CORE UNITS OF COMPUTER LEXIS

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Summary

This paper analyzes the core vocabulary of English computer lexis, examining the criteria for identifying central terms and describing their structure and characteristics. The core units represent the most relevant concepts in computer terminology, characterized by high frequency, ambiguity, stylistic neutrality and significant word-formation potential. The study distinguishes "first-level core units" like "user", "computer" and "internet" that denote the most important notions; "second-level core units" like "smart" and "digital" that originated as synonyms but became independent; and "core elements" like cyber, tele and e- that started as abbreviations. Core units generate numerous morphological and syntactic innovations, often expanding or narrowing in meaning. The core lexeme "electronic" is especially productive, forming phrases representing computer trends and systems. Core elements undergo lexicalization into independent prefixes and word-forming components. While artificial intelligence is currently popular, related linguistic innovation remains limited. The core vocabulary has a complex structure with central concepts spawning many new terms through derivation and compounding. The paper examines the phenomena of synonymous attraction, functional homonymy in core elements, and the dualistic nature of computer lexis development. It provides a systematic analysis of the core English computer terminology and its word-formation capabilities.

Key words: computer terminology, core vocabulary, word formation, neologisms, lexicalization, abbreviations, linguistic innovation.

1. Introduction

The distinction between the core and peripheral vocabulary is an important stage in the development of the computer lexis because this division indicates the formation of its complex structure. Establishing the criteria for distinguishing the core vocabulary of computer lexis, its structure, and describing the main core units is the purpose of our study.

Its novelty lies in the application of modern research methods and theories in analyzing the core vocabulary of the modern computer lexis of the English language, and in studying the peculiarities of "computer-marked" units that are part of it. The practical basis of the study was the materials of websites devoted to registering and studying English-language innovations – namely, the Cambridge Dictionary website, as well as Wordspy.com.

According to the researchers, the issue of defining the main criteria for identifying the core units of a language remains controversial. There are different concepts of solving this issue within different scientific approaches: structural (O.O. Zalevska), semantic (G.I. Kustova, J. Aitchison, A. Wierzbicka), communicative (A.E. Levitsky, M. Modiano, R. Quirk, G. Stein), psycholinguistic (V.M. Manakin, L. Kushmar), and others *(Halutskykh, 2007: 3; Kushmar, 2019: 165)*.

There is also no unanimity among scholars who study core vocabulary and define the criteria for its selection. For example, D. Crystal and N. Vyshyvana define frequency as one of these criteria *(Crystal, 2004; Vyshyvana, 2023),* D. Terekhova and L. Kushmar add the criteria of informativeness, R.Carter and M.Stubbs – polysemantics and stylistic neutrality, V.V. Vakhmistrov, E.M. Galkina-Fedoruk – breadth of compatibility *(Halutskykh, 2007, Kushmar, 2019).*

In our opinion, the core and periphery of the lexis, as well as the belonging of certain lexical items to the core or periphery, should be considered from the point of view of communicative relevance. According to this concept, the core of the linguistic system is recognized as the words that are most relevant and important for communicators. However, the other criteria mentioned above are important markers of the belonging of certain units to the core vocabulary, and they narrow the framework that helps to classify these units as core proper.

As the researchers note: "In the course of evolution, a language accumulates lexical units that have a set of properties – morphological simplicity, developed polysemy, predominantly nominative character, stylistic neutrality, high frequency, wide range of synonymous relations, high word-formation potential – that ensure their chronological stability, as well as the functional, structural, and evolutionary centrality of the core vocabulary" *(Halutskykh, 2007: 5).* Other scholars state that "…core units are defined by the highest degree of generalization, while the units located on the periphery specify the features contained in the nuclear units, that is, they are characterized by greater specificity of meaning" *(Maksymenko, 2012: 346).*

Studying the computer lexis, we see that most of the above points about the characteristics of core lexical units are confirmed in it. It turned out that "computer-marked" core lexemes are characterized by ambiguity, stylistic neutrality, high frequency, and the ability to form a significant number of derivatives. Also, from a functional and structural point of view, core lexemes of the computer lexis are the centers of synonymous attraction and have the largest number of synonyms.

We distinguish three main types of core units. The first type includes actual core words, which we call "first-level core units", the most relevant and important computer concepts. The second type includes so-called "core elements", i.e. core units represented in the lexis in a reduced, abbreviated form. The third type includes "second-level core units", i.e. units that, having been initially actualized in the computer lexis as synonyms for "first-level core units", have gradually acquired the qualities of real core lexemes.

2. First-level core units

According to our research, the "first-level core units" of the computer lexis are such essential and relevant words as "user", "computer", "internet", "programming", "software" and "electronic". They serve as centers of synonymic attraction, which, being stylistically neutral in themselves, contribute to the emergence of a large number of stylistically marked synonyms. The largest number of synonyms (95) was created for the concept of "user", which indicates that computer users are actively striving for self-identification within the virtual space. Stylistically, most of the synonyms belong to professionalisms and professional jargon.

When studying the word-formation potential of the core units of the computer lexis, it should be noted that quite often their word-formation paradigm is realized both at the morphological and syntactic levels, leading to the emergence of both new words and innovative phrases. For example, the core unit **internet** has caused the emergence of such new words as: Internet2, internetworking, InterNIC, Internetese, splinternet, internot, and others.

At the same time, this lexeme is used to form numerous phrases, including the most common ones: Internet account, Internet backbone, Internet billboards, Internet era, Internet Explorer, Internet security, Internet Society, Internet telephony, Internet time, Internet Death Penalty, Chief Internet Evangelist, Chief Internet Officer, the Internet of Behavior, the internet of senses, the internet of me, the internet of everything, which characterize not only computer processes but also some quite extranet realities:

*Currently, consumers online are restricted by technology that focuses on only two senses, sight and sound. However, all of this is expected to change with the emerging internet of senses … **The internet of senses** creates a network of sensory events, and is expected to make a multi-sensory experience in the digital realm possible. (Kristina Naumovski, "**The Internet of Senses** and the Future of E-commerce", Future of Marketing Institute, May 9, 2021).*

Naturally, the core unit **computer**, meaning "related to computers and the Internet", plays a significant role in computer innovation processes; it is used to create numerous lexical innovations both at the level of words and phrases: Compu$erve, compunications, nanocomputer, computron affective computing, zombie computer, parasitic computing, computer confetti, stand-alone computer, computer doping, computer vision syndrome, ambient computing, ubiquitous computing, sky computing, and many others:

Sky computing has been described as "the layer above the clouds." The term refers to a newer model of cloud computing known as multi-cloud, where organizations may pick and choose different cloud services from different operators according to their specific requirements. (Dan Irascu, "What's next after cloud computing?", TechBehemoths.com, July 20, 2022).

The core unit **electronic** deserves special attention, as it shows considerable innovative activity. It is used to form numerous phrases denoting trends in computer development and the state of computer technology and types of computer systems. The innovations characterizing the types of computer systems include such phrases as electronic shopping, electronic banking, electronic cash, electronic money, electronic purse, electronic cottage, electronic trade, electronic nose, electronic paper, electronic ink, etc.:

*A recent tweet from Apple analyst Ming-Chi Kuo will have e-reader competitors sweating as he hinted at the fact that Apple is taking a close interest in **electronic ink** screens. ("Apple hints at move to **electronic ink** screens", The Brussels Times, May 21, 2022).*

The importance and uniqueness of the core unit **electronic** lies in the fact that it has created a synonymous series of lexemes such as smart, cyber, tele, info, dotcom, digital, silicon, virtual, and e-, which eventually became independent "second-level core units" capable of productive word formation. Moreover, such units as cyber, tele, info, and e- are abbreviations of cybernetic, telecommunication, information, and electronic, which function mainly in their abbreviated, reduced form. These lexical items, according to our classification, are "core elements".

3. Second-level core units

The core unit **smart** – in its new meaning "related to modern technologies" – has become the basis for the formation of numerous phraseological phrases: smart card "a credit or debit card with a memory unit that records transactions"; smart house "a house equipped with an electronic system for controlling heating, electricity, etc."; smartphone "a phone performing many of the functions of a computer"; smart dust "miniature lightweight mechanisms containing sensors and communication devices", smart desk "computerized desk that can be raised for use while standing and can monitor the user's movements, time spent at the desk sitting or

standing, and calories burnt", smart city "a city where information and communications technology is used to make life better for its residents", and others.

In modern texts, you can also find numerous compounds with the core lexeme **virtual** ("related to computer technology, to the Internet"): virtual ad, virtual cash, virtual executive, virtual Friday, virtual visitation, virtual water, virtual advertising, virtual manager, virtual being, virtual commute, and so on:

*If there's one thing remote workers probably don't miss about going into the office, it's the commute. Microsoft, however, disagrees. The company announced that it is working on a new feature for its Teams platform that will allow remote workers to schedule **virtual commutes**. The idea is to help give workers a solid separation between work and home, a time before and after work each day where they can reflect and set goals without work or home getting in the way. ("What is a **virtual commute**?" Government Technology, September 30, 2020).*

The word **digital** began to be used in the 80s in the sense of "computerized" and became the center of "digital" phrase formation in the 90s and early 21st century: digital video, digital audio tape, digital videodisc, digital terrorism, and digital media. At the turn of the century, the lexeme digital underwent an expansion of its meaning to mean "connected to the World Wide Web". It became the breeding ground for the phrases like: digital cash, digital economy, digital mall, digital pathogen, digital certificate, digital entertainment, digital footprint, digital jewelry, digital lifestyle, digital revolution, digital signature, digital divide, digital republic, digital amnesia, digital campfire, digital nutrition, digital vellum, digital notepad, digital twin, digital divorce, digital diet, digital removalist, and others:

*Social media, viral posts, and the complexity of the Internet make it difficult to delete embarrassing public and private moments that make their way online. Jon Brodsky, a manager at finder.com, says Generation Z is growing up without the awareness of the consequences that can come from a regretful digital footprint. "As this generation starts to enter the workforce, **digital removalists** will be in high demand to erase anything incriminating that could impact their future opportunities." (Noelia Trujillo, "15 cool jobs you could have in the future", Reader's Digest New Zealand, December 2, 2022).*

We also see examples of the abbreviation of digital and the emergence of such neologisms as diginecker (digital + rubbernecker) – a person who readily takes photos and videos if they witness an accident, phygital (physical + digital) – integrated communications combining digital and physical spaces that provide the consumer with a new experience, and digi-dog – a dog trained by the police to use its sense of smell to find digital devices that have been used by criminals:

*Whether it's a Sim card from a drug gang's burner phone, a key fob for a getaway car, a terrorist's mobile phone [or] a laptop in a fraud case … Jake and his fellow "**digi-dogs**" can sniff it out. "On every digital storage device there is a chemical that has a very specific scent," explains the instructor, one of three dog handlers who have been spearheading the Met's **digi-dog** training scheme. (James Palmer, "How a new squad of elite sniffer dogs is catching cybercriminals", The Times, December 12, 2021).*

The unit **silicon**, meaning "the world of computer technology, the electronic industry," has become the basis for creating innovations to designate the centers of the computer industry – Silicon Valley, Silicon Bog, Silicon Glen, Silicon Fen, Cwm Silicon, Silicon Island, Silicon Plateau, Silicon Polder, Silicon Wadi, Silicon Albion, Silicon Gorge, Silicon Slopes:

*Some have taken it as a signal that the days of high growth in **Silicon Slopes** are behind us, but Utah's job numbers seem to disagree. (Tilda Wilson, "2023's high-profile **Silicon Slopes** layoffs portend slower growth, not disaster", Kuer.org, December 28, 2023).*

4. Core elements

Called to life by the digital revolution, core elements display considerable productivity, producing dozens of neologisms. For example, innovations with the core element **info** include: infosphere "the industry related to the processing and distribution of information", infomania "passion for modern information technology, for the accumulation of information", infotech "modern information technology and technology", infocentre "an information center that provides information to tourists", infoslave "a person in a company who serves several departments by setting up the software in these departments", infobesity (info + obesity) "a state of having access to so much information that it leads to difficulties with decision-making, concentration and understanding", infodemic "a very large amount of information that is published about a particular problem, some of which is untrue, therefore making it more difficult to find a solution", infostealer "a type of computer software that has been deliberately designed to steal information such as passwords, bank account details", etc.:

*There's a wide range of data that cybercriminals aim to access through the use of **infostealers**. Most notably, payment card details and login credentials are highly valuable. A criminal could either directly use this data to their advantage or sell it on a dark web marketplace to other malicious actors. (Katie Rees, "What Is an **Infostealer**? Is It Dangerous?", MakeUseOf.Com, October 30, 2022).*

Another core element that has proved fruitful for morphological and syntactic word formation is the element **cyber**, which was originally a contraction of the word cybernetic, but later acquired an independent meaning: "related to information technology, computers, and the Internet". In this sense, this element is present in the following words and phrases: cyber-Monday, cyber noir, cyber sit-in, cyber sitters, cyber-attack, cyber-cafe, cyber-fraud, cyber mercenary, cyber ambassador, cybersex, cyberslang, cyberspace, cyberwar, cyberdefender, cybersoldier, cyberflashing, cyberhoarding, cyberloafing, and others. In this case, there is a manifestation of the so-called "functional homonymy", i.e. the functioning of the element **cyber** in the sense of both a word-forming affix and a phrase-forming element, which indicates the dualistic nature of the development of the computer lexis:

*Rajeshwari is one among thousands of students from the south Indian state of Telangana who are being trained to become "**cyber ambassadors**" in the region. Over 3,000 students graduated from the first class of **cyber ambassadors** last year. And following the success of the first batch, the Telangana government—which is perhaps the first state in India to have come up with a novel concept like this—has started the second batch of the course with almost 10,000 students. (Varsha Bansal, "In the Fight Against Scams, '**Cyber Ambassadors'** Enter the Chat", Wired.com, January 13, 2023).*

Core element **tele**, which has undergone a narrowing of its semantics and in the examples below has the meaning "related to telecommunications technology," proved to be productive in the creation of "electronic" lexical items usually related to the computerized remote services: teleshopping "ordering and purchasing goods by phone and computer", telebanking "a computerized system for managing a depositor's bank account", telebroking "computerized brokerage operations", telecottage "a special room, especially in rural areas, equipped with computers and telecommunications", teletherapy "the treatment of mental illness by discussing someone's problems with them using videoconferencing rather than in person":

*The transition to **teletherapy** has been more of a tidal wave than a trickle, with therapists, who generally prefer person-to-person interaction, saying that it's a safer way to serve their clients. (Nara Shoenberg, "Chicago therapists are switching to **teletherapy** to see stressed-out patients during coronavirus pandemic", Chicago Tribune, April 7, 2020).*

The element **e-**, which originated from the word e-mail and was originally considered a convenient abbreviation of the word electronic, is now considered a new prefix or a combination form synonymous with the prefix cyber-. The rather broad word-formation semantics, the core of which is the seme "related to the Internet and telecommunications technology," gives this element the possibility of forming numerous prefix and blending innovations: e-envoy, e-minister, e-trade, e-shopping, e-junkmailer, e-scoop, e-lancer (e + freelancer), e-tail (electronic + retail), e-economy (electronic + economy), e-cubator (e + incubator), e-reader, e-waste, e-skin, etc.:

*Discarded electronics, known as **e-waste**, often contain large amounts of gold and other heavy metals. Scientists have come up with methods to recover the valuable metals, but these processes often rely on synthetic chemicals that can damage the environment. (Alex Wilkins, "Old milk can be used to extract gold and other metals from **e-waste**", New Scientist, February 9, 2024).*

Despite the great popularity of the topic of using artificial intelligence (AI) in recent years, we have not yet witnessed a significant increase in the number of language units related to it. There are a few neologisms based on the abbreviation AI, words and phrases such as chat, chatbot, deep learning, and machine learning, but the total number of such units is fewer than a dozen.

5. Conclusions

The core vocabulary of the computer lexis includes the most relevant, important, and widely used words that have high frequency, ambiguity, stylistic neutrality, synonymous attraction, and significant word-formation potential, producing many new words and phrases that often narrow or expand their meanings. The core vocabulary of computer lexis is divided into "first-level core units", "second-level core units", and "core elements".

Core units are productive centers of word formation, they produce a significant number of morphological and syntactic innovations with narrowing and expanding their meaning. There is also a phenomenon of functional homonymy – lexicalization and transformation of core word-forming elements into bifunctional units.

The study shows the core vocabulary of computer lexis has complex structure and relationships, with central concepts generating many new related terms through derivation and compounding.

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