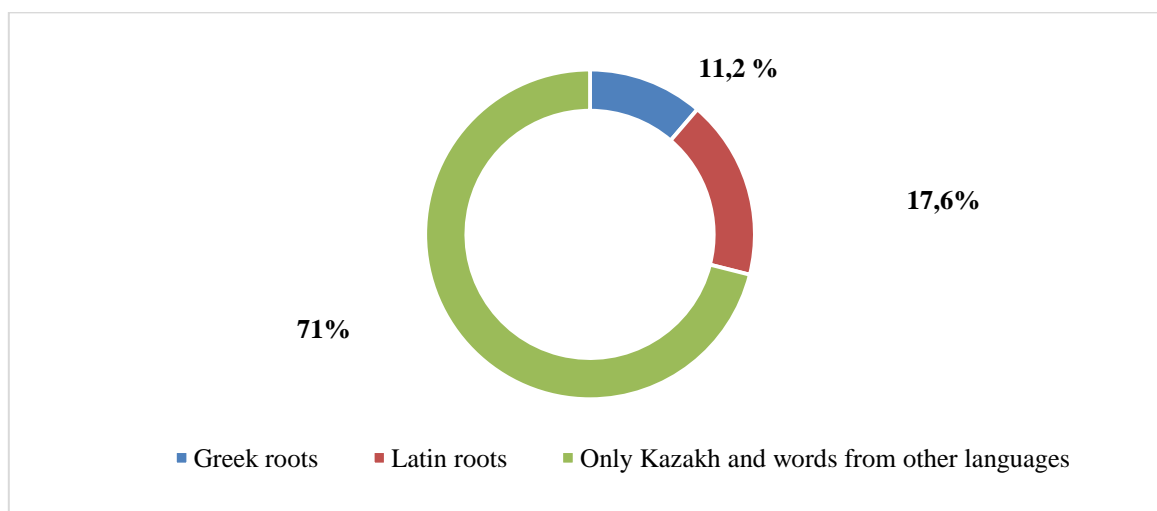
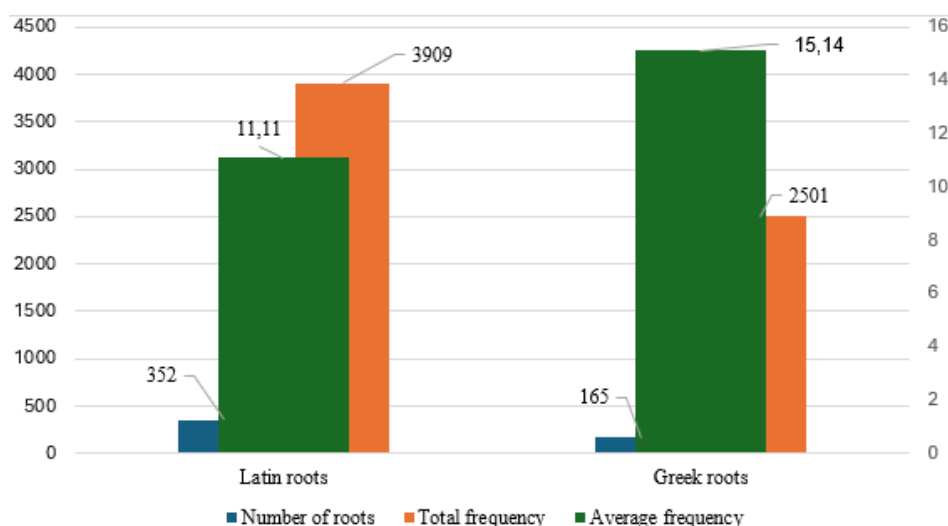


Diagram. Use of Greek and Latin roots in information technology terminology of the Kazakh language





Histogram. The comparative frequency of Latin and Greek roots in the lexicon

Latin roots appear significantly more frequently than Greek roots. The total frequency of Latin-derived roots is 3,909, whereas the frequency of Greek-derived roots is 2,501, indicating that Latin roots occur 54 % more frequently. This suggests that Latin roots appear approximately 1.54 times more often in the lexicon.

However, in terms of root productivity, despite the lower overall frequency, Greek roots exhibit a higher usage rate per unit. On average, each word containing a Greek root appears 15.1 times, whereas each word containing a Latin root appears 11.1 times. Consequently, regardless of their lower overall frequency in the lexicon, Greek roots are used 1.36 times more frequently than Latin roots. The higher usage frequency of words with Greek roots suggests their greater prevalence in terminology.

#### *Adaptation characteristics of Greek roots*

In the article, we examined the linguistic, lexical and phonological features of the introduction of Greek and Latin loanwords into the Kazakh language system. It should be noted that the words that entered the Kazakh language served as an intermediary between the Russian language and the Kazakh language. In the process of linguistic assimilation, the words that entered the Kazakh language from Greek underwent phonological changes, where the final sounds of the words -es, -us, -os, -s, -on and -o were eliminated.

For instance, «Автомат» (Automatic) in Kazakh is derived from the Russian «Автомат» (Automatic), which originates from the Greek “Automates” [37; 17]. Similarly, «Символ» (Symbol) in Kazakh comes from the Russian «Символ», (symbol) which can be traced back to the English “Symbol” and the Greek “Symbolon” [36; 453].

The sounds at the end of Greek words are omitted, and the sound +a is connected to the borrowing words. For instance, in the Kazakh language, the word «Дидактика» (didactics) is borrowed from the Russian language. In Russian, the word «Дидактика» (didactics) is derived from the Greek word “Didaktikos”, with the sounds +os removed and the sound +ик (a) added to the root “Didakt”. Greek words entered the Kazakh language according to this pattern:

Kaz. Профилактика <Rus. Профилактика <Gk. Prophylaktikos [36; 407].

Kaz. Гармоника <Rus. Гармоника <Gk. Harmonikos [36; 116].

Kaz. Генетика <Rus. Генетика <Gk. Genetikos [36; 120]

#### *Adaptation characteristics of Latin roots*

This section focuses on the specificities of borrowed words from the Latin language. During the borrowing process, the suffix +us was omitted from Latin words, and these words subsequently entered the Kazakh language through the Russian language. Additionally, certain Latin words came into Russian through intermediary languages such as French, German, and Italian. We illustrate some examples:

Kazakh word «Абсолют» is borrowed from Russian «Абсолют», ultimately derived from Latin “Absolutus” — meaning “absolute” [36; 14].

Kazakh word «Модуль» is borrowed from Russian «Модуль», which originates from German “Modul”, with its roots in Latin “modulus” — meaning “measure” [36; 329].

Kazakh word «Термин» is borrowed from Russian «Термин», which in turn comes from Polish “Termin”, ultimately derived from Latin “Terminus” — meaning “border mark” [36; 494].

Kazakh word «Утилита» is borrowed from Russian «Утилита», which has its origins in English “Utility”, ultimately derived from French “Utilite”, with its roots in Latin “Utilitas, utilis” — meaning “useful” [Etymonline: 9.12.2021] [37].

Furthermore, in the process of borrowing Russian the suffixes +ция adapts instead of suffixes such as +tionem, +um, +ium, +em are omitted. The Kazakh language also follows this model of borrowing.

For example:

Kazakh word «Индикация» is borrowed from Russian «Индикация», which in turn originates from English “Indication”, ultimately derived from Latin “Indicationem” [37]. (Etymonline: 31. 10. 2022).

Kazakh word «Коммерция» is borrowed from Russian «Коммерция», which traces back to English “Commerce”, with its roots in Latin “Commercium” [34; 242].

Kazakh word «Импликация» is borrowed from Russian «Импликация», which has its origins in English “Implication”, derived from Latin “Implicationem” [37]. (Etymonline: 2. 11. 2022).

Indeed, there are words in which the suffixes +um and +em are dropped when borrowed from Latin, entering the Kazakh language without the addition of any suffixes. Here are the examples provided:

Kazakh word «Эксперимент» is borrowed from Russian «Эксперимент», which traces back to German “Experiment”, ultimately derived from Latin “Experimentum” [36; 574].

Kazakh word «Субъект» is borrowed from Russian «Субъект», which has its origins in English “Subject” derived from Latin “Subjectum” [36; 476].

### Conclusion

The aim of the article was to determine the influence of Latin and Greek on information technology terminology. The study revealed that Latin and Greek words constitute a significant portion of the dictionary’s composition, with Latin words comprising approximately 17.6 % and Greek words around 11.2 %. The contribution of classical languages accounts for 29 %. This indicates that the international aspect is also considered in the creation of terms within information technology terminology. Moreover, it highlights the need to develop terms in the national language, specifically in Kazakh. It serves as clear evidence of the convergence of languages under the influence of globalization.

The linguistic characteristics of loanwords were thoroughly examined, shedding light on the assimilation process of Greek and Latin words into the Kazakh language. It was observed that these loanwords underwent phonological changes during their incorporation, including the omission or modification of certain terminal sounds. The borrowing patterns from the Russian language were evident in the evolution of these terms, with intermediary languages such as English, French, German, and Italian playing an influential role.

Like any research work, this study has its limitations. The first limitation is that the analysis focused exclusively on the information technology terminology dictionary rather than the full range of Kazakh branch-specific terminology dictionaries. The second limitation is that the study only examined loanwords with Latin and Greek origins, excluding borrowings from other languages. These limitations will be addressed in future research.

In conclusion, this study provides valuable insights into the dynamics of language development in Kazakhstan, particularly in the field of information technology. It underscores the significance of Latin and Greek root words and their adaptation within the Kazakh language. The findings contribute to a broader understanding of linguistic diversity and intercultural exchanges in the modern era. The comprehensive collection of Kazakh-Russian and Russian-Kazakh terminological dictionaries represents a vital resource for advancing language education and preserving cultural heritage in Kazakhstan. As languages continue to evolve and adapt, studies like this one play an essential role in documenting and appreciating the rich linguistic heritage of the Kazakh people.

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Б. Кеңес

### **Қазақ тіліндегі IT-терминологиясының дамуына латын және грек элементтерінің ықпалы**

Мақаланың мақсаты — қазақ тілінің IT-терминологиясына латын және грек тілдерінің ықпалын анықтау. Мақаланың міндеттеріне сәйкес кірме сөздердің теориясына шолу жасалды және грек-латын түбірлері анықталып, олардың сөздікте қолданылу жиілігі анықталды. Зерттеу жұмысында классикалық тілдердің басқа тілдермен байланысы және олардың ғылым тілін қалыптастырудағы маңызы зерделенді. Латын және грек кірме сөздерінің қазақ тіліне әсері, ену жолдары талқыланды. Зерттеудің материалы ретінде 10060 терминді қамтитын 2014 жылы жарық көрген «Информатика және есептеуіш техника» саласының сөздігі алынды. Мақалада грек және латын түбірлерін анықтау үшін салыстырмалы-тарихи әдіс қолданылды. Осы анықталған грек және латын түбірлерінің сөздікте кездесу жиілігін анықтау үшін Microsoft Excel бағдарламасы пайдаланылды. Зерттеу нәтижесінде 352 латын түбірі және 165 грек түбірі анықталды. Microsoft Excel бағдарламасымен латын түбірлерінің жиілігі — 3909 рет, грек түбірлері — 2501 рет сөздікте кездесетіндігі анықталды. Бұл латын түбірлерінің грек түбірлеріне қарағанда 54 %-ға жиі кездесетінін көрсетеді. Демек, латын түбірлері сөздікте шамамен 1,54 есе жиі қолданылады. Алайда түбір өнімділігі тұрғысынан алғанда, жалпы жиілігінің төмендігіне қарамастан, грек түбірлері бірлікке шаққандағы жоғарырақ қолдану деңгейін көрсетеді. Орташа алғанда, грек түбірі бар әрбір сөз 15,1 рет кездессе, латын түбірі бар әрбір сөз 11,1 рет кездеседі. Осылайша, сөздіктегі жалпы жиілігі төмен болғанына қарамастан, грек түбірлері латын түбірлеріне қарағанда 1,36 есе жиі қолданылатындығы анықталды. Грек түбірлері бар сөздердің жоғарырақ қолдану жиілігі олардың терминологияда кеңінен таралғанын көрсетеді. Мақаланың нәтижелері диаграммамен сипатталып көрсетілді. Сондай-ақ мақалада грек және латын тілінен енген сөздердің фонологиялық тұрғыдан қазақ тіліне бейімделуі сипатталды. Қорытындылай келгенде қазақ тілінің IT-терминологиясында латын түбірлері — 17,6 %, грек түбірлері — 11,2 %. Барлығы латын-грек сөздерінің үлесі — 29 %. Бұл IT-терминологиясы аясында термин жасауда халықаралық аспектінің де ескерілетінін көрсетеді. Оның үстіне қазақ тілінде термин жасатуды дамыту қажеттігі тұжырымдалады. Бұл дегеніміз — жаһандану әсерінен тілдер жақындасуының айқын дәлелі. IT-терминологиясының ағылшын тілінде қалыптасқандығы, қазақ тіліне грек-латын тілдерінің лексикалық жақындасуына ықпал етіп тұр. Сондай-ақ латын тілі өлі тілдердің қатарында болса да, әлі күнге дейін тірі тілдерге өз әсерін тигізуде.

*Кілт сөздер:* IT-терминология, латын түбірлері, грек түбірлері, кірме сөздер, абсолют жиілік.

Б. Кенес

## Влияние латинских и греческих элементов на развитие IT-терминологии в казахском языке

Целью статьи является определение влияния латинского и греческого языков на IT-терминологию казахского языка. В соответствии с поставленными задачами проведён обзор теории заимствованных слов, выявлены греко-латинские корни и определена их частотность в словаре. В исследовании рассмотрены связи классических языков с другими языками и их роль в формировании научной лексики. Проанализировано влияние латинских и греческих заимствований на казахский язык, а также пути их проникновения. В качестве материала исследования послужил словарь в области «Информатика и вычислительная техника», который был издан в 2014 году и содержит 10 060 терминов. С целью выявления греческих и латинских корней применялся сравнительно-исторический метод, а их частотность в словаре определялась с помощью программы Microsoft Excel. В результате исследования было выявлено 352 латинских и 165 греческих корней. Подсчёт с помощью Microsoft Excel показал, что греческие корни встречаются в словаре 2 501 раз, а латинские корни — 3 909 раз, это на 54 % больше, чем греческие. Следовательно, можно сделать вывод о том, что латинские корни употребляются примерно в 1,54 раза чаще, чем греческие. Однако с точки зрения продуктивности корней греческие заимствования демонстрируют более высокий уровень употребления. В среднем каждое слово с греческим корнем встречается 15,1 раза, тогда как слово с латинским корнем — 11,1 раза. Следовательно, несмотря на меньшую общую частотность, греческие корни употребляются в 1,36 раза чаще. Это свидетельствует об их распространённости в терминологии. Результаты исследования представлены в виде диаграмм, а также описаны фонологические адаптации греко-латинских заимствований в казахском языке. В целом доля латинских корней в IT-терминологии казахского языка составляет 17,6 %, греческих — 11,2 %, а общее количество латинско-греческих заимствований — 29 %. Это подчёркивает международный аспект терминологии и указывает на необходимость развития казахского терминоведения. Таким образом, можно наблюдать сближение языков под влиянием глобализации. Формирование IT-терминологии в английском языке способствует лексическому сближению казахского языка с греко-латинскими заимствованиями. Несмотря на то, что латинский язык считается мёртвым, он продолжает оказывать влияние на современные языки.

**Ключевые слова:** IT-терминология, латинские корни, греческие корни, заимствованные слова, абсолютная частота.

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