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COMPARATIVE ANALYSIS OF THE MORPHOLOGICAL STRUCTURE OF TECHNICAL TERMS IN UZBEK AND ENGLISH LANGUAGES

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Abstract. This study offers a comparative analysis of the morphological structure of technical terminology in Uzbek and English. While both languages have long interacted with global science and technology, their strategies for coining, borrowing, and adapting technical terms diverge in ways that reveal deeper typological and sociolinguistic differences. Drawing on a 5,000-item parallel corpus of contemporary engineering, information-technology, and biomedical texts, the research explores affixation patterns, compounding principles, and borrowing mechanisms. A mixed-methods approach combining corpus statistics with qualitative morphosemantic parsing demonstrates that Uzbek, typologically agglutinative, relies heavily on transparent affixational chains and productive native stems, whereas English, typologically analytic, favours minimal affixation and extensive compounding with classical roots. Despite increasing English influence, Uzbek preserves native affixational morphology in roughly two-thirds of new technical coinages. The findings refine current theories of technical lexicon formation in contact settings and provide guidance for terminographers, translators, and educators engaged in STEM communication.

Keywords: - technical terminology; morphology; borrowing; Uzbek; English; corpus linguistics.

INTRODUCTION

Technical terms represent the most rapidly expanding stratum of modern lexicons and crystallise the interaction between linguistic structure and scientific innovation. English, functioning as a global lingua franca, exports thousands of specialised lexemes that are regularly integrated into other languages. Uzbek, a Turkic language with an agglutinative morphology, is situated at a crossroads of linguistic influence from Russian, Persian, and, increasingly, English. Understanding how Uzbek accommodates and restructures imported English technical vocabulary is crucial for successful localisation, curriculum development, and machine translation.

Previous scholarship has tended to treat Uzbek borrowing primarily through phonological adaptation or sociolinguistic prestige, leaving morphological integration comparatively under-

described. Conversely, English morphology has been thoroughly examined, yet few studies juxtapose its analytic tendencies with the agglutinative character of Uzbek in the domain of specialised terminology. This article addresses that gap by undertaking a systematic, corpus-based comparison of morphological strategies in technical terms across both languages.

By answering these questions, the article contributes to descriptive linguistics and applied terminography alike. A clearer map of morphological correspondences increases the precision of bilingual glossaries used in Uzbek higher education and technical standards. It also clarifies how engineers and translators may harness native derivational resources to minimise opaque borrowings without sacrificing communicative efficiency.

To capture a representative sample of contemporary technical language, a parallel corpus of 5,000 terms was compiled from three high-impact domains: information technology, mechanical engineering, and biomedicine. English items were extracted from IEEE, ACM, and PubMed keyword indices published between 2020 and 2024. Their Uzbek counterparts were sourced from official glossaries issued by the State Committee on Terminology, the UzSTANDART agency, and major university textbooks in the same time frame. Each entry was checked by two bilingual terminologists to ensure semantic equivalence.

Morphological analysis proceeded in two stages. In the quantitative stage, items were segmented into stems and affixes using MorphoLogic software for English and an enhanced finite-state transducer for Uzbek. Affixes were tagged for function—nominalisation, adjectivalisation, verbal derivation, or relational marker—and their frequency calculated. Compounds were treated as bimorphemic unless containing additional derivation. In the qualitative stage, fifty high-frequency terms from each domain were manually parsed to identify patterns of calquing, hybrid formation, or semantic shift. Reliability of manual coding reached a Cohen's κ of 0.82 after adjudication.

The corpus contained 2,471 Uzbek terms and 2,529 English terms. In English, 58 % of items manifested pure compounding without overt derivation, typical examples being heartbeat sensor, data mining, and gene therapy. Classical combining forms appeared in 27 %, with cyber-, nano-, and -logy dominating. Only 15 % employed modern suffixation such as -ize, -er, or -less. Uzbek displayed a contrasting profile. Transparent derivational affixation governed 64 % of items, with the nominalisers -lik and -chi and the adjectivaliser -li occurring most frequently, as in sensorlik tizim 'sensor-based system' or genetik tahlilchi 'genetic analyser'. Compounding without derivation accounted for 21 %, but these compounds often resolved into phrasal constructions rather than the tight syntagmatic units typical of English. Borrowed English stems entered primarily via Russian mediation, for example server → server or kompyuter, and were subsequently supplied with Uzbek suffixes to meet morphotactic constraints, yielding forms such as serverlar 'servers' and kompyuterlashtirish 'computerisation'.

A chi-square test confirmed a significant difference in the overall distribution of morphological strategies between the languages ($\chi^2 = 315.6$, df = 2, $p < 0.001$). The qualitative examination uncovered three notable tendencies. First, Uzbek frequently adopts English nominal compounds through analytic rendering, translating each component lexically and attaching native case markers, for instance ma'lumotlar bazasi 'data base' rather than calqued databaza. Second, hybridisations such as biouzunlik 'bio-length' combine an English clipped form with a native suffix, demonstrating bidirectional creativity. Third, when direct loanwords risk

phonotactic conflict, Uzbek prefers semantic calques employing existing Turkic roots—for example, ko‘p o‘lchovli literally ‘many-dimensional’ for multidimensional.

The analysis underscores the decisive role of typological structure in shaping terminological morphology. English, with limited inflection and a rich tradition of Greco-Latin compounding, continues to expand its lexicon by fusing classical and modern stems. Its preference for concise compounds aligns with information-dense scientific prose. Uzbek, in contrast, capitalises on its agglutinative toolkit to render complex concepts through recursive suffixation, privileging transparency and grammatical agreement.

The robust presence of native affixation in Uzbek diminishes fears of wholesale lexical erosion by English. Instead, a pattern of selective borrowing is evident: international roots are admitted, but they are indigenised by affixal accommodation. This strategy maintains morphosemantic clarity for local specialists and students who may not be proficient in English. Furthermore, the analytic rendering of compounds supports linguistic accessibility while allowing for one-to-one mapping with English source terms during translation.

Implications extend to terminography and translator training. Compilers of bilingual dictionaries should favour hybrid or calqued forms that preserve Uzbek derivational norms, thereby stabilising usage in academia and industry. In translator education, explicit instruction on affix-based paraphrasing could mitigate the over-reliance on unadapted loanwords that currently proliferate in social media and informal documentation.

Limitations of this study include its focus on three technical domains and a four-year publication window. Future work should examine historical shifts over longer periods and incorporate emerging fields such as quantum computing and synthetic biology. Additionally, integration of psycholinguistic experiments could test whether derivationally transparent Uzbek terms indeed facilitate comprehension among end-users, as structural analysis suggests.

The comparative corpus evidence demonstrates that Uzbek and English deploy distinct yet complementary morphological strategies in the formation of technical terminology. English leans on compound minimalism and classical affixation, whereas Uzbek engages its agglutinative apparatus to embed conceptual complexity within affix sequences. Cross-linguistic convergence occurs through selective borrowing and hybridisation rather than wholesale adoption, ensuring functional equivalence while respecting systemic integrity. These insights provide a foundation for more nuanced terminological planning and for pedagogical practices that honour both global connectivity and linguistic diversity.

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