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Е.Г. Гериева, В.А. Игнатенко, Е.Л. Хохлова, Е.Б. Храмова

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Рецензенты:

Алипичев А.Ю., канд. пед. наук, доцент кафедры иностранных и русского языков (ФГБОУ ВО РГАУ-МСХА имени К.А. Тимирязева);

Николаева Т.Н., канд. филол. наук, ст. преподаватель отделения англоязычной межкультурной коммуникации Департамента языковой подготовки ОАФ, Российская академия народного хозяйства и государственной службы при Президенте РФ

И 25 Гериева Е.Г., Игнатенко В.А., Хохлова Е.Л., Храмова Е.Б.

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Цель пособия – формирование и отработка у обучающихся навыков чтения и анализа аутентичных текстов по направлению «Информационные технологии», развитие у студентов устойчивой системы речевых компетенций для профессионально-ориентированного общения на английском языке.

Учебное пособие рассчитано на 32 часа аудиторной работы. Каждый урок включает аутентичный текст по направлению, словарь с транскрипцией, вопросы для проверки понимания прочитанного и цикл упражнений на закрепление материала. Особое внимание отводится отработке навыков монологической и диалогической речи с целью закрепления пройденного лексического минимума.

В издании, подготовленном в соответствии с Федеральным образовательным стандартом, учтены особенности преподавания иностранного языка в неязыковых вузах. Пособие может быть использовано в качестве основного для групп с уровнем владения языком В1-В2.

Для бакалавров, обучающихся по ФГОС ВО по направлениям подготовки 09.03.02 «Информационные системы и технологии», 09.03.03 «Прикладная информатика».

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The purpose of the manual is to form and improve students' reading and analytical skills of original texts about information technology, develop a stable system of speech competence.

The publication, prepared in accordance with the Federal State Educational Standard, considers the peculiarities of teaching a foreign language in non-linguistic universities.

It is intended for bachelor students studying under the Federal State Educational Standard in the fields of study 09.03.02 “Information systems and technologies”, 09.03.03 “Applied computer science”.

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ВВЕДЕНИЕ

Данное учебное пособие по дисциплине «Иностранный язык» предназначено для работы на занятиях с бакалаврами, обучающимися по направлениям подготовки 09.03.02 «Информационные системы и технологии», 09.03.03 «Прикладная информатика».

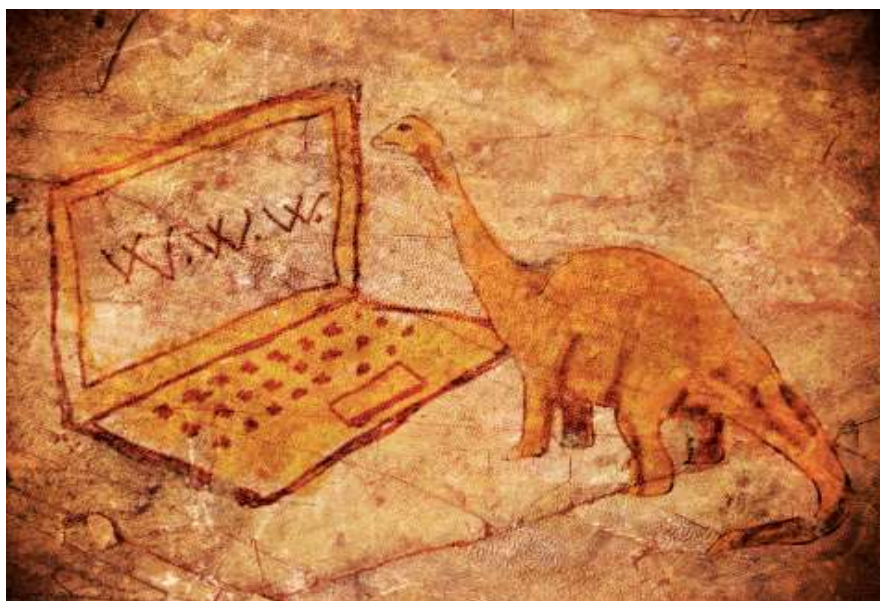
Цель данного пособия – формирование у обучающихся навыков чтения и анализа аутентичных специализированных текстов на английском языке для извлечения необходимой информации и активизации лексического минимума, представленного в словаре, что, в свою очередь, позволит развить базовую систему речевых компетенций для дальнейшей эффективной профессиональной коммуникации.

Пособие состоит из 8 тематических разделов, каждый из которых имеет следующую структуру:

- 1) аутентичные тексты, специализированной направленности;
- 2) необходимый лексический минимум;
- 3) тренировочные лексические упражнения;
- 4) речевые упражнения, направленные на отработку монологической и диалогической речи студентов в рамках профессионального общения;
- 5) фотографии, схемы и таблицы для обеспечения наглядности процесса изучения иностранного языка.

Представленный языковой материал, широкий диапазон лексических и коммуникативных упражнений направлены на отработку ключевых навыков работы с текстом, его анализа и закрепления необходимого словарного минимума, что, в свою очередь, позволяет вывести процессы профессиональной коммуникации будущих специалистов IT сферы на качественно новый уровень и сформировать актуальный лексический запас.

UNIT 1. THE HISTORY OF COMPUTING



➤ LEAD-IN

Answer the questions:

1. Think of one machine or invention from the history of computing (for example: abacus, mechanical calculator, ENIAC, transistor, microprocessor). Which one do you think had the biggest impact on society and why?
2. What were the main differences (consider size, speed, power consumption and how they were programmed) between early computers (1940s–1950s) and today's personal computers?
3. How did the invention of the microprocessor and the internet change the role of IT professionals?

➤ READING

Read and translate the text

THE HISTORY OF COMPUTING

Long before silicon chips and glowing screens, people solved complex problems with fingers, gears, rods, and careful procedures. The era before electronic

computers is rich with ingenious tools and disciplined thinking. It starts with simple tools for counting and ends with powerful devices and networks that connect the world. In this text, we will look at the main steps in the development of computing, important people, and how these changes affected technology and society.

Counting and mechanical devices

Before electronic computers existed, people used simple tools to help with calculations. The abacus, invented thousands of years ago allowed merchants and traders to add and subtract quickly. In the seventeenth century, mathematicians and inventors created mechanical calculating machines. One famous example is Blaise Pascal's mechanical calculator, which could add and subtract gears. Later, Gottfried Wilhelm Leibniz improved the design and built a machine that could multiply and divide. These inventions showed that machines perform mathematical tasks automatically.

The idea of programmable machines

In the nineteenth century, the concept of a programmable machine appeared. Charles Babbage, an English mathematician, designed the Difference Engine and the more advanced Analytical Engine. Although Babbage never completed a working Analytical Engine, his ideas were crucial. The Analytical Engine had components similar to modern computers: a central processing unit (called the "mill"), memory (called the "store"), and input/output mechanisms. Ada Lovelace, who worked with Babbage, wrote notes that described how the machine could follow a sequence of operations. Many people consider her the first computer programmer because she described an algorithm for the machine.

Electromechanical and early electronic computers

The twentieth century brought new energy to computing. During and after World War II, engineers and scientists developed large electromechanical and electronic machines. One of the earliest electronic computers was the ENIAC (Electronic Numerical Integrator and Computer), completed in 1945 in the United States. ENIAC used vacuum tubes and could perform many calculations much faster than previous machines. Around the same time, other important projects were

happening in Britain and Germany. Alan Turing, a British mathematician, proposed the idea of a universal computing machine in the 1930s. He influenced later designs and the theory of computation.

Stored-program concept and architecture

A major breakthrough was the stored-program concept. Proposed by John Neumann and others, this idea meant that a computer could store data and instructions in memory. The first designs based on this idea led to faster and more flexible machines. Von Neumann architecture is a computer design where instructions and data are stored in the same memory space. This means the CPU (Central Processing Unit) fetches both instructions and data from the same memory, using the same pathways. It separates the central processing unit, memory, and input/output, became the standard for many computers. This architecture made it easier to write software and to build more complex systems.

From vacuum tubes to transistors and integrated circuits

Early electronic computers used vacuum tubes, which were large, hot, and unreliable. In 1947, scientists at Bell Labs invented the transistor. Transistors were smaller, faster, and more reliable than vacuum tubes. This invention led to smaller and more powerful computers. Later, in the late 1950s and 1960s, engineers developed integrated circuits, which put many transistors on a single chip. Integrated circuits made computers even smaller and cheaper. These advances allowed the development of personal computers and many other electronic devices.

The rise of software and programming languages

As hardware improved, software became more important. In the 1950s and 1960s, programmers developed higher-level programming languages like Fortran, COBOL, and LISP. These languages made it easier to write complex programs without dealing directly with machine code. Over time, many new languages appeared to meet different needs: systems programming, web development, scientific computing, and more. Software engineering also became a formal discipline, with methods for designing, testing, and maintaining programs.

Personal computers and the Internet

In the 1970s and 1980s, personal computers (PCs) changed computing again. Small companies and hobbyists built microcomputers using microprocessors like the Intel 8080 and 6502. Companies such as Apple, Microsoft, and IBM played a big role in bringing personal computers to homes and businesses. Graphical user interfaces (GUIs), popularized by systems like the Macintosh and later Windows, made computers more accessible to non-technical users.

At the same time, the Internet started as a research network and then grew into a global system. The creation of the World Wide Web by Tim Berners-Lee in 1989 made it easier to access information and share documents across networks. The Internet and the web changed how we communicate, work, and learn. They also created new industries, such as e-commerce, online media, and cloud computing.

Mobile computing and modern trends

In the twenty-first century, mobile devices and smartphones made computing personal and portable. Powerful chips, wireless networks, and app ecosystems allowed people to perform many tasks on small devices. At the same time, developments in artificial intelligence, machine learning, and big data are changing what computers can do. Cloud computing provides scalable resources for storage and processing, and it supports services used by millions of people.

Impact on society and the future

The history of computing shows steady progress from simple tools to complex systems that affect every part of life. Computers improved science, industry, education, and entertainment. They also raised new questions about privacy, security, and ethics. As computing continues to develop, people must think about how to use technology responsibly and how to teach new generations of developers and users.

The history of computing is a story of ideas, inventions, and people who wanted to make calculations easier and to solve new problems. From the abacus to cloud services, each step built on previous knowledge. For IT students, knowing this history helps to understand modern systems and to imagine future innovations. The discipline continues to change rapidly, and studying its past gives useful perspective for work and learning in the future.

➤ VOCABULARY

1. silicon chips [ˈsɪlɪkən tʃɪps]	кремниевые микрочипы, кремниевые чипы
2. glowing screens [ˈɡloʊɪŋ skri:nz]	светящиеся экраны
3. ingenious [ɪnˈdʒiːniəs]	изобретательный, искусный, оригинальный
4. abacus [ˈæbəkəs]	Счёты
5. mechanical calculating machine [məˈkænikəl ˈkælkjuleɪtɪŋ məˈʃiːn]	механическое вычислительное устройство
6. to add and subtract gears [tuː æd ənd səbˈtrækt ɡɪəz]	складывать и вычитать шестерни
7. to multiply and divide [tuː ˈmʌltɪplaɪ ənd dɪˈvaɪd]	умножать и делить
8. algorithm [ˈælgəˌrɪðəm]	Алгоритм
9. programmable [ˈproʊɡræməbl]	программируемый
10. Difference Engine [ˈdɪfrəns ˈendʒɪn]	разностная машина (Difference Engine Бэббиджа)
11. Analytical Engine [ˌænəˈlɪtɪkəl ˈendʒɪn]	Аналитическая машина (Analytical Engine Бэббиджа)
12. transistor [trænˈzɪstər]	Транзистор
13. vacuum tube [ˈvækjuːm tuːb]	вакуумная лампа (электронная лампа)
14. integrated circuit [ˈɪntɪɡreɪtɪd ˈsɜːrkt]	интегральная схема
15. central processing unit [ˌsentrəl ˈproʊsesɪŋ ˈjuːnɪt]	центральный процессор
16. CPU [ˌsiː piː ˈjuː]	ЦП (центральный процессор)
17. sequence [ˈsiːkwəns]	последовательность
18. Electronic Numerical Integrator and Computer [ɪlekˈtrɒnɪk njuːˈmerɪkəl ˈɪntɪɡreɪtər ənd kəmˈpjʊːtər]	электронная цифровая вычислительная машина
19. ENIAC [ˈɛniæk]	электронная цифровая вычислительная машина
20. to perform calculations [tuː pərˈfɔːm kælkjʊˈleɪʃənz]	выполнять расчеты
21. stored-program concept [stɔːdˈproʊɡræm ˈkɒnˌsept]	концепция хранимой программы

22. to fetch [tu: fetʃ]	Получать
23. accessible [ək'sesəbl]	Доступный
24. cloud computing [klaʊd kəm'pju:tɪŋ]	облачные вычисления
25. scalable ['skeɪləbəl]	масштабируемый

➤ COMPREHENSION CHECK

Exercise 1. Put these events from the text in chronological order (earliest → latest):

- Creation of the World Wide Web by Tim Berners-Lee
- Invention of the transistor at Bell Labs
- Development of ENIAC
- Design of the Analytical Engine by Charles Babbage
- Appearance of personal computers and microprocessors (Intel 8080, 6502)
- Invention of the abacus

Exercise 2. Continue the statements below using the text “The History of Computing”.

1. Long before electronic computers, people relied on mechanical tools like

2. The development of programmable machines in the 19th century, such as

3. The 20th century saw the rise of

4. The invention of the transistor and integrated circuits made computers

5. Understanding the evolution of computing helps us appreciate

Exercise 3. Answer the following questions based on the text:

1. Who invented the mechanical calculator in the seventeenth century, and what could it do?

2. How did Blaise Pascal and Gottfried Wilhelm Leibniz contribute to the development of early calculating machines?

3. What was the significance of Charles Babbage's Analytical Engine?

4. What is the stored-program concept, and how did it revolutionize computer architecture?

5. How did the invention of transistors and integrated circuits impact the size and power of computers?

6. Why did high-level programming languages like Fortran and COBOL become important in the evolution of software?

7. How did personal computers and the Internet change the way people use technology and communicate?

8. What are some modern trends in computing? Do they influence society and future developments much? Why?

Exercise 4. Summarize the text in 8 – 10 sentences using your answers in exercise 3 as guidelines.

➤ VOCABULARY EXERCISES

Exercise 1. Fill in the blanks with the best word from the bank:

WORD BANK:

*trends, World Wide Web, programming, transistor, electronic, programmer,
computers, machine, gears, tools*

1. Before electronic computers, people used simple _____ like the abacus to perform calculations.
2. Blaise Pascal's mechanical calculator could add and subtract using _____.
3. The _____ designed by Gottfried Wilhelm Leibniz could multiply and divide.
4. Charles Babbage's Analytical Engine had components similar to modern _____: the "mill" and the "store".
5. Ada Lovelace is considered the first computer _____ because she described an algorithm for the machine.
6. The ENIAC was one of the earliest _____ computers, built in 1945.
7. The invention of the _____ at Bell Labs in 1947 made computers smaller and more reliable.
8. High-level _____ languages like Fortran and COBOL made it easier to write complex software.
9. The creation of the _____ by Tim Berners-Lee in 1989 revolutionized information sharing.
10. Modern _____ in computing include mobile devices, artificial intelligence, and cloud services.

Exercise 2. Unscramble the word *in italics* in the following sentences. Write the correct word in parentheses.

1. Long before silicon chips and *iglwgon* screens, people solved complex problems with fingers, gears, rods, and careful procedures. (_____)
2. The *auacbs*, invented thousands of years ago allowed merchants and traders to add and subtract quickly. (_____)

3. Gottfried Wilhelm Leibniz improved the design of calculators to perform **umltipiliactino** and division. (_____)
4. Charles Babbage, an English mathematician, designed the **Drfffeiecne** Engine and the more advanced Analytical Engine. (_____)
5. During and after World War II, engineers and scientists developed large electromechanical and electronic **smeancih**. (_____)
6. The ENIAC, completed in 1945, was an early electronic computer that used **vmuacu** tubes. (_____)
7. In the 1970s and 1980s, personal computers (PCs) changed **icmputngo** again. (_____)
8. High-level **gnimmargorp** languages like Fortran and COBOL made software development easier. (_____)
9. The creation of the World Wide Web by Tim Berners-Lee in 1989 made it easier to **cacs** information and share documents across networks. (_____)
10. Modern trends include smartphones, artificial intelligence, and **dcluo** computing. (_____)

Exercise 3. Translate the following sentences into English.

1. Эпоха до появления электронных компьютеров богата изобретательными инструментами и дисциплинированным мышлением. Она начинается с простых средств для счета и заканчивается мощными устройствами и сетями, которые соединяют мир.
2. В XVII веке математики и изобретатели создавали механические вычислительные машины. Один из известных примеров — механический калькулятор Блеза Паскаля, который мог складывать и вычитать числа с помощью шестеренок. Позже Готфрид Вильгельм Лейбниц усовершенствовал конструкцию и создал машину, которая могла умножать и делить.

3. Ада Лавлейс, работавшая с Бэббиджем, написала заметки, описывающие, как машина может выполнять последовательность операций. Многие считают её первым программистом, потому что она описала алгоритм для этой машины.
4. Алан Тьюринг, британский математик, в 1930-х годах предложил идею универсальной вычислительной машины. Он оказал влияние на последующие разработки и теорию вычислений.
5. Важным прорывом стала концепция хранимой программы. Предложенная Джоном Нойманом и другими, эта идея означала, что компьютер может хранить данные и инструкции в памяти.
6. В первых электронных компьютерах использовались вакуумные лампы, которые были большими, сильно нагревались и были ненадежными.
7. Благодаря интегральным схемам компьютеры стали еще меньше и дешевле. Эти достижения позволили разработать персональные компьютеры и множество других электронных устройств.
8. Разработка программного обеспечения также стала формальной дисциплиной, с разработанными методами проектирования, тестирования и сопровождения программ.
9. В XXI веке мобильные устройства и смартфоны сделали вычисления персональными и портативными. Мощные чипы, беспроводные сети и экосистемы приложений позволили людям выполнять множество задач на небольших устройствах.
10. История вычислительной техники — это история идей, изобретений и людей, которые хотели упростить вычисления и решить новые задачи.

➤ SUPPLEMENTARY READING



Exercise 1. Before reading the text, answer the following questions:

1. What do you know about the first computers built in the 20th century?
2. Why do you think the invention of electronic computers was important for technological development?
3. What does ENIAC stand for?

Exercise 2. Read and translate the text

EARLY ELECTRONIC COMPUTERS

The history of computing is filled with remarkable innovations that have transformed the way we live and work. One of the most important periods in this history is the era of early electronic computers, which laid the foundation for modern technology.

The first electronic computers appeared in the 1940s and marked a significant leap from mechanical and vacuum tube devices. These early machines were large, complex, and expensive, but they introduced the idea of automating calculations and

data processing. One of the earliest and most famous computers was the ENIAC (Electronic Numerical Integrator and Computer), built in the United States in 1945. ENIAC was massive (covering about 1,800 square feet) and used around 18,000 vacuum tubes. Despite its size, it could perform thousands of calculations per second, a huge achievement at the time.

Another important early computer was the EDVAC (Electronic Discrete Variable Automatic Computer), which was designed to be more flexible than ENIAC. EDVAC introduced the concept of stored programs, meaning the computer could store instructions in its memory and run different applications without rewiring. This idea became the basis for modern computers.

In the 1950s, the development of transistors replaced vacuum tubes, making computers smaller, faster, more reliable, and energy-efficient. The UNIVAC I (Universal Automatic Computer), built in 1951, was one of the first commercially produced computers and was used for business and government applications. It demonstrated that computers could be useful beyond laboratories and universities.

Despite their size and cost, early electronic computers revolutionized data processing and paved the way for future innovations. They introduced essential concepts like binary number systems, stored programs, and digital logic, which are still fundamental today. The early electronic computers were groundbreaking inventions that shifted the paradigm from manual calculations to automated processing. Their development marked the beginning of the digital age, leading to the powerful computers we use now.

Exercise 3. Answer the following questions based on the text “Early Electronic Computers”:

1. How did the ENIAC differ from mechanical and vacuum tube devices that preceded it?
2. What was the major innovation introduced by the EDVAC, and why was it important?

3. How did the development of transistors in the 1950s impact the evolution of computers?
4. What are some fundamental concepts introduced by early electronic computers that are still used today?

➤ SPEAKING

Exercise 1. Considering the evolution from early mechanical calculators to modern computers, which invention do you think was the most revolutionary in the history of computing and why? Discuss with your partner your opinion, providing reasons and examples. Be prepared to support your point of view and listen to your partner's perspective. Share your ideas with your groupmates.

Exercise 2. Using information you have learnt in Unit 1 on the history of computing, choose one statement either to agree or disagree with and give a 2 – 4 minute presentation to the group:

1. Early mechanical calculators were entirely independent of later electronic computers and had little influence on their development.
2. The development of high-level programming languages greatly accelerated the growth of software industry and computing capabilities.
3. The creation of the Internet was a natural progression of earlier networking experiments, and it would have happened even without the development of computers.

Exercise 3. Role play a 2 – 4 minute interview of a historian giving a brief presentation on the development of computing technology and a journalist asking questions about key milestones.

Questions to ask and answer:

- **What were the main challenges faced by early inventors of calculators?**

- **How did the invention of the transistor change the landscape of computing?**
- **What is the significance of the creation of the Internet in the history of computing?**

Take turns playing the roles of a historian and a journalist, discussing these questions in detail.

Exercise 4. Compare the development of hardware (like the first computers) and software (such as programming languages). How did each contribute to the progress of computing? In pairs or small groups, discuss the differences, similarities, and how advances in one area influenced the other. Conclude with your thoughts on which aspect was more crucial for the growth of the field. Give a 2 – 4 minute presentation to the group.

UNIT 2. E-COMMUNICATION



➤ LEAD-IN

Answer the questions:

1. In your own words, what is e-communication?
2. How does e-communication differ from face-to-face communication?
3. As future IT professionals, which type of e-communication do you think will be the most important in your career and why?

➤ READING

Read and translate the text

E-COMMUNICATION

E-communication means any kind of communication that happens through electronic devices and computer networks. Today, it is one of the most common ways people share information, make decisions, and build relationships. For IT students, understanding e-communication is important not only as users but also as future developers, system administrators, and designers. This text explains what e-communication is, describes its main types, and discusses how it affects different parts of society.

Definition and key features

At its core, e-communication includes sending, receiving, and storing messages with the help of electronic tools. These tools can be simple, like a mobile phone, or complex, like a cloud messaging platform. Key features of e-communication are speed, reach, and the ability to include different media types—text, images, audio, and video. Unlike face-to-face communication, e-communication often leaves digital traces, such as logs and metadata, which can help or harm users depending on how they are managed.

Main types of e-communication

Email

Email is one of the oldest and most widely used e-communication methods. It is useful for formal messages, business communication, and sending documents. Emails are asynchronous, which means the sender and receiver do not have to be online at the same time. This makes email convenient for long-distance and international communication.

Instant messaging and chat apps

Instant messaging apps allow real-time text conversations. They are faster than email and often include features like group chats, file transfer, voice messages, and video calls. In the workplace, tools like Microsoft Teams combine chat with project management functions.

Social media

Social media platforms enable users to publish posts, share media, and interact with large audiences. Social media is powerful for marketing, public relations, and social movements. It supports public and semi-public forms of communication, where messages can spread quickly and reach millions of people.

Video conferencing and online meetings

Tools such as Zoom, Google Meet, and Microsoft Teams have become essential for education and business. Video conferencing allows participants to see and hear each other in real time, making remote collaboration and learning more effective. These tools also support screen sharing, recording, and virtual whiteboards.

Blogs and forums

Blogs are online journals where people write articles, tutorials, and opinions. Forums (like Stack Overflow for programmers) are places for questions and answers, technical discussions, and knowledge sharing. Both formats encourage longer, more detailed content than social media posts.

SMS and voice calls

Although older than internet-based tools, SMS and voice calls remain important, especially where internet access is limited. Mobile networks enable basic e-communication that is reliable and easy to use.

Machine-to-machine communication (M2M) and IoT messaging

In modern IT systems, electronic communication also happens between devices. The Internet of Things (IoT) uses protocols like MQTT or HTTP to let sensors, appliances, and servers exchange data. This type of e-communication is crucial for smart homes, industrial automation, and healthcare monitoring.

Impact on society

Education

E-communication has changed education by enabling online courses, virtual classrooms, and digital libraries. Students can attend lectures from anywhere and collaborate on projects using cloud tools. However, it also requires good digital literacy and access to reliable internet.

Business and work

Many companies use e-communication to improve productivity, manage remote teams, and reach customers. Online platforms support customer service, e-commerce, and marketing. The move to remote work has increased demand for secure and efficient communication systems, which is an opportunity for IT students to develop new solutions.

Healthcare

Telemedicine allows doctors and patients to communicate online through video calls, secure messaging, and remote monitoring. E-communication improves access to care but raises concerns about data privacy and the need for secure systems.

Politics and public life

Governments use e-communication for public announcements, online services, and citizen engagement. Social media can mobilize public opinion quickly, but it can also spread misinformation. Understanding how information spreads online is important for maintaining healthy public discourse.

Privacy, security, and ethical concerns

While e-communication brings many benefits, it also creates risks. Digital messages can be intercepted, hacked, or misused. Privacy issues include unauthorized data collection and targeted advertising. Students in IT fields must learn about encryption, secure protocols, authentication, and data protection laws like GDPR (General Data Protection Regulation). Ethical questions include how to balance free speech with the fight against misinformation.

Netiquette and digital responsibility

Using e-communication well requires good manners or “netiquette”. This includes writing clear subject lines in emails, respecting others in group chats, avoiding excessive notifications, and checking sources before sharing information. For professionals, it also means documenting communication and keeping records according to company policies.

Future trends

E-communication will keep evolving. Artificial intelligence and chatbots already help with customer service and personal assistants. AR (augmented reality) and VR (virtual reality) may create new immersive communication environments. As devices become more connected, ensuring interoperability, security, and privacy will be a major challenge and a career opportunity for IT graduates.

E-communication is a wide field that affects almost every part of modern life. For IT students, understanding its types (email, instant messaging, social media, video conferencing, blogs, SMS, and IoT) is the first step toward building better, safer communication systems. Students should learn both technical skills (like secure coding and network protocols) and soft skills (like clear writing and digital ethics). In

this way, they can help society use e-communication in ways that are efficient, inclusive, and responsible.

➤ VOCABULARY

1.	e-communication [ˌiː kəˌmjuːnɪˈkeɪʃən]	электронная коммуникация
2.	digital ['dɪdʒɪtəl]	Цифровой
3.	asynchronous [eɪˈsɪŋkrənəs]	Асинхронный
4.	instant messaging ['ɪnstənt ˈmɛsɪdʒɪŋ]	мгновенные сообщения
5.	video conferencing ['vɪdiəʊ ˈkɒnfərənsɪŋ]	Видеоконференция
6.	to encourage [tuː ɪnˈkʌrɪdʒ]	Способствовать
7.	telemedicine [ˌtɛləˈmɛdɪsɪn]	Телемедицина
8.	encryption [ɪnˈkrɪptʃn]	Шифрование
9.	netiquette ['nɛtɪkɛt]	Нэтикет
10.	privacy ['praɪvəsi]	конфиденциальность
11.	interoperability [ˌɪntərəˌpərəˈbɪlɪti]	Совместимость
12.	cloud messaging platform [klaʊd ˈmɛsɪdʒɪŋ ˈplætfɔːrm]	облачная платформа для обмена сообщениями
13.	face-to-face communication [feɪs tə feɪs kəˌmjuːnɪˈkeɪʃən]	личное общение
14.	digital traces ['dɪdʒɪtəl ˈtreɪsɪz]	цифровые следы
15.	remote collaboration [rɪˈmoʊt kəˌlæbəˈreɪʃən]	удаленное сотрудничество
16.	technological advances [ˌtɛknəˈlɒdʒɪkəl ədˈvɑːnsɪz]	технологические улучшения
17.	data privacy laws ['dɛtə ˈpraɪvəsi lɔːz]	законы о конфиденциальности данных
18.	knowledge sharing ['nɒlɪdʒ ˈʃeɪɪŋ]	обмен знаниями
19.	long-distance communication [lɔːŋ ˈdɪstəns kəˌmjuːnɪˈkeɪʃən]	долгосрочная связь
20.	digital literacy ['dɪdʒɪtəl ˈlɪtərəsi]	цифровая грамотность
21.	interdevice communication [ˌɪntərɪˈvaɪs kəˌmjuːnɪˈkeɪʃən]	межустройственная коммуникация
22.	ethical concerns ['ɛθɪkəl kənˈsɜːrns]	этические вопросы
23.	screen sharing [skrɪn ˈʃeɪɪŋ]	совместное использование экрана

24.	secure coding [sɪ'kjʊə 'kəʊdɪŋ]	безопасное кодирование
25.	network protocols ['nɛtwɜ:k 'prəʊtəkɒlz]	сетевые протоколы
26.	augmented reality [ɔ:g'mentɪd rɪ'ælɪtɪ]	дополненная реальность

➤ COMPREHENSION CHECK

Exercise 1. Match the type of e-communication with its description:

- | | |
|-----------------------|--|
| 1. Email | a. Allows real-time conversations |
| 2. Instant Messaging | b. Provides a platform for longer articles and discussions |
| 3. Video Conferencing | c. Often used for formal communication |
| 4. Blogging | d. Essential for remote collaboration |

Exercise 2. Say if the following statements are true or false. If it is false, correct it according to the text.

1. E-communication only includes communication that occurs through mobile phones.
2. Instant messaging is typically faster than email and can include features like group chats.
3. E-communication has no impact on education or learning environments.
4. Video conferencing tools such as Zoom and Google Meet allow participants to see and hear each other in real time.
5. SMS and voice calls are now obsolete due to the rise of internet-based communication tools.
6. Social media platforms are effective for marketing and public relations.

7. Digital traces left by e-communication, such as logs and metadata, can only be beneficial to users.
8. Ethical questions related to e-communication include balancing free speech and combating misinformation.
9. IT students do not need to understand privacy and security issues related to e-communication.
10. The text suggests that e-communication will continue to evolve, with potential future trends such as augmented reality and artificial intelligence.

Exercise 3. Answer the following questions based on the text:

1. What is e-communication?
2. What are its key features? (give at least three of them)
3. How does e-communication differ from face-to-face communication?
4. What are the main privacy, security, and ethical concerns associated with e-communication?
5. In what ways has e-communication changed education and workplace practices, and what new skills must IT students develop as a result?
6. How can social media both benefit and harm public life according to the text?
7. What is “netiquette,” and what are three recommended practices for professional digital communication?
8. What future trends in e-communication were highlighted, and what career opportunities or challenges might they create for IT graduates?

➤ **VOCABULARY EXERCISES**

Exercise 1. Match each word (1–10) to the correct definition (a–j).

WORDS:

1. e-communication
2. asynchronous

DEFINITIONS:

- a. Rules or standards that devices or systems follow to exchange data.
- b. A set of manners and conventions for polite online behaviour.
- c. Data about data (for example,

3. metadata	timestamps or sender info associated with a message).
4. cloud	d. Communication that uses electronic devices and networks.
5. encryption	e. Remote healthcare services delivered via video calls or online messaging.
6. IoT	f. The ability of different systems or devices to work together and exchange information.
7. protocol	g. A network service model where data and apps are hosted on remote servers and accessed via the Internet.
8. telemedicine	h. The Internet of Things — networked devices that exchange data with each other.
9. netiquette	i. Converting information into a secure form to prevent unauthorized access.
10. interoperability	j. Communication where sender and receiver do not need to be online at the same time.

Exercise 2. Fill in the blanks with the best word from the bank:

WORD BANK:

email, instant messaging, social media, video conferencing, logs, SMS, sensors, chatbot, screen sharing

1. Students often use _____ to attend lectures and group discussions remotely.
2. Businesses keep server _____ to track events and troubleshoot issues.
3. Short text messages sent via mobile networks are called _____.
4. A(n) _____ can answer customer questions automatically on a website.
5. _____ platforms let people publish posts that can reach large audiences.

6. _____ apps let colleagues have quick, real-time conversations.
7. Sending documents and formal notices is commonly done by _____.
8. Smart thermostats use built-in _____ to measure temperature and send data.
9. During remote meetings many participants use _____ to show slides or demos.

Exercise 3. Use the base word in parentheses to form the correct word to complete each sentence.

1. IT students must learn about data _____ to protect users' personal information. (protect)
2. The new app improved team _____ by letting different tools work together. (operate)
3. Designers focus on _____ interfaces that are easy for users to understand. (use)
4. Companies must ensure the _____ of messages when using public networks. (secure)
5. The professor emphasized the importance of digital _____ in online discussions. (responsible)

Exercise 4. Translate the following sentences into English.

1. Электронная коммуникация означает любой вид общения, осуществляемый посредством электронных устройств и компьютерных сетей.
2. Для студентов, изучающих информационные технологии, понимание электронной коммуникации важно не только как для пользователей, но и как для будущих разработчиков, системных администраторов и дизайнеров.
3. Ключевые особенности электронной коммуникации — это скорость, охват и возможность включения различных типов медиаконтента — текста, изображений, аудио и видео.

4. Электронная почта является асинхронной, это означает, что отправителю и получателю не обязательно находиться в сети одновременно.
5. Приложения для обмена мгновенными сообщениями быстрее электронной почты и часто включают в себя такие функции, как групповые чаты, передача файлов, голосовые сообщения и видеозвонки.
6. Видеоконференции позволяют участникам видеть и слышать друг друга в режиме реального времени, что делает удаленное сотрудничество и обучение более эффективными.
7. Электронная коммуникация изменила образование, позволив проводить онлайн-курсы, создавать виртуальные классы и цифровые библиотеки. Студенты могут посещать лекции из любого места и сотрудничать над проектами, используя облачные инструменты.
8. Хотя электронная коммуникация приносит много преимуществ, она также создает риски, так как цифровые сообщения могут быть перехвачены, взломаны или использованы не по назначению.
9. По мере того, как устройства становятся все более взаимосвязанными, обеспечение совместимости, безопасности и конфиденциальности станет серьезной проблемой и одновременно карьерной возможностью для выпускников ИТ-специальностей.
10. Электронная коммуникация — это обширная область, затрагивающая практически все аспекты современной жизни. Для студентов ИТ-специальностей понимание её типов (электронная почта, мессенджеры, социальные сети, видеоконференции, блоги, SMS и IoT) является первым шагом к созданию более совершенных и безопасных систем связи.

➤ SPEAKING

Exercise 1. Using information you have learnt in Unit 2 on e-communication, choose one statement either to agree or disagree with and give a 2 – 4 minute presentation to the group:

1. Email is asynchronous, so it is for urgent, real-time conversations.
2. Using e-communication well requires good manners or “netiquette”.
3. SMS and calls remain important communication methods in areas with limited internet access.
4. Future developments such as AI, AR, and others will create both career opportunities and major security/privacy challenges for IT graduates.

Exercise 2. Role play a 2 – 4 minute interview of a person who needs help with different types of e-communication, for example, “I can’t join a Zoom meeting”, “I don’t get emails”, “How to send a file via chat”.

Exercise 3. With the pandemic keeping everyone stuck inside and the majority working and studying remotely, many people turned to Zoom. By April 2020, Zoom had 300 million daily meeting participants. As Zoom grew in popularity, so did the Zoom memes. Comment on the Zoom memes below. Have you ever found yourself like in the first or second Zoom meme? Share your first Zoom experience with your groupmates.

Me on online class



HOW TO PREPARE



FOR A ZOOM MEETING



➤ READING

Read and translate the text

THE HISTORY OF CHATGPT

OpenAI was founded in 2015 by Elon Musk and Sam Altman (co-chairs), Greg Brockman (CTO), Ilya Sutskever (research director), and a group of research engineers and scientists. OpenAI started as a non-profit artificial intelligence research organization with the mission to develop artificial general intelligence (AGI) that benefits humanity.

In 2018, Elon Musk stepped down from the board of OpenAI but remained a significant investor, and Sam Altman became OpenAI's CEO in 2019. Around the same time, the company restructured to a capped-profit model to attract new investors and accelerate the development of AI. The restructuring created the for-profit entity OpenAI LP, which remained under the control of the non-profit OpenAI Inc.

The new Open AI CEO and future founder of ChatGPT didn't waste time. Shortly after stepping into his new role, Altman attracted Microsoft as an investor and minority owner – providing the resources to train and improve the AI systems behind today's breakthroughs.

The following exponential growth of OpenAI can be tracked the GPT models' development. ChatGPT isn't OpenAI's only product. Other notable technologies it developed include (among others):

DALL-E – an AI system that creates realistic images based on text descriptions. The first version was released in January 2021, and the second in April 2022.

Codex – an AI system that translates natural language into code in multiple coding languages. It was built on top of the GPT-3 model, launched in partnership with GitHub in July 2021, and released to the public in August 2021.

Whisper – a web-based automatic speech recognition system that can transcribe audio files in multiple languages and translate them into English. The model was released in September 2022 – one month before the launch of ChatGPT.

Open AI's contributions to AI development are numerous, but ChatGPT's release date will remain a milestone in the history of generative AI.

GPT-1

Introduced in June 2018, GPT-1 was OpenAI's first transformer-based language model. With 117 million parameters, GPT-1 was among the most prominent language models at the time. The model used books as training data and could perform various tasks, including textual alignment, semantic similarity, reading comprehension, commonsense reasoning, and sentiment analysis.

GPT-2

OpenAI introduced GPT-2 in February 2019. The model had 1.5 billion parameters and was trained with information from the Internet. It was able to perform a broader scope of tasks without task-specific training.

GPT-3

The company behind ChatGPT released GPT-3 in 2020. At the time, GPT-3 marked a major leap in model scale and capability, with 175 billion parameters and much more powerful performance than previous models. So, instead of releasing an open-source model, OpenAI provided public access to GPT-3 through an API. This

allowed third parties to use the underlying technology, while OpenAI retains some control over the access.

Launched in January 2022, Instruct GPT is a fine-tuned version of GPT-3. Open AI's primary goal with this model was to reduce offensive language and misinformation and provide answers that humans consider helpful.

GPT-3.5

GPT-3.5 – the model behind ChatGPT – is a fine-tuned version of GPT-3 that can understand and generate natural language and code.

ChatGPT

ChatGPT was released to the public in November 2022. The technical capabilities of Instruct GPT and ChatGPT are almost identical. Both models were trained using the Reinforcement learning from Human Feedback (RLHF) method.

What made ChatGPT the Internet service with the fastest-growing user base? The only changes OpenAI made between the January and November releases were adding conversational training data and tuning the training process. But these adjustments made ChatGPT more user-friendly and capable of understanding user preferences. OpenAI has also addressed malicious content issues, deeming ChatGPT safer for public use than the previous models.

GPT-4

Open AI released its GPT-4 model to ChatGPT Plus paid subscribers in March 2023. The model significantly improved ChatGPT's capabilities, especially for complex tasks. It also reflects OpenAI's efforts to diminish the frequency of undesirable or harmful responses.

The most significant GPT-3.5 vs GPT-4 difference is the context window, which increased from around 3,000 words upon ChatGPT's release to approximately 25,000 for GPT-4. In addition, the model produces more factually correct information, has fewer hallucinations, and is less likely to respond to sensitive requests or generate disallowed content.

Another notable improvement includes GPT-4's ability to accept image inputs – although it can only provide text outputs in response. The following OpenAI product, however, takes multimodality to the next level.

Code Interpreter

Released in July 2023, Code Interpreter expanded ChatGPT's ability to work with files, run code, and support complex data analysis tasks. Most notably, it can understand inputs and generate outputs in multiple formats (text, image, video, audio, code) – exponentially increasing its ability to comprehend information and produce the desired results.

ChatGPT became a global cultural phenomenon almost overnight, reaching unprecedented mainstream popularity. Using the momentum, OpenAI started releasing fine-tuned ChatGPT versions and new models much faster.

The GPT technology has now reached its peak – not regarding capabilities (its limitations are numerous) but concerning people's expectations.

➤ **VOCABULARY**

- | | |
|---|----------------------------------|
| 1. found [faʊnd] | основывать, учреждать |
| 2. benefit ['bɛnɪfɪt] | выгода, польза |
| 3. expand [ɪk'spænd] | расширять |
| 4. remain [rɪ'meɪn] | оставаться |
| 5. accelerate [æk'seləreɪt] | ускорять, ускориться |
| 6. development [dɪ'veləpmənt] | развитие, рост |
| 7. Open AI | открытый искусственный интеллект |
| 8. CEO | исполнительный директор |
| 9. contribution [ˌkɒntri'bjuːʃn] | вклад |
| 10. reach [ri:tʃ] | достигать |
| 11. launch [lɔːntʃ] | запускать |
| 12. transcribe [træn'skraɪb] | расшифровывать |
| 13. milestone ['maɪlstəʊn] | веха, этап |
| 14. prominent ['prɒmɪnənt] | видный, заметный |

15. similarity [ˌsɪmɪˈlærəti]	сходство
16. comprehension [ˌkɒmprɪˈhɛnʃn]	понимание, осмысление
17. leap [li:p]	прыгать, скакать, скачек
18. capability [ˌkeɪpəˈbɪləti]	способность, возможность
19. offensive [əˈfɛnsɪv]	агрессивный, наступательный
20. deem [di:m]	считать, полагать
21. significantly [sɪɡˈnɪfɪkəntli]	значительно
22. frequency [ˈfri:kwənsi]	частота
23. comprehend [ˌkɒmprɪˈhɛnd]	постигать, понимать
24. sensitive [ˈsensɪtɪv]	чуткий, чувствительный
25. output [ˈaʊtpʊt]	выход, выпуск
26. preference [ˈprɛfərəns]	предпочтение

➤ COMPREHENSION CHECK

Exercise 1. Answer the questions based on the text. More than one variant can be correct.

1. What was the main purpose of Open AI in 2015?

- a. It wanted to earn a big amount of money.
- b. It was an organization that benefited only some groups of people.
- c. It started as a non-profit artificial intelligence research organization with the mission to develop artificial general intelligence that benefits humanity.
- d. Only a group of research engineers and scientists could benefit from Open AI.

2. What company was attracted as an investor by Sam Altman?

- a. Microsoft
- b. Google Cloud Platform
- c. Sales force
- d. IBM Cloud

3. What tasks could GPT-1 perform?

- a. It could do textual alignment, reading comprehension.

- b. It could do common sense reasoning and sentiment analysis.
- c. It could create realistic images.
- d. It could transcribe audio files in multiple languages.

4. What factors made Chat GPT more user-friendly and capable of understanding user preferences?

- a. Conversational training data and tuning the training process were added to Chat GPT.
- b. It could understand and generate natural language and code.
- c. It was able to perform a broader scope of tasks without task-specific training.
- d. It could use books as training data.

5. What is the major difference between GPT-3,5 and GPT-4?

- a. The context window increased from around 3000 words upon Chat GPT's release to 25000 for GPT-4.
- b. GPT-4 has an ability to accept image inputs.
- c. GPT-4 has more hallucinations.
- d. GPT-4 is more likely to respond to sensitive requests or generate disallowed content.

Exercise 2. Make up questions based on the text.

- 1. What_____?
- 2. When_____?
- 3. Who _____?
- 4. Why_____?
- 5. What kind of_____?
- 6. How_____?
- 7. How important_____?

Exercise 3. Work with a partner. Ask each other questions from exercise 2.

Exercise 4. Match each word with its definition.

- a. **humanity**_____1: act of asking for something politely
- b. **significant**_____2: to supply or make available
- c. **profit**_____3: process of growing or changing over time
- d. **accelerate**_____4: state of being alike or having common features
- e. **description**_____5: carry out a task or an action
- f. **development**_____6: ability to understand something
- g. **multiple**_____7: all human beings collectively
- h. **launch**_____8: having considerable importance or effect
- i. **contribution**_____9: arrangement in straight line
- j. **alignment**_____10: occurring more than once or several times
- k. **similarity**_____11: money earned after subtracting costs
- l. **comprehension**____12: to move faster
- m. **perform**_____13: something given that adds to a larger whole
- n. **provide**_____14: spoken or written representation of something
- o. **request**_____15: to start a project or activity

Exercise 5. Summarize the main idea of the text in 6-8 sentences and express your attitude to the topic which is touched upon in it.

➤ EXERCISES

Exercise 1. Give synonyms and antonyms to the following words:

Give **synonyms** to the following words Give **antonyms** to the following words

to remain - _____ complex - _____
 significant - _____ harmful - _____
 to provide - _____ increase - _____
 numerous - _____ to benefit - _____
 powerful - _____ to attract - _____
 goal - _____ profit - _____
 ability - _____ accelerate - _____

Exercise 2. Give English equivalents to the following phrases:

1. приносит пользу человечеству_____
2. остался крупным инвестором_____
3. ускорить развитие ИИ_____
4. системы распознавания речи_____
5. способность понимать предпочтения пользователя_____
6. значительные улучшения_____
7. особенно для сложных задач_____
8. принимать вводимые изображения_____
9. стало мировым культурным явлением_____
10. технические возможности_____

Exercise 3. Choose the appropriate preposition from the box to put in the blanks:

to; in; down; to; at; of; on; in; with; for

1. Sam Altman was the founder _____ Chat GPT.
2. The system creates realistic images based _____ text descriptions.
3. The first version was released _____ January 2021.
4. Elon Musk stepped _____ from the board.
5. The system was launched _____ partnership with Github.
6. Open AI's contributions _____ AI development are numerous.
7. GPT-1 was among the most prominent language model _____ the time.
8. Open AI provided public access _____ GPT – 3.
9. The model significantly improved Chat GPT's capabilities, especially _____ complex tasks.
10. GPT has an ability to work _____ files.

Exercise 4. Fill in the blanks with the appropriate vocabulary words from the box:

*significantly/sensitive/contribution/expand/capability/reach/milestone/
leap/preferences/outputs*

1. Sam Altman made a significant _____to the development of AI.
2. Yandex wants to _____ it's influence in eastern markets in order to gain more profit.
3. The_____ of GPT-3to accept image inputs made it more user-friendly.
4. ChatGPT's release date will remain _____in the history of generative AI.
5. The GPT technology _____its peak in 2024.
6. Mike is a very _____person.
7. The model _____improved ChatGPT's capabilities.
8. In 2020 GPT-3 marked a major _____in model scale and capability.
9. ChatGPT is capable of understanding user _____.
10. ChatGPT generates _____in multiple formats such as texts, images, codes.

➤ **SUPPLEMENTARY READING**

Exercise 1. Answer the following questions:

1. In what spheres of modern life can we find the advantages of using AI? (Name at least 5)

2. Why is personalization important in ecommerce? (Provide examples)
3. Can AI work without breaks? (Justify your opinion)
4. What are the main reasons for considering AI decisions to be more accurate?
5. What processes can be automated with the help of AI?
6. Can you name at least 4 monotonous tasks which AI can facilitate?
7. Can AI process and derive conclusions from big data in less time? (Provide examples)

If you have problems answering these questions now, read the text below and go back to the questions then. Pay special attention to the pronunciation of the following words:

boundless ['baʊndləs].....	безграничный
advancement [əd'vɑːnsmənt].....	продвижение, развитие
vehicle ['viːkəl].....	транспортное средство
preference ['prɛfərəns].....	предпочтение
enhance [ɪn'hɑːns].....	усилить, укрепить
engagement [ɪn'geɪdʒmənt].....	помолвка
subscriber [sʌbsaɪbər].....	подписчик
maintain [meɪn'teɪn].....	поддерживать
appropriate [ə'prɒpriət].....	подходящий
tedious ['tiːdiəs].....	утомительный
instant ['ɪnstənt].....	моментальный
resolve [rɪ'zɒlv].....	разрешить
repetitive [rɪ'petɪtɪv].....	повторяющийся
assembly [ə'sembli].....	сборка, монтаж
predict [prɪ'dɪkt].....	предсказывать
accelerate [ək'seləreɪt].....	ускорять
emphasize ['emfəsaɪz].....	подчеркивать
reduce [rɪ'djuːs].....	уменьшать
require [rɪ'kwaɪə].....	требовать
revenue ['revənjuː].....	доход
consistent [kən'sɪstənt].....	последовательный
rigid ['rɪdʒɪd].....	жесткий, твердый
manually ['mænjuəli].....	вручную

Exercise 2. Read and translate the text:

TOP BENEFITS OF ARTIFICIAL INTELLIGENCE

The advantages of Artificial Intelligence are boundless, ranging from task automation to informed decision-making, medical diagnosis, the advancement of autonomous vehicles, and many more. According to a Gartner survey of July 2023, 79% of corporate strategists said technologies such as AI would be crucial for business success in the next two years. Here are the advantages of AI:

1. Personalization

AI enables personalization to work on the user's preferences, powers recommendation systems for content and products, targeted advertising, and personalized marketing. In ecommerce, AI customizes purchase experiences and offers personalized recommendations on products likely to be purchased. AI also adapts the content and user interfaces according to the user's preferences to enhance user engagement across different domains.

For example, Netflix uses AI algorithms to understand the user's viewing history, needs, and interactions to recommend TV shows and movies that the user is likely to watch. This leverages machine learning models and gives a personalized viewing experience to every subscriber, thereby increasing retention rates.

2. Uninterrupted Operations

Human brain demands time and breaks to function optimally and maintain productivity. AI can work uninterrupted without taking breaks. They think faster than humans and implement multiple tasks concurrently with appropriate results. They can also manage tedious processes easily with AI algorithms.

For example, online customer support chatbots offer instant support to customers from anywhere, anytime. With AI and Natural Language Processing (NLP), chatbots can resolve issues, answer queries, and report high-level requests to human agents to ensure streamlined customer service 24x7.

3. Helps to Make Unbiased Decisions

Whether we like them or not, emotions are what drive human beings. AI, on the contrary, doesn't respond to emotions; instead, it is practical and adopts a rational approach. AI has no biased views, which ensures the decisions are more accurate.

For example, AI-driven recruitment systems can screen candidates based on their qualifications instead of their demographics. It eliminates hiring bias, leading to a more diverse and inclusive workforce.

4. Implements Automation

As a part of our everyday work, we might be doing many repetitive tasks, like sending thank you emails, checking a document for bugs, etc. Using AI can help automate these chores and avoid these boring tasks, which allows people to be more creative.

For example, using robots in manufacturing assembly lines helps manage repetitive tasks like welding, packaging, etc., with precision, minimizing overall costs and enhancing efficiency.

5. Research & Development

AI analyses massive datasets, detects patterns, and predicts outcomes that make decision-making effective while accelerating innovation. It automates processes, which lets researchers emphasize complex problem-solving and other tasks.

For example, Amazon is the best example of how AI serves the retail industry. Amazon uses AI algorithms to learn customer behavior, analyze product demand and manage inventory. This has helped the brand optimize its supply chain, minimize costs, and ensure that the popular product stays in stock.

6. Improves Processes & Workflows

AI facilitates the automation of monotonous tasks in segments like data entry, data collection, email responses, invoice processing, etc. With AI-based systems and automated management of processes, employees get time to focus on the tasks that demand human supervision.

For example, an AI chatbot resolves basic user queries about account balances and transaction history and reduces wait times, making banking more efficient.

7. Big Data-Driven Decisions

AI has the skills and algorithms to process and derive conclusions from big data in less time. AI can easily grasp and extract the information required for analysis. AI can also process this data further with transformation and interpretation.

For example, Google uses AI algorithms to deliver accurate search results and advertisements, which helps optimize ad revenue through real-time management and personalization of results based on user behavior.

8. Control and Transparency

Traditional programming gives developers complete control over the logic and software behavior, which enables precise customization and produces consistent outcomes. If the program does not work as desired, developers can trace back the codebase to detect and correct the issue. AI systems, especially complex models such as deep neural networks, could be difficult to manage and interpret.

They usually work like ‘black boxes’ in which input and output are known; however, the process the model uses to move from one to the other is unclear. This becomes problematic in industries that emphasize process and decision-making ability.

9. Learning and Data Handling

Conventional programming is rigid as it depends on structured data to run programs, and it is difficult to process unstructured data. To train the program with a piece of new information, the programmer should add new data manually or adjust processes. Traditionally coded programs even confront independent iteration.

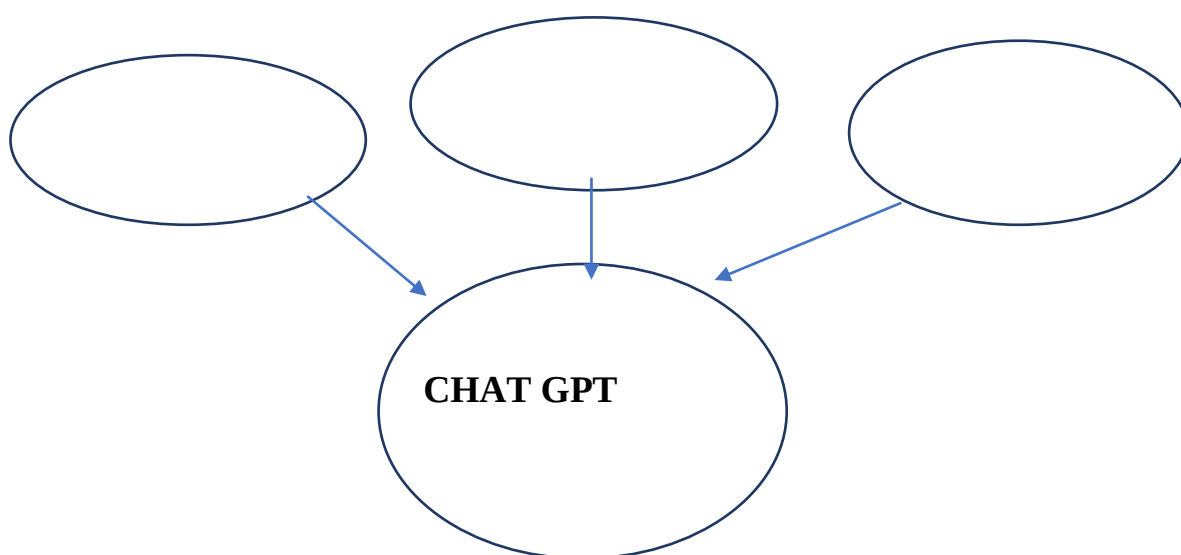
For instance, they might not be able to incorporate unforeseen circumstances without performing explicit programming. Since AI systems use a huge amount of data for learning, they are ideal for processing unstructured data such as images, videos, and natural language text. AI systems can also learn continuously with new data and experiences, which lets them improve their performance with time and makes them highly significant in dynamic environments where the ideal solution can evolve with time.

Exercise 1. You have read about the main benefits of using Artificial Intelligence in modern life. Name at least 8 disadvantages of using Artificial Intelligence in different spheres of our life.

Exercise 2. You work in a recruitment department of a big Russian company producing fertilizers. You must find a chief accountant. The first stage of selecting candidates has been done by AI. Now you must check the results, find the mistakes and choose the best candidate.

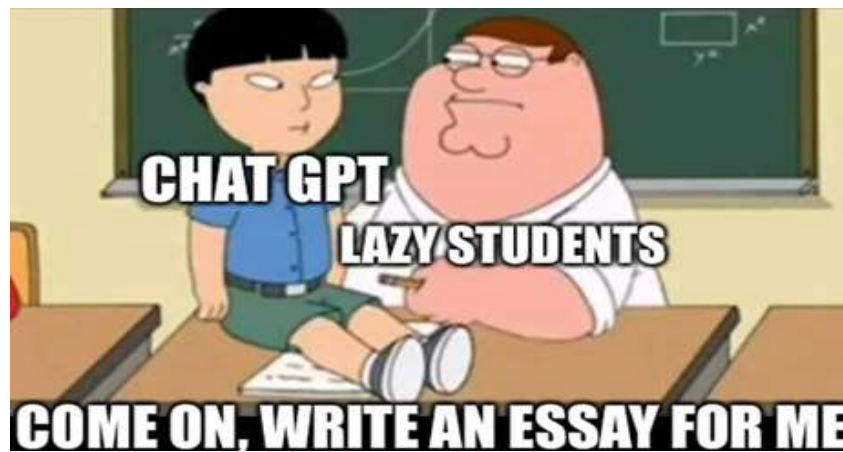
➤ SPEAKING

Exercise 1. Create appropriate collocations:



Exercise 2. Describe the meaning of the following memes about ChatGPT in your own words. Find five more memes and explain their meaning.





Exercise 3. Make a dialogue with your partner and discuss all the advantages and disadvantages of using ChatGPT in your studies. Provide examples.

Exercise 4. Express your agreement or disagreement with the given statement. Justify your opinion in 5-8 sentences.

One of the significant ethical concerns surrounding GPT-2 was the potential for biased, offensive, or harmful outputs. The model learned from vast amounts of internet text, which inevitably contained biases and inappropriate content. This raised concerns about perpetuating and amplifying existing societal biases through the model's text generation.

Exercise 5. Read the information and express your agreement or disagreement in 8-15 sentences.

These jobs are more likely to be taken over by AI: mathematicians, tax preparers, writers, web designers, programmers, accountants, journalists, legal secretaries. Jobs

that are less likely to be impacted by GPT are as follows: graphic designers, search marketing strategies, financial managers. The researchers also list LLM's impact on various industries. Industries with the most significant impact are as follows: data processing services, information services, publishing industries, insurance carriers. On the other hand, the industries with the most negligible impact are: food manufacturing, wood product manufacturing, support manufacturing, agriculture forestry.

Exercise 6. You work as a Data Analyst in a big Russian company which sells fertilizers in many countries. You are to make a research of Chinese market and analyze all its advantages and weak points. Prepare two reports. The first should be prepared by ChatGPT only and the second by you and ChatGPT. Compare the results.

UNIT 4. KEEPING SAFE ONLINE



➤ READING

Read and translate the text

HOW TO KEEP YOUR FAMILY SAFE ONLINE

Internet security for kids is critical – protecting children from harmful or inappropriate content and contacts, as well as malicious software or attacks. Teaching your children online safety tips can help to keep them safe.

Internet safety tips for children

Children are spending more and more time online, and it's important to talk to them about how to stay safe on the Internet. Making sure that kids know what information to keep private online is essential, for example explaining why they need to keep their passwords private, and not give out personal information. Keeping the computer in a common area, where you can watch and monitor its use, can also be a useful way of ensuring children use the Internet safely.

How to keep your email safe

Email was designed to be as open and accessible as possible, to allow people to communicate with each other. The drawback of this accessibility is that certain aspects of email are not secure, allowing attackers to use emails to cause Internet security problems.

What is email security?

Email security refers to the methods used to protect email accounts and correspondence against unauthorized access, loss, or compromise. Given that email is often used to spread malware, spam, and phishing attacks, email security is an important aspect of Internet security.

How to deal with email spam

Spam emails – also known as junk emails – are unsolicited messages sent out in bulk. Most email providers use algorithms to filter out spam messages, but they can still appear in your inbox despite this. Steps to take include:

Mark spam emails as spam – this will help the email provider to refine their spam filtering. How to mark a message as spam will vary depending on which email client you use.

Never click on a link or open an attachment in a spam email. Doing so could mean you download malware onto your device. At the very least, you confirm to the spammers that yours is an active email account, incentivizing them to send more spam.

Be careful about where you disclose your email address. It's a good idea to have a secondary, throwaway email account that you use solely for email sign-ups and subscriptions, separate from the one you use for friends and family and separate from the one you use for work.

Most email providers will offer privacy settings – review these and make sure they are set to a level you feel comfortable with.

Look into third-party email spam filters. These provide an additional layer of cybersecurity, as emails have to travel through two spam filters before getting to you – your email provider's spam filter plus the third-party app.

If you do find yourself overwhelmed with spam, it could be a sign that your email address has been exposed in a data breach. When this happens, it is recommended to change your email address.

Network security

Network security refers to any activity designed to protect the usability and integrity of your network and data. It targets a variety of threats and stops them from entering or spreading on your network.

How to set up your Wi-Fi router securely

Your Wi-Fi router is an essential aspect of Internet security. It checks all incoming and outgoing traffic and controls access to your Wi-Fi network and, through that, your phones, computers, and other devices. Router security has improved in recent years, but there are still steps you can take to enhance Internet protection.

Changing the default settings of your router, such as the default router name and login details, is an important first step. This can help to make your Wi-Fi network less of a target for potential hackers, as it indicates that the router is being actively managed.

There are various features and settings you can disable to increase the security of your Wi-Fi router. Features such as remote access, Universal Plug and Play and Wi-Fi Protected Set-Up can all be taken advantage of by malware programs. While they may be convenient, turning them off makes your home network safer.

➤ VOCABULARY

- | | |
|--|-------------------------|
| 1. harmful [ˈhɑːmfʊl] | Вредный |
| 2. inappropriate [ˌɪnəˈprəʊpriət] | несоответствующий |
| 3. software [ˈsɒftweə] | программное обеспечение |
| 4. make sure | убедиться, удостоверить |
| 5. essential [ɪˈsɛnʃl] | Существенный |
| 6. give out | раздавать, выдавать |
| 7. accessibility [əkˌsɛsəˈbɪləti] | Доступность |
| 8. refer (to) [rɪˈfɜː] | ссылаться на |
| 9. malware [ˈmælwɛə] | вредоносная программа |
| 10. security [sɪˈkjʊərəti] | Безопасность |
| 11. deal with | иметь дело с |

12.	refine [rɪˈfaɪn]	Усовершенствовать
13.	confirm [kənˈfɜ:m]	Подтверждать
14.	layer [ˈleɪə]	Слой
15.	integrity [ɪnˈtɛgrəti]	Целостность
16.	improve [ɪmˈpru:v]	Улучшать
17.	enhance [ɪnˈhɑ:ns]	усилить, улучшить
18.	various [ˈveəriəs]	Различный
19.	attachment [ˈəˈtætʃmənt]	Вложение
20.	disclose [dɪˈskləʊz]	раскрывать, обнаруживать
21.	careful [ˈkeəfʊl]	осторожный
22.	threat [θreɪt]	Угроза
23.	feature [ˈfi:tʃə]	особенность, свойство
24.	remote [rɪˈməʊt]	Удаленный
25.	include [ɪnˈklu:d]	Включать

➤ COMPREHENSION CHECK

Exercise 1. Number the headings of the paragraphs in the order that they appear in the text.

- _____ How to set up your Wi-Fi router securely
- _____ What is email security?
- _____ Network security
- _____ How to deal with email spam
- _____ Internet safety tips for children
- _____ How to keep your email safe

Exercise 2. Say if the following statements are TRUE (T), FALSE (F) or NOT STATED in the text:

1. Teaching your children online safety tips can help you to keep them safe.
2. It is not important to talk to children about how to stay safe on the Internet.

3. Keeping the computer in a common area, where you can watch and monitor its use, can not be a helpful way of ensuring children use the Internet safely.
4. Email consists of several logical parts such as introduction, main body and conclusion.
5. Email is often used to spread malware, spam and phishing attacks.
6. Most email providers don't use algorithms to filter out spam messages.
7. Never click on a link or open an attachment in a spam email.
8. It is a bad idea to have a secondary, throw away email account that you use solely for email sign-ups and subscriptions.
9. Your Wi-Fi router is an essential aspect of Internet security.
10. Wi-Fi is a wireless network technology for connecting devices to the Internet.

Exercise 3. Put the given fragments in the right order to form sentences.

1. Spending/children/are/more/online/ans/more/.....
2. Important/email/is/security/an/aspect/security/Internet/of/.....
3. Is/to/often/used/email/spread/malware/.....
4. Use/providers/most/email/algorithms/.....
5. Often/email/most/providers/will/settings/privacy/.....
6. Variety/a/it/of/variety/targets/threats/.....
7. Router/your/WiFi/an/essential/of/aspect/.....
8. Has/router/improved/security/recent/in/years/.....
9. Router/is/aspect/Wi-Fi/an/essential/security/Internet/of/.....

Exercise 4. Translate the following sentences into English.

1. Дети проводят все больше и больше времени в сети Интернет.
2. Интернет безопасность является ключевым аспектом в школьном обучении сегодня.

3. Электронная почта была спроектирована, как доступный и открытый инструмент общения.
4. Никогда не нажимайте ссылку или приложение, если вы не уверены.
5. Хорошая идея – иметь вторую запасную почту исключительно для подписок.
6. Существуют различные возможности, чтобы повысить вашу интернет безопасность.
7. К сетевой безопасности относится любой вид деятельности, направленный на защиту ваших данных.
8. Недостаток электронной почты состоит в том, что ее доступность является источником проблем с безопасностью.
9. Необходимо удостовериться, что дети знают, какую личную информацию нельзя раскрывать посторонним людям.
10. Электронную почту часто используют для распространения спама.

Exercise 5. Match each vocabulary word with its meaning.

- | | |
|------------------|-----------------|
| 1. to deal with | a) to confirm |
| 2. careful | b) vital |
| 3. to enhance | c) availability |
| 4. threat | d) to contain |
| 5. feature | e) danger |
| 6. essential | f) diverse |
| 7. accessibility | g) aspect |
| 8. various | h) cautious |
| 9. to include | i) to improve |
| 10. to make sure | j) to handle |

Exercise 6. Summarize the main idea of the text in 6-8 sentences and express your agreement or disagreement with the following sentences:

1. Internet security has become one of the major problems in modern society.

2. Children are spending more and more time online and can give personal information and passwords to criminals.
3. Emails can be the major source of spam.
4. Your Wi-Fi router is an essential aspect of Internet security.
5. There are various features and settings you can disable to increase the security of your Wi-Fi router.

➤ EXERCISES

Exercise 1. Fill in the blanks with the appropriate vocabulary words, changing the form of the word where necessary.

1. Internet addiction can be very **h** _____ to children's mentality.
2. I want to discuss the most **e** _____ aspect of this project with you.
3. The head of the company wants to **i** _____ Internet **s** _____.
4. Children must be **c** _____ with personal information of their parents.
5. Your **i** _____ behavior made me feel ashamed of you.
6. Our partners will **c** _____ the deal as soon as they receive the necessary documents.
7. This device can offer you **v** _____ opportunities.
8. This system allows **r** _____ access to our cameras.
9. Emails might **i** _____ spams and malware.
10. The system implements multiple **l** _____ of security to protect against a variety of **t** _____.

Exercise 2. Match each word with its definition.

- a. **software** _____ 1: state of being whole or undivided
- b. **security** _____ 2: cover or surface with a thin, even coating
- c. **layer** _____ 3: state of being whole or undivided

- d. **feature** _____4: software designed to damage computers
- e. **accessibility** _____5: file sent with an email
- f. **malware** _____6: state of being free from danger or threat
- g. **threat** _____7: ease of being reached or entered
- h. **integrity** _____8: distinctive attribute or aspect of something
- i. **attachment** _____9: computer programs and instructions for operating computers

Exercise 3. Match the words from the columns to create proper collocations (more than one correct match is possible for each word):

to protect from	router security
to check	algorithms
to give out	access
to cause	attacker
to spread	your device
to refer to	children
to allow	methods
to use	personal information
to depend on	malware, spam
to control	security problems
to improve	harmful content

➤ SUPPLEMENTARY READING

Exercise 1. Before reading the text, answer the following questions:

1. What do you know about mobile security?
2. Why is tapping dangerous?
3. What is spoofing?
4. Why is updating your phone's operating system important?

If you have problems answering these questions now, read the text below and go back to the questions then. Pay special attention to the pronunciation of the following words:

technique [tek'ni:k] техника, технология

vulnerable ['vʌlnərəbəl] уязвимый

especially [ɪ'speʃli] особенно

install [ɪn'stɔ:l] устанавливать

deliberately [dɪ'libərətli] намеренно

falsify ['fɔ:lsɪfaɪ] подделывать

identify [aɪ'dentɪfaɪ] выявлять

require [rɪ'kwaɪə] требовать

perceive [pə'si:v] воспринимать

measure ['meɪʒə] измерять, мера

inconvenient [ˌɪnkən'vi:niənt] неудобный

malicious [mə'liʃəs] злонамеренный

recognize ['rekəɡnaɪz] распознавать

series ['siəri:z] ряд, набор

Exercise 2. Read and translate the text:

INTERNET MOBILE SECURITY

Mobile security refers to the techniques used to secure data on mobile devices such as smartphones and tablets and is another aspect of internet protection.

How to tell if your phone is tapped

Your smartphone can be vulnerable to tapping, especially if it has been jailbroken or rooted. Phone tapping can allow third parties to listen to your calls or read messages. If you're concerned your phone may have been hacked, you can look out for signs like unusual background noise on calls, your phone's battery depleting faster than usual, or behaving in strange ways.

If your phone seems to be turning itself on or off without your input, or if apps appear that you don't remember installing yourself, that could indicate that somebody

else has access to your phone. Receiving strange SMS messages, containing a garbled series of letters and numbers, or getting a higher than usual phone bill could also indicate phone tapping.

What is phone spoofing, and how can you stop it?

Spoofing generally involves cybercriminals trying to convince you that information is coming from a trusted source. Phone spoofing is when scammers deliberately falsify the information which appears on your caller ID to disguise their identity. They do this so that victims think an incoming call is coming from their local area or a number they recognize.

To stop phone spoofing, check to see if your phone carrier has a service or app that helps identify and prevent spam calls. You can also look into third-party apps such as RoboKiller or Nomorobo to help you screen calls – but be aware that these apps require you to share private data with them.

Often, if you receive a call from an unknown number, the best thing to do is not answer it. Answering scam calls is a bad idea because the scammers then perceive you as a potential target.

How to remove spy software from your phone

If you're seeing signs that your smartphone has spyware, look at the apps installed on your device. Remove anything that you are unsure of, or don't remember installing.

Updating your phone's operating system can help, as can more extreme measures such as resetting your phone to factory settings. While this might be inconvenient, it can be well worth doing if you're concerned that your phone security has been compromised.

You can use Kaspersky Antivirus for Android to identify and remove malicious viruses and malware from Android phones.

Exercise 3. Answer the following questions:

- What are the signs which can tell you that your phone may have been hacked?
- Why do criminals use spoofing?

- How can you stop phone spoofing?
- What should you do if you receive a call from an unknown number?
- Why is it bad to answer scam calls?

➤ **SPEAKING**

Exercise 1. Role play. You are a parent of a teenager who has serious problems with his/her behavior and who spends all the time online. Try to find a common language with him/her and give some tips about Internet security.

Exercise 2. Role play. Your grandmother is calling you to ask for some piece of advice because a stranger has just phoned her and introduced himself as a social worker who needs some really personal information. Help your grandmother and give her the instruction what to do.

Machine Learning (ML)

Instead of relying on an out-of-the-box traditional program, Machine Learning allows computers to find hidden patterns in data on their own. Engineers feed algorithms huge amounts of input data so the system can make predictions.

Depending on the goal, developers use three main learning paradigms:

- **Supervised Learning:** The algorithm trains on labeled data (where the correct answers are already provided).
- **Unsupervised Learning:** The system processes unlabeled data to find hidden structures, clusters, or anomalies on its own.
- **Reinforcement Learning:** An autonomous agent learns by trial and error, optimizing its behavior based on a system of rewards and punishments.

Deep Learning (DL)

When data gets too massive and complex, standard ML isn't enough. That's where Deep Learning steps in. DL mimics the human brain using multi-layered Artificial Neural Networks (ANNs). Raw data passes through multiple layers of artificial neurons, where each layer extracts increasingly complex features. This approach is essential for handling unstructured data like video, audio, and raw text.

Natural Language Processing (NLP)

Natural Language Processing bridges the gap between human communication and machine code. It trains computers to understand, interpret, and generate human language. NLP powers the tools we use every day, relying on tasks like Sentiment Analysis (tracking customer emotions), Text Summarization, and Named Entity Recognition (NER) to extract key data from text.

Robotics

Robotics blends software engineering with hardware. An autonomous robot isn't just a mechanical arm; it's an agent controlled by an AI backend. Modern robots combine computer vision and DL to interact with the physical world in real time. Some examples of robotics in practice include:

- **Manufacturing:** Robots are commonly used in manufacturing processes, such as assembling and welding, to increase efficiency and precision.

- **Healthcare:** Robots, such as surgery and rehabilitation, are used in healthcare applications to perform delicate and precise tasks and assist patients.
- **Exploration:** Robots are used in exploration applications, such as space and deep-sea exploration, to gather data and perform tasks in dangerous or inaccessible environments.
- **Agriculture:** Robots are used in agriculture applications, such as crop monitoring and harvesting, to increase efficiency and reduce labour costs.
- **Military:** Robots are used in military applications, such as bomb disposal and surveillance, to perform dangerous or high-risk tasks.

AI Challenges

Building AI isn't just about writing clean code; it's also about ethics. The biggest hurdle for modern developers is algorithmic bias. If an AI system is trained on biased inputs or incomplete data, it will produce flawed results. To build Responsible AI, engineers must strictly validate and clean data during the preprocessing phase to prevent software from amplifying human prejudices.

There is still much to learn and discover about AI's capabilities, limitations, and implications. Investing in AI research and development can lead to new and innovative applications, improved efficiency, better decision-making, and solutions to many challenges.

At the same time, addressing the potential risks and ethical considerations associated with AI is crucial, and continued research can help develop ethical frameworks and guidelines.

➤ VOCABULARY

- | | |
|---|--|
| 1. driving force ['draɪvɪŋ fɔːrs] | движущая сила |
| 2. complex data; raw data | сложные (комплексные данные);
необработанные данные |
| 3. hidden patterns ['hɪd.ən 'pæt.ənz] | скрытые закономерности |
| 4. break down [breɪk daʊn] | разделять, разбивать на |
| 5. out-of-the-box [ˌaʊt əv ðə 'bɒks]
(solution) | «из коробки» (готовое решение, которое
работает сразу после установки без |

	дополнительной настройки)
6. make predictions	делать прогнозы
7. step in [step in]	вмешаться (прийти на помощь)
8. learn by trial and error	учиться методом проб и ошибок
9. mimic ['mɪmɪk]	подражать, имитировать
10. multi-layered [ˌmʌltiˈleɪəd]	многослойный, многоуровневый
11. crunch data	«перемалывать», быстро обрабатывать данные <i>slang</i>
12. backend ['bækˌend]	бэкенд; серверная часть (программного обеспечения или веб-приложения)
13. assembling [əˈseɪblɪŋ]	Сборка
14. welding ['weldɪŋ]	Сварка
15. bomb disposal [bɒm dɪˈspəʊzl]	обезвреживание, утилизация бомб
16. surveillance [sɜːˈveɪləns]	наблюдение, слежка
17. hurdle ['hɜːdl]	Препятствие
18. learn by trial and error	учиться методом проб и ошибок
19. hard-coded	жестко закодированный (прописанный в коде вручную, без возможности динамического изменения)
20. learning paradigms ['pærədaimz]	парадигмы / методологии обучения
21. labeled data / unlabeled data	размеченные данные / неразмеченные данные
22. system of rewards and punishments	система поощрений и штрафов в обучении с подкреплением
23. Supervised Learning / Unsupervised Learning	контролируемое / неконтролируемое обучение
24. Reinforcement Learning [ˌriːɪnˈfɔːsmənt ˈlɜːnɪŋ]	обучение систем ИИ с подкреплением
25. Sentiment Analysis	анализ тональности текста / определение эмоционального окраса
26. Named Entity Recognition (NER)	распознавание именованных сущностей (выделение имен, дат, локаций из текста)
27. algorithmic bias [ˌælgəˈrɪðmɪk ˈbiːəs]	алгоритмическая предвзятость / системная ошибка алгоритма
28. preprocessing phase	этап предобработки (данных перед обучением)
29. biased inputs ['biːəst ˈɪnpʊts]	предвзятые входящие данные (выборка данных с перекосом в одну сторону)

➤ **COMPREHENSION CHECK**

Exercise 1. Answer the questions based on the text.

1. According to the text, what does understanding AI mean in the IT industry?

- a. Knowing how to write rigid, hard-coded rules manually.
- b. Knowing how systems learn and process data without being explicitly programmed.
- c. Designing sci-fi movies about smart autonomous vehicles.
- d. Creating traditional out-of-the-box software for office computers.

2. Which learning paradigm uses data where the correct answers are already provided?

- a. Unsupervised Learning
- b. Reinforcement Learning
- c. Supervised Learning
- d. Robotic Learning

3. Why do developers use Deep Learning (DL) instead of standard Machine Learning?

- a. Because standard ML models are too expensive for small tech startups.
- b. Because Deep Learning does not need any neural networks to function.
- c. Because standard ML cannot handle too massive and complex unstructured data.
- d. Because Deep Learning is much easier to program by hand.

4. What task does Natural Language Processing (NLP) rely on to track customer emotions?

- a. Sentiment Analysis
- b. Text Summarization
- c. Named Entity Recognition (NER)
- d. Object Detection

5. What is the main cause of algorithmic bias according to the text?

- a. Writing clean code without any syntax or formatting mistakes.

- b. Training an AI system on biased inputs or incomplete datasets.
- c. Using robots instead of human labor in modern manufacturing.
- d. Allowing computers to communicate with other machines over the cloud.

Exercise 2. Make up questions based on the text.

1. **What** _____?
2. **How** _____?
3. **Why** _____?
4. **Which** _____?
5. **Where** _____?
6. **When** _____?
7. **Who** _____?
8. **Whose** _____?
9. **How much** _____?
10. **How many** _____?

Exercise 3. Work with a partner. Ask each other questions from exercise 2 and answer them.

Exercise 4. Match each word with its definition.

- | | |
|--------------------------|---|
| 1. hurdle | a. careful watching of a person, place, or situation, usually using hidden cameras or sensors |
| 2. bomb disposal | b. raw training data that contains human prejudices, errors, or unequal information |
| 3. out-of-the-box | c. the activity or process of joining pieces of metal together by heating them |
| 4. break down | d. the act of making a dangerous object (like an explosive or bomb) safe or destroying it |
| 5. biased inputs | e. need or depend on someone or something to work correctly |
| 6. multi-layered | f. extremely important or necessary, because it affects the |

success of something

- | | |
|------------------------------|---|
| 7. driving force | g. machines with wheels or tracks used for transporting people or goods, such as cars, trucks, or buses |
| 8. crucial | h. divide something complex into smaller, simpler parts to understand it better |
| 9. sentiment analysis | i. having many levels, layers, or deep steps of processing |
| 10. surveillance | j. a computer process that automatically tracks and finds out customer emotions from text |
| 11. rely on | k. copy the way someone or something speaks, moves, or acts |
| 12. welding | l. a problem, difficulty, or obstacle that you must overcome to achieve a goal |
| 13. input data | m. the main power, reason, or energy that makes something happen or develop successfully |
| 14. hard-coded | n. ready to be used immediately after buying, without needing any custom changes or extra setup |
| 15. mimic | o. the raw information, text, or numbers that you feed into a computer program or AI system |
| 16. vehicles | p. put directly into the software code manually by a programmer, making it rigid and difficult to change later |

Exercise 5. Summarize the main idea of the text in 6-8 sentences and express your attitude to the topic which is touched upon in it.

➤ EXERCISES

Exercise 1.

Give **synonyms** to the following Give **antonyms** to the following words:
words:

- | | |
|----------------|---------------|
| 1. to rely on | a. crucial |
| 2. predictions | b. autonomous |

- | | |
|-------------------|-------------------|
| 3. to step in | c. explicit |
| 4. to mimic | d. responsible |
| 5. vehicle | e. labeled |
| 6. out-of-the-box | f. supervised |
| 7. fraud | g. structured |
| 8. data | h. hard-coded |
| 9. to train | i. out-of-the-box |
| 10. crucial | j. Biased |

Exercise 2. Give English equivalents to the following phrases:

1. преодолеть разрыв
2. учиться методом проб и ошибок
3. обучаться на предвзятых или неполных данных
4. искать скрытые закономерности
5. заглядывать «под капот»
6. обрабатывать неразмеченные данные
7. имитировать человеческий мозг
8. делать прогнозы
9. проходить через многочисленные слои
10. полагаться на готовые программы
11. обрабатывать огромные массивы данных
12. жестко закодированная логика
13. выполнять опасные или сопряженные с высоким риском задачи
14. интегрировать компьютерное зрение и глубокое обучение

Exercise 3. Choose the appropriate preposition from the box to put in the blanks. Some prepositions can be used more than once.

in, on, under, from, behind, on, with, up

1. Artificial Intelligence is the driving force _____ autonomous vehicles and smart diagnostics.
2. In the IT industry, understanding AI means knowing how systems learn without being programmed _____ hand.
3. Developers can spin _____ a new machine learning model on cloud servers within a few minutes.
4. Instead of relying _____ rigid rules, modern software finds hidden patterns on its own.
5. In supervised learning, the algorithm trains _____ labeled datasets where the correct answers are provided.
6. A reinforcement learning agent optimizes its behavior based _____ a system of rewards and punishments.
7. If you want to understand how the system works _____ the hood, you need to study its neural layers.
8. Natural Language Processing bridges the gap _____ human communication and machine code.
9. Named Entity Recognition is used to extract key data _____ raw text files.
10. Computer vision allows self-driving cars to interact _____ the physical world in real time.
11. Automated systems can flag suspicious transactions to prevent users _____ financial fraud.
12. If an AI system is trained _____ biased inputs, it will produce flawed and unfair results.
13. Engineers spend up to 70% of their time _____ the preprocessing phase cleaning the data.
14. Traditional out-of-the-box programs often fail when dealing _____ massive amounts of unstructured data.

Exercise 4. Fill in the blanks with the appropriate vocabulary words from the box. NB: One phrase will not be used.

WORD BANK

anomalies / artificial neural networks / algorithmic bias / chatbots / crunch / explicitly programmed / flag / fraud detection / hard-coded / labeled data / out-of-the-box / preprocessing phase / sentiment analysis / spin up / unstructured data

1. Instead of writing instructions manually, modern systems learn from data without being _____.
2. If you don't want to spend months developing your own software, you can buy an _____ solution that works immediately.
3. Our team needs to _____ a new machine learning model on the cloud before the weekend presentation.
4. Old software used _____ rules, which made it very difficult to updates or change parameters later.
5. In supervised learning, the algorithm must train on _____ so it knows the correct answers in advance.
6. The system is designed to automatically _____ any login attempt from an unknown country as suspicious.
7. Banks heavily rely on automated _____ systems to stop hackers from stealing money from user accounts.
8. Deep learning models mimic the human brain by using multi-layered _____.
9. Social media managers use _____ to find out if customers are happy or angry about a new product release.
10. E-commerce companies need powerful servers to _____ massive amounts of user data every single second.
11. If the training dataset contains prejudices, the software will suffer from _____ and make unfair decisions.

12. To clean and organize the raw text files, engineers spend a lot of time in the _____.
13. Unsupervised learning algorithms are great at scanning datasets to discover hidden clusters and _____.
14. Text files, audio tracks, and high-resolution videos are classic examples of _____ because they do not fit into standard tables.

➤ **SPEAKING**

Exercise 1. Make a dialogue with your partner and discuss the advantages and disadvantages of using Artificial Intelligence. Provide examples.

Exercise 2. Many famous people (including actors, musicians, and writers) openly declare their protest against the free training of AI systems on existing works of art, which should be protected by copyright. **Find such examples in the media and explain why so many creators express their protest.**

Exercise 3. Choose one of the topics below for a short presentation.

1. How would you explain Deep Learning and what happens "under the hood" to a non-technical person (like your grandma or a client)?
2. Imagine you want to spin up a model to find financial scams (fraud detection). How will your system flag a transaction as dangerous or suspicious?
3. Would you prefer a generative chatbot or a real human agent when you contact customer support? Why?
4. Why is algorithmic bias dangerous? Who is responsible when an AI system makes a mistake or an unfair decision?

Exercise 4. Express your agreement or disagreement with the given information. Are language applications enough to master a foreign language? If not, what other methods can you use to learn a language? Justify your opinion in 5-8 sentences.

Many tech companies claim that advanced AI-powered apps are now completely enough to achieve full fluency, making traditional learning obsolete. These platforms can instantly crunch data, fix grammar, and simulate text chats out of the box. However, critics argue that relying only on software is a major mistake because it completely cuts learners off from the real world. To truly master a language, one must read authentic texts, watch real-life videos, dive into the culture, and, most importantly, talk to real people. An algorithm can check your code or verbs, but can a machine that we don't fully understand under the hood truly teach you human connection and cultural empathy?

Exercise 5. Read the information and express your agreement or disagreement in 8-15 sentences.

Artificial Intelligence is developing faster than ever, and many IT companies argue that we should use it everywhere. However, some experts believe that we must stop training systems on private human data because it violates personal privacy. Moreover, algorithmic bias shows that machines can be just as prejudiced as humans, meaning they cannot make fair decisions in courtrooms or hospitals. Finally, because no one really knows what happens under the hood of a complex neural network, we should never give AI full control over critical systems. Human oversight is the only way to ensure Responsible AI, even if it slows down technological innovation.

Exercise 6. Choose one of the following topics for a presentation on how AI systems are used in practice:

1. Natural Language Processing (NLP) in Everyday Apps
2. Computer Vision and Autonomous Vehicles
3. Machine Learning in Banking and Fraud Detection
4. AI-Powered Robotics in Modern Manufacturing
5. Artificial Intelligence in Automated Healthcare and Diagnostic



SUPPLEMENTARY READING

Exercise 1. Before reading the text, answer the following questions:

- Where do you think natural language processing can be used?
- How complicated do you think NLP is and how does it operate?
- Do you think NLP is a brand-new technology of the 21st century, or does it have a longer history?

Exercise 2. Read the text below paying special attention to the following terms and their pronunciation.

Translate the text.

text acquisition [ˌækwɪˈzɪʃ(ə)n]

reduce computational power

named entities recognition

[ˈɛntɪtɪz ˌrekəɡˈnɪʃən]

case folding [keɪs ˈfəʊldɪŋ]

embedding techniques

[ɪmˈbedɪŋ tekˈniːks]

converts text into numerical vectors

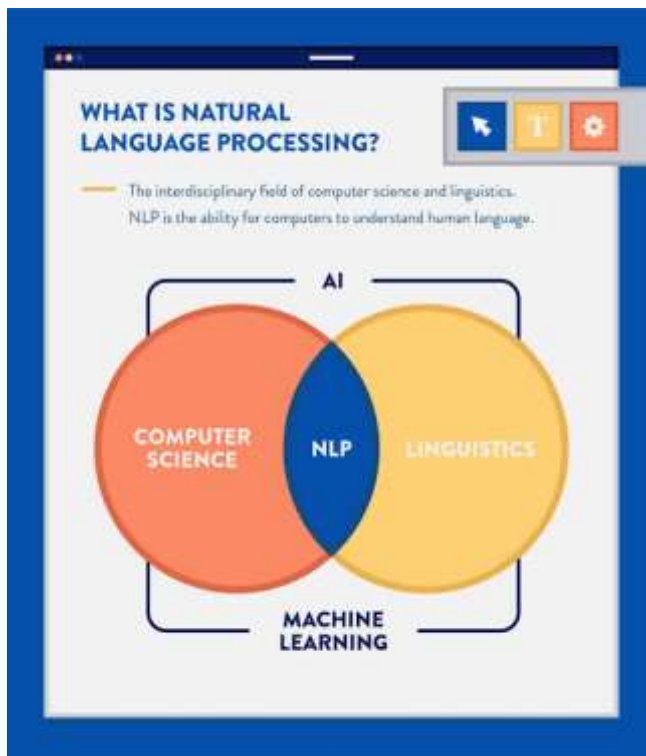
word embeddings

dense vector [dens ˈvektə]

contextual embeddings

[kənˈtekstʃuəl ɪmˈbedɪŋz]

fine-tune [ˌfaɪnˈtʃuːn]



сбор текстовых данных

снизить вычислительную нагрузку

распознавание именованных
сущностей

приведение к регистру

методы эмбединга

преобразовать текст в числовые
векторы

векторные представления слов

плотный вектор

контекстуализированные

эмбединги

осуществить точную настройку

How Natural Language Processing Works

Natural Language Processing (NLP) helps computers understand, interpret and produce human language. It studies language as data and develops a model that

can analyse linguistic structure, meaning and context in both written and spoken communication.

Simple Example of NLP: “Ravi is happy with the new phone.”

An NLP system can:

- detect Ravi as a person;
- identify phone as an object;
- recognize sentiment as positive;
- understand topic as product review.

1. Text or Speech Input

- The system takes written language like sentences or documents which is called text acquisition.
- When the input is audio, it is first converted into text using Speech Recognition.

2. Pre-processing

The text is cleaned and prepared. It can include:

- Cleaning unwanted characters or symbols from text is done using text normalization.
- Breaking sentences into smaller units so they can be processed easily.
- Changing all words into the same case for uniform processing is known as case folding.
- Eliminating frequent or common words like is, the, and to focus on meaningful terms.
- Converting words like running to run (base form) to reduce computational power.

3. Language Analysis

The system studies structure and meaning:

- Identifying nouns, verbs, and other parts of speech in a sentence.
- Finding how words connect to each other in a sentence.
- Determining the actual meaning of a word based on surrounding text.

- Detecting entities like person names, locations, or dates (named entities recognition).
- Identifying whether text expresses positive, negative or neutral emotion.

4. Text Representation and Embedding Techniques

Since machines process numbers, this stage converts text into numerical vectors.

- Text representation: In this step, text is converted into numbers using statistical features or vector representations so machines can process it.
- Traditional representations: Earlier methods represent text using word counts and importance scores.
- Word embeddings: Modern methods represent words as dense vectors capturing similarity and meaning.
- Contextual embeddings: Advanced models generate word meanings based on the surrounding sentence.

5. Model Training

Once text is numeric, models are trained to learn patterns and perform NLP tasks.

- After text is converted into vectors, algorithms learn patterns from data to perform tasks like classification or translation.
- Earlier NLP systems relied on statistical algorithms that learn from manually prepared features.
- Modern NLP uses neural networks that automatically learn language structure from large data.
- Large language models trained on massive datasets can be reused and fine-tuned for tasks.

6. Output Generation

The system produces results such as:

- text reply;
- voice response;
- translation;

- summary;
- prediction.

Exercise 3. Answer the following questions:

- Have you learnt something new or surprising from the text? Share this information with the group.
- What do you think is the difference between a formal language and a natural language?
- In your own words, briefly summarize the main stages of NLP described in the text.

Exercise 4. Choose the correct word from the options in brackets to complete each sentence.

1. NLP studies language as data and develops a _____ that can analyse linguistic structure. (model / machine / text)
2. Breaking sentences into smaller _____ helps process them more easily. (vectors / units / counts)
3. Changing all words into the same case for uniform processing is known as case _____. (cleaning / normalized / folding)
4. Eliminating _____ words like "is", "the", and "and" helps to focus on meaningful terms. (frequent / modern / advanced)
5. Converting words like "running" to "run" reduces _____ power. (linguistic / statistical / computational)
6. Identifying nouns, verbs, and other parts of speech is a part of language _____. (analysis / acquisition / generation)
7. Determining the actual meaning of a word is based on _____ text. (surrounding / traditional / massive)
8. Detecting entities like person names, locations, or dates is called named _____ recognition. (emotion / entities / algorithms)

9. Sentiment analysis identifies whether text expresses positive, negative or _____ emotion. (neutral / numerical / contextual)
10. Since machines process numbers, text must be converted into numerical _____. (sentences / features / vectors)
11. Earlier methods represent text using word _____ and importance scores. (counts / models / networks)
12. Modern methods represent words as _____ vectors capturing similarity and meaning. (dense / simple / massive)
13. Advanced models generate word meanings based on the surrounding _____. (character / sentence / case)
14. Earlier NLP systems relied on statistical algorithms that learn from _____ prepared features. (manually / automatically / contextually)
15. Modern NLP uses neural _____ that automatically learn language structure from large data. (systems / networks / algorithms)

➤ SPEAKING

Choose one of the topics below. Find relevant information online and prepare a short (3-5 minute) presentation:

- **NLP History:** milestones and key breakthroughs.
- **Machine Translation Today:** how Google Translate or other systems actually work.
- **Speech Recognition:** challenges in understanding human voice (accents, slang, etc.).

UNIT 6. AI IN AGRICULTURE



➤ READING

Read and translate the text.

AI IN AGRICULTURE

Wow, look at that drone go! In the industry, we refer to them as Unmanned Aerial Vehicles, or UAVs, and today they've become absolutely essential tools in modern precision agriculture. But why do we actually need drones when we already have satellite images and classic ground inspections? The truth is, they bridge the gap between the two: satellites can be blurry or blocked by clouds, and walking the whole field takes forever. Drones, on the other hand, offer high-resolution, real-time data that helps farmers optimize their crop management instantly.

Take Multispectral Field Mapping, for example. How does that actually work? It's fascinating: these drones capture specialized light wavelengths to calculate the NDVI – the Normalized Difference Vegetation Index. Basically, it acts like an early warning system, revealing crop stress and chlorophyll levels long before the damage is even visible to the naked eye.

And what about those massive heavy-payload drones? They look like they mean business because they are used for precision aerial spraying. They apply liquid fertilizers and pesticides with millimeter accuracy, which reduces chemical waste

and, more importantly, prevents soil compaction because we don't have to drive heavy tractors through the mud.

Beyond spraying, they can also see the plants clearly through Crop Scouting and Counting. By using computer vision algorithms to analyze the drone footage, the software can count individual plants, locate specific weed patches, and estimate emergence rates – meaning it counts the actual shoots that broke through the soil surface. Can drones help with water management too? Yes, through Thermal Irrigation Auditing. Drones equipped with infrared sensors map surface temperatures across the field, so if a spot is too hot, it helps us identify clogged irrigation nozzles, leaks, or drought-stressed zones immediately. It turns out a drone isn't just a flying camera; it's a complete diagnostic lab in the sky. Welcome to the future of farming!

However, the revolution does not stop in the air. Artificial intelligence is changing ground work too. Today, smart tractors drive themselves and robotic harvesters use AI to find ripe fruits and pick them carefully. Special AI programs check old weather records and soil data to predict harvests and tell farmers the best dates to plant seeds. In animal farming, special cameras and sensors check if animals are healthy or sick in real time. AI also helps sell and move food better by predicting what people want to buy, which helps reduce food waste. Finally, in factories, AI systems quickly check food quality and remove bad produce.

At the same time, these new technologies also bring big problems. First, AI systems are very expensive, so small farmers cannot buy them and might lose their businesses to big companies. Second, because these smart machines use the Internet, hackers can attack them and stop the work, which can cause food shortages. Third, big tech companies now own important data about national farming. Also, if farmers trust computers too much, they might forget traditional farming skills.

Finally, since machines do the work, many people in rural areas will lose their jobs. These integrated technologies ensure that today's farms are truly intelligent ecosystems, but their success will ultimately depend on how responsibly we manage these emerging threats.

➤ VOCABULARY

1. refer [rɪ 'fɜːr] to smth as	называть что-либо как-либо
2. blurry ['blɜːri]	нечеткий, мутный
3. capture ['kæptʃər] specialized light wavelengths	фиксировать световые волны в определенных диапазонах
4. visible ['vɪzəbl] to the naked eye	видимый невооруженным глазом
5. early warning system	система раннего оповещения
6. mean business	иметь серьезные намерения (<i>идиома</i>)
7. liquid fertilizers ['lɪkwɪd 'fɜːtəlaɪzəz]	жидкие удобрения
8. chemical waste [weɪst]	химические отходы
9. reduce[rɪ 'dʒuːs]	уменьшать, сокращать
10. prevent [prɪ 'vent]	Предотвращать
11. estimate ['estɪmeɪt]	Оценивать
12. analyse the drone footage	анализировать данные аэросъемки
13. equipped [ɪ 'kwɪpt] with	Оснащенный
14. It turns out (that)	Оказывается, что...
15. Unmanned Aerial Vehicles [ˌʌn.mænd ,eə.ri.əl 'vi.ə.kəlz] (UAVs)	беспилотные летательные аппараты (БПЛА)
16. precision agriculture [prɪ 'sɪʒ.ən 'æɡ.rɪ.kəl.tʃə]	точное земледелие
17. Multispectral Field Mapping	мультиспектральное картографирование полей
18. Normalized Difference Vegetation Index (NDVI)	нормализованный относительный индекс растительности (индекс NDVI)
19. crop stress	стресс сельскохозяйственных культур
20. Precision Aerial Spraying	точечное (прецизионное) авиаопрыскивание
21. heavy-payload drones	тяжелые грузоподъемные дроны
22. soil compaction	уплотнение почвы
23. Crop Scouting and Counting	сканирование (мониторинг) и подсчет посевов
24. emergence rates	процент появления всходов
25. Thermal Irrigation Auditing	тепловой аудит (инспекция) систем полива и орошения
26. infrared sensors	инфракрасные датчики
27. clogged irrigation nozzles [klɒgd	забившиеся / засорившиеся сопла

,iri'geɪfn 'nɒzlz]

поливных систем

28. leaks

утечки / протечки

29. drought-stressed zones [draʊt-strest
zəʊnz]

зоны засушливого стресса растений
(участки поля, где посевы страдают от
нехватки влаги)

➤ COMPREHENSION CHECK

Exercise 1. Answer the questions based on the text.

1. Why are drones preferred over satellites for precision agriculture?

- a. Drones are cheaper to operate than ground inspections.
- b. Drones can fly inside heavy-payload farm buildings.
- c. Drones provide high-resolution, real-time data without being blocked by clouds.
- d. Drones do not require an AI backend or software algorithms to function.

2. What is the main benefit of using heavy-payload drones for aerial spraying?

- a. They allow farmers to count individual shoots that broke through the soil.
- b. They map surface temperatures to find leaks in irrigation nozzles.
- c. They prevent soil compaction by avoiding the use of heavy tractors in the mud.
- d. They automatically remove bad produce from processing facilities.

3. How does AI assist farmers specifically in animal farming?

- a. It uses computer vision algorithms to map weed patches in fields.
- b. It tracks market demand to help move and sell products faster.
- c. It uses cameras and sensors to check animal health in real time.
- d. It analyzes old weather records to protect animals from storms.

4. What is one of the cybersecurity risks associated with smart farming?

- a. Hackers can steal traditional farming skills from experienced workers.
- b. Attacks on internet-connected machines could stop work and cause food shortages.
- c. Large tech corporations might sell national farming data to smallholders.
- d. Autonomous tractors might crash due to bad weather records.

5. What long-term social and cultural risk of over-relying on AI are mentioned?

- a. AI systems will become too cheap, causing tech companies to lose money.

- b. Farmers might lose their traditional farming wisdom and knowledge.
- c. Factories will stop checking food quality due to computer errors.
- d. Drones will completely replace internet networks in rural areas.

Exercise 2. Make up questions based on the text.

1. **What** _____?
2. **How** _____?
3. **Why** _____?
4. **Which** _____?
5. **Where** _____?
6. **When** _____?
7. **Who** _____?
8. **Whose** _____?
9. **How much** _____?
10. **How many** _____?

Exercise 3. Work with a partner. Ask each other questions from exercise 2 and answer them.

Exercise 4. Match each word with its definition.

- | | |
|----------------------|--|
| 1. estimate | a. not clear, sharp, or easy to see |
| 2. footage | b. show something that was hidden or unknown before |
| 3. surface | c. a substance that flows freely like water, not solid or gas |
| 4. inspection | d. guess or calculate the approximate value, number, or size of something without measuring it exactly |
| 5. reveal | e. the act of looking at something closely and carefully to check its condition or quality |
| 6. liquid | f. record or take a picture, video, or data using a camera, sensor, or computer |
| 7. blurry | g. the top or outer layer of something |

- | | |
|----------------------|--|
| 8. internship | h. material or resources that are not needed and are thrown away, or using something carelessly |
| 9. capture | i. a piece of film or video that records a specific event or place |
| 10. waste | j. a period of time when a student or a new graduate works at a company to get practical experience |

Exercise 5. Summarize the main idea of the text in 6-8 sentences and express your attitude to the topic which is touched upon in it.

➤ EXERCISES

Exercise 1. Give synonyms and antonyms to the following words:

Give **synonyms** to the following Give **antonyms** to the following words:
words:

- | | |
|------------------|----------------|
| 1. official | a. modern |
| 2. essential | b. massive |
| 3. modern | c. blurry |
| 4. massive | d. essential |
| 5. blurry | e. official |
| 6. inspection | f. to reduce |
| 7. optimise | g. specific |
| 8. to reveal | h. complete |
| 9. to reduce | i. to take off |
| 10. to calculate | j. drought |

Exercise 2. Give English equivalents to the following phrases:

1. иметь серьезные намерения

2. уменьшать химические отходы
3. считать отдельные растения
4. анализировать данные фотосъемки
5. тяжелые грузоподъемные дроны
6. видимый невооруженным глазом
7. система раннего оповещения
8. данные в реальном времени с высоким разрешением
9. мультиспектральное картографирование
10. точечное автоопрыскивание
11. оснащенный инфракрасными датчиками
12. применять жидкие удобрения
13. изучать архивные метеоданные
14. приводить к дефициту продовольствия
15. контролировать возникающие риски (угрозы)

Exercise 3. Choose the appropriate preposition from the box to put in the blanks. Some prepositions can be used more than once.

in; on; between; by; with; through; to; at; behind

1. People _____ the industry usually refer _____ these machines as Unmanned Aerial Vehicles.
2. Agricultural drones have become absolutely essential tools _____ modern precision farming.
3. Drones are very useful because they can easily bridge the gap _____ satellites and ground inspections.
4. Sometimes satellite images are not clear because they are blocked _____ thick clouds.
5. Drones capture specialized light wavelengths to calculate the index long before the damage is visible _____ the naked eye.

6. Heavy-payload drones are widely used _____ precision aerial spraying on large fields.
7. Advanced smart systems can apply liquid fertilizers and pesticides _____ millimeter accuracy.
8. With drones, farmers do not have to drive heavy, expensive tractors _____ the mud.
9. Engineers use modern computer vision algorithms to analyze the data _____ the drone footage.
10. The software counts the actual shoots that broke _____ the soil surface during the spring.
11. Drones equipped _____ infrared sensors can easily map surface temperatures across the area.
12. A smart drone turns out to be a complete and fully automated diagnostic lab _____ the sky.
13. Small farmers cannot buy expensive AI systems and might lose their businesses _____ big companies.
14. Smart machines depend _____ the Internet, so hackers can attack them and stop the work.

Exercise 4. Fill in the blanks with the appropriate vocabulary words from the box. NB: One phrase will not be used.

WORD BANK

blurry / capture / crop scouting / emergence rates / estimate / footage / inspection / internship / liquid / precision agriculture / reveal / surface / waste

1. Modern software uses computer vision to _____ the exact number of plants in the field without manual counting.
2. Satellites are useful, but their images can be _____ or completely blocked when the weather is cloudy.

3. The heavy-payload drone carries _____ fertilizers and sprays them with millimeter accuracy.
4. Using drones helps farmers protect the environment because it significantly reduces chemical _____.
5. The software can calculate _____ by counting the actual young shoots that broke through the soil.
6. Infrared sensors map temperatures across the field to _____ hidden problems like leaks or clogged nozzles.
7. Walking around a massive field for a manual ground _____ takes too much time and energy.
8. These smart drones can _____ specialized light wavelengths that the human eye cannot see.
9. Technicians analyze the recorded drone _____ to locate specific patches of weeds.
10. The main goal of _____ is to use real-time data to optimize crop management instantly.
11. Thermal auditing helps find drought-stressed zones by measuring the temperature of the ground _____.
12. Using automated cameras for _____ and counting allows farmers to monitor their plants clearly every day.

➤ SPEAKING

Exercise 1. Make a dialogue with your partner and discuss how Artificial Intelligence can be used in agriculture.

Exercise 2. Search online for reports from agricultural companies that have implemented AI-driven machinery. What results have they already achieved, or what outcomes do they hope to obtain in the near future?

Exercise 3. Choose one of the topics below for a short presentation. Explain how this technology works and why it helps modern farmers.

1. Drones vs. Satellites in Precision Agriculture
2. The Use of Heavy-Payload Drones for Precision Spraying
3. Thermal Irrigation Auditing and Water Management in Farming

Exercise 4. Express your agreement or disagreement with the given information. What about the downsides of AI in farming? Justify your opinion in 5-8 sentences.

Many people admire AI-driven machinery and drones, but this technology also has serious problems. First, high-tech tools are very expensive to buy and repair, so small farming companies cannot afford them. Second, if the software makes a mistake or has a system glitch, the model can wrongly estimate crop health and destroy the whole harvest. Finally, using autonomous tractors and drones creates dangerous cybersecurity risks because hackers can attack and control the equipment online.

Exercise 5. Choose one of the following topics for a short presentation on how AI may be used in agriculture and farming. Use at least 5 words or phrases from the Unit vocabulary.

1. Precision irrigation and saving water in farming.
2. Computer vision for pest and disease detection.
3. Autonomous machinery and cybersecurity risks in agriculture.
4. Potential risks of using AI in agriculture.

Exercise 6. Imagine you are the head of a mid-sized agricultural company. You need to persuade your investors to purchase two AI-driven drones for the upcoming season. Describe the practical benefits you expect to get with the new equipment and explain how it will save the company's budget.

UNIT 7. EDUCATION IN IT



➤ READING

Read and translate the text

EDUCATION IN COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

Education in Computer Science and Information Technology prepares students for careers in a wide variety of jobs related to computing, programming, and data manipulation. Studying CS and IT is prestigious because these are among the fastest growing scientific fields. Graduate programmers and IT specialists tend to find jobs with ease, as computers have become an integral part of all sectors of the economy. When choosing a country of study and educational institution, it is worth paying special attention to the development of information technologies in the state, as well as to the success of graduates and the reputation of universities.

Specialty description

IT refers to the use of computers for any kind of manipulating information, managing networks, telecommunications, information systems, and databases. Computer science, in turn, is closely related to mathematics, computation theory, programming, computer engineering, electronics, robotics and other engineering electives. These are in many ways similar, but basically IT is considered to be a more general field, while CS turns to more specific concepts. Another difference is that CS

deals with developing applications, whereas IT focuses on using those apps for solving problems, mostly business ones.

A programmer is one of the job options which is commonly used for both IT and CS professionals. That is a specialist who creates software and applications. Although IT specialists usually have basic programming knowledge, programmers actually belong to the Computer Science field.

Representatives of IT and CS have a wide range of specializations: data analytics, cybersecurity, software development, application development, video games development, web development, etc. Web developers work with computing and coding in programming languages and platforms including *SQL, Python, Perl, Ruby, XML, PHP, HTML, C, C#, C++, and Java*.

Both computer scientists and IT professionals play an important role in the development of computer technology.

Who is a programmer?

A programmer is a specialist who writes and tests code for software. A more general term is a computer scientist, but still the term "programmer" can be used to refer to a software developer, software engineer, computer specialist, software analyst, etc.

The responsibilities of a programmer usually include: developing software and applications using various computer languages (such as *C++, Java, Python etc.*), creating and improving operating systems (*iOS, Android, Windows, Linux*), developing websites, updating and expanding existing software, checking programs for bugs and fixing corrupt lines of computer code, creating and testing code in an integrated development environment (IDE), maintenance, network architecture.

When looking for a job, you can find vacancies by languages that programmers work with (C++ programmer, Java programmer PHP programmer), by type of task (web-programmer, front-end / back-end developer), and by the level of experience/position (intern, junior, medium, senior).

Advantages of the profession

Creative space and tangible results. The ability to write code opens an endless field of possibilities. Programmers create applications and programs and automate various tasks. They simplify and speed up processes for users, solve almost any problem, and subsequently make life easier for people. The programmer can create something of their own, thereby helping others.

Remote work. Since a programmer only needs a computer to work, such specialists are usually not tied to a specific location. The Internet connects it with other users and the cloud storage databases. It should be noted, however, that remote work does not suit all workers and employers.

Continuous development. Technology is changing rapidly. IT also does not stand still, for example, new programming languages appear. For IT professionals, there is a large selection of courses and programs dedicated to specific topics and innovations or advanced training. However, there is a downside to this. Programmers are forced to learn something new every day and keep up with the times, otherwise, there is a risk of becoming a non-demanded specialist with outdated knowledge.

High salaries. Programmers are in demand in many countries, and therefore their work is highly paid. For example, the salary for the entry-level position in the USA can be as high as 5,875 USD/month.

Disadvantages of the profession

Impact on health. All day programmers work indoors in front of the computer. For hours in a row, they knock on their keyboard, click mouse buttons, and stare at the screen. Such motionless work can lead to muscle and bone pains, eye strain, and subsequently to other chronic diseases. An ergonomic chair, wrist cushions, and regular exercise throughout the day can help mitigate some of the negative health side effects, but offsetting all the risks associated with sedentary work is difficult.

Exhausting work. Programmers are constantly engaged in mental work, and in their free time, they are forced to learn new things. Also, IT specialists often crunch a lot. A software engineer Edward Yourdon even came up with the concept of ‘Death

March'. The term refers to a project that is too complex, doomed to failure, or requiring the doubling of work hours to complete it. For example, a 40-hour week becomes an 80-hour week. Such workloads can last for weeks or even months, which cannot but affect the personal life, the physical and mental health of the programmer.

High competition. With all the advantages of a job, namely high salaries and demand, many are striving to get it. What makes the competition even more fierce is the remote work format and globalized world. Programmers from developing countries work just as well, sometimes even better than local specialists, and their work is often cheaper, which attracts many employers.

IT specializations

There are a lot of specializations in IT. When choosing a direction follow your interests, since each specialization has its own characteristics. For example, if you like applied design, then robotics is suitable for studying, but if you fancy computational problems, then fundamental informatics is your choice. Popular areas in universities are Computer Science and Software Engineering. Computer science is a general and diverse field of study that has various branches (artificial intelligence, computer systems and networks, security). Also, such specialization as Data Science is gaining momentum. It implies work with statistics and mathematics.

Among the promising areas for the future are computer security and artificial intelligence.

Cybersecurity. With the introduction of technology in all spheres of human life: from buying groceries to managing the state, more and more hackers and cyber terrorists appear. They harm both individuals and government agencies and large companies. Therefore, in the modern world, data protection is not a luxury, but a vital necessity. To defend against cyberattacks and security breaches, leading organizations are willing to pay big sums to cyber analysts. The U.S. Bureau of Labor Statistics predicts that cybersecurity jobs will grow 28% from 2016 to 2026 — much faster when compared to the average growth of the other professions.

Artificial Intelligence (AI) is one of the most controversial and intriguing areas in computer science. AI is still in its early stages of development, but tech

giants like *Google* and *IBM* are already investing huge amounts of money and resources into AI research. The global robotics industry is expected to be worth 80 billion USD by 2024. The field of study is promising and could completely change the world. However, artificial intelligence has both benefits and potential risks. Apart from the doomsday scenario, AI, for example, can optimize tasks and reduce human error, but at the same time lead to the automatization of labor, and therefore to the disappearance of jobs.

➤ VOCABULARY

1. Computer Science [kəm'pjʊ:tə 'saɪəns]	компьютерные науки, информатика
2. Information Technology (IT) [ˌɪnfə'meɪʃn tek'nɒlədʒi]	информационные технологии
3. educational institution [ɛdʒu'keɪʃnəl ˌɪnstɪ'tjuːʃən]	образовательное учреждение
4. computing [kəm'pjʊ:tɪŋ]	вычисления; работа с компьютерами
5. programming ['prəʊgræmɪŋ]	программирование
6. data manipulation ['deɪtə məˌnɪpjʊ'leɪʃn]	обработка (манипуляция) данными
7. network ['netwɜ:k]	сеть
8. telecommunications [ˌtelɪkəˌmjuːnɪ'keɪʃnz]	телекоммуникации, средства связи
9. database ['deɪtəbeɪs]	база данных
10. computation theory [ˌkɒmpju'teɪʃn 'θɪəri]	теория вычислений
11. computer engineering [kəm'pjʊ:tər ˌendʒɪ'nɪərɪŋ]	компьютерная инженерия
12. software ['sɒftweə]	программное обеспечение
13. application (app) [ˌæplɪ'keɪʃn]	приложение
14. programmer ['prəʊgræmə]	программист
15. code [kəʊd]	код
16. software developer ['sɒftweə dɪ'veləpə]	разработчик программного обеспечения
17. software engineer ['sɒftweə ˌendʒɪ'nɪə]	инженер-программист
18. operating system ['ɒpəreɪtɪŋ 'sɪstəm]	операционная система

19. bug [bʌg]	ошибка (в программе), баг
20. debugging [ˌdiːˈbʌɡɪŋ]	отладка, исправление ошибок
21. integrated development environment (IDE) [ˈɪntɪɡreɪtɪd dɪˈveləpmənt ɪnˈvaɪərənmənt]	интегрированная среда разработки
22. front-end developer [ˌfrʌntˈend dɪˈveləpə]	фронтенд-разработчик
23. back-end developer [ˌbækˈend dɪˈveləpə]	бэкенд-разработчик
24. artificial intelligence (AI) [ˌɑːtrɪˈfɪʃl ɪnˈtelɪdʒəns]	искусственный интеллект
25. cybersecurity [ˌsaɪbəsrɪˈkjʊərəti]	кибербезопасность
26. robotics [rəʊˈbɒtɪks]	робототехника

➤ COMPREHENSION CHECK

Exercise 1. Say whether these statements are True or False. Correct the false ones.

1. Education in Computer Science and IT prepares students for careers related to computing, programming, and data manipulation.
2. IT is considered to be a more specific field, while CS is a more general one.
3. A programmer is a specialist who creates software and applications.
4. Web developers work only with Python and Java.
5. A programmer can be referred to as a software developer, software engineer, or software analyst.
6. Remote work suits absolutely all workers and employers.
7. Technology is changing rapidly, so programmers are forced to learn something new every day.
8. Programmers rarely work in front of the computer during the day.
9. The concept of "Death March" was introduced by Edward Yourdon.
10. Cybersecurity jobs are predicted to grow slower than the average growth of other professions.

Exercise 2. Answer the following questions based on the text:

1. What does IT refer to?
2. What is the main difference between CS and IT?
3. Who is a programmer and what do they do?
4. Name three responsibilities of a programmer.
5. What are the advantages of the programming profession? Name at least three.
6. Why is continuous development both an advantage and a disadvantage?
7. What health problems can programmers face?
8. What is "Death March" and who introduced this concept?
9. Why is competition in IT so fierce?
10. Which IT specializations are considered promising for the future?

Exercise 3. Summarize the main idea of the text in 8-10 sentences using your answers in exercise 2 as guidelines.

➤ VOCABULARY EXERCISES

Exercise 1. Fill in the blanks with the best word from the bank:

WORD BANK:

*data manipulation, prestigious, integral, bugs, IDE, remotely, outdated,
mental, competition, hardware*

1. Studying CS and IT is _____ because these are among the fastest growing scientific fields.
2. Computers have become an _____ part of all sectors of the economy.
3. Education in IT prepares students for jobs related to computing, programming, and _____.
4. Programmers check programs for _____ and fix corrupt lines of computer code.
5. Programmers create and test code in an integrated development environment, or _____.

6. Since a programmer only needs a computer to work, such specialists are usually not tied to a specific location — they can work _____.
7. There is a risk of becoming a non-demanded specialist with _____ knowledge.
8. Programmers are constantly engaged in _____ work, and in their free time they are forced to learn new things.
9. What makes the _____ even more fierce is the remote work format and globalized world.
10. Programmers often "crunch" a lot, meaning they work very long hours to finish a project.

Exercise 2. Match the words with their definitions:

- | | |
|-----------------------------|---|
| 1. IT | A. A specialist who writes and tests code for software. |
| 2. Computer Science | |
| 3. Programmer | B. A field dealing with developing applications, closely related to mathematics and computation theory. |
| 4. Database | |
| 5. Bug | |
| 6. Operating system | C. The use of computers for manipulating information, managing networks, telecommunications, information systems. |
| 7. Front-end developer | |
| 8. Cybersecurity | D. Protection of data from hackers, cyber terrorists and security breaches. |
| 9. Robotics | |
| 10. Artificial Intelligence | E. An error or mistake in a computer program. |
| | F. A specialist who works on the part of a website or app that users see and interact with. |
| | G. A structured collection of data stored electronically. |

H. Software that manages a computer's basic functions (iOS, Android, Windows, Linux).

I. The field of study connected with designing and building robots.

J. A field of computer science that can optimize tasks and reduce human error, but may lead to job losses.

Exercise 3. Choose the correct word

1. A programmer is a specialist who writes and **tests** / **sells** code for software.
2. CS deals with **developing** / **destroying** applications.
3. IT focuses on using apps for solving problems, mostly **business** / **agricultural** ones.
4. Programmers develop websites and create and improve **operating systems** / **operating tables**.
5. Vacancies can be found by the level of experience: intern, junior, **medium** / **medium-rare**, senior.
6. An **ergonomic** / **energetic** chair and wrist cushions can help mitigate health side effects.
7. "Death March" refers to a project that is too complex or doomed to **failure** / **success**.
8. AI can optimize tasks and reduce human **error** / **labour**.
9. The global **robotics** / **information** industry is expected to be worth 80 billion USD by 2024.
10. Programmers from developing countries sometimes work even better than **local** / **foreign** specialists.

Exercise 4. Form the required part of speech from the word in parentheses:

1. CS and IT prepare students for careers in a wide variety of jobs related to _____ (COMPUTE).
2. Programming is one of the fastest growing _____ (SCIENCE) fields.
3. A programmer creates software and _____ (APPLY).
4. Both computer scientists and IT professionals play an important role in the _____ (DEVELOP) of computer technology.
5. An IT specialist must constantly keep up with _____ (INNOVATE).
6. Such motionless work can lead to muscle and bone pains and eye _____ (STRAIN).
7. AI can lead to the _____ (AUTOMATIC) of labour.
8. Cybersecurity is a _____ (PROMISE) area for the future.
9. Data protection is not a luxury but a vital _____ (NECESSARY).
10. High _____ (COMPETE) makes it difficult to get a job in IT.

➤ SUPPLEMENTARY READING**Exercise 1. Before reading the text, answer the following questions:**

1. What does a person need to become a successful programmer?
2. What additional skills are required in this profession?
3. Do you know any famous IT specialists? How did they become famous?

Exercise 2. Read and translate the text**HOW TO BECOME A PROGRAMMER?**

You don't necessarily need an education to become a programmer, especially when you consider the fact that the IT sphere is developing at the speed of light and traditional universities and colleges struggle to keep up with the innovations of science. However, experienced specialists still insist on obtaining higher or at least secondary vocational education. It will take much more time and effort to master the

IT field on your own than in a university that already has a developed curriculum, a training system, incentives in the form of grades and mentors who know their subject. If, after all, your choice is a self-study, then you need to be patient and persistent. It is important to read professional literature, attend courses, and practice a lot. However, one should not hope for high engineering and research positions — they require higher education. After school or college, it is quite possible to start from the position of a simple developer, keep learning, and subsequently become a good specialist.

Specialties in colleges are different, for example, computer networks, network and system administration, information systems, and programming. The admission happens on a competition basis. Students are trained during their studies and after graduation can immediately find a job. Further, much depends on the specialist himself: continuous self-education will provide a professional with good job offers and high earnings.

Depending on the country of study you can have a variety of options when it comes to vocational education. For example, community colleges in the US have programs in computer science, data management, and more, as well as short courses. After graduating from a college in the United States, you can go to university to obtain a bachelor's degree or start working. TAFE colleges in Australia offer many different IT programs. For example, website/software development, digital media technology, web technology, information networking technology, programming. Generally, post-college qualifications are a certificate and an associate's degree. Similar programs can be found in vocational schools and institutes in Germany and France.

University studies for a programmer

Universities provide students with a better knowledge base than colleges. University programs are more extensive, and the number of experienced teachers in universities is greater. Programs offered by universities are applied mathematics, computer science, fundamental computer science and information technology, computer science and computing, applied computer science, software engineering.

The subjects taught are, as a rule, the following: the basics of programming, computer networks, computer graphics, programming languages, information theory and machine learning, mathematical analysis, algebra and geometry, software engineering, intelligent systems, modern information systems, etc. Also, students undergo practical training during their studies.

Where do programmers work?

Programmers can work in any industry that uses applications, software, sites, and the Internet. Many seek to get into large tech companies, for example, *Google, Apple, Samsung, Yandex, Amazon, Microsoft*.

Most IT professionals work in a traditional office. However, their work can often be done remotely, which is why some employers allow their programmers to work from home.

There is a possibility that in the future quantum computers will replace the current — binary ones. If binary computers operate with bits, then quantum ones operate with qubits. They are much more powerful and more complex than those familiar to the average PC. The capabilities of a quantum computer could open up entirely new areas of study and work. However, such computers are still at an early stage of development and do not have well-established programming languages.

In many developing countries, programmers tend to go to work abroad. This is largely due to low salaries, a stagnant corporate culture, and limited free space, namely, the unwillingness to create something new and adherence to familiar techniques. Programming is a promising and growing industry in which the field for discovery and innovation is endless. However, not all companies create favorable and comfortable conditions for employees, as a result of which they not only lose talented personnel and stop improving their product but also impede the development of the industry in the country as a whole.

Famous programmers

Satoshi Nakamoto is a mysterious figure in the programming world. It is still unknown who is hiding under this name: a person or a group of people. It is only known that Nakamoto wrote the Bitcoin White Paper and created the first blockchain

database. Nakamoto was also the first to solve the double-spending problem for digital currency with a peer-to-peer network. The mysterious programmer was actively involved in bitcoin development until mid-2010, but no longer works on it.

There are various theories about who Nakamoto is or was. Experts find Easter eggs in his messages and study Nakamoto's speech from a linguistic point of view to understand if the developer is Japanese or not, but they still cannot come to a definitive answer. What is clear is that Nakamoto has forever influenced financial transactions, and bitcoin itself continues to be the world's leading digital currency.



Ada Lovelace



Evelyn Boyd Granville

Ada Lovelace is an English mathematician, writer, and the world's first computer programmer. The daughter of the famous poet Byron was born in 1815 in London. Lovelace created a description of a computing machine and wrote the world's first program. The "mother of all programmers" coined terms like "loop" and "work cell". She was many years ahead of her time and had a huge impact on the history of computers.

Evelyn Boyd Granville was the second African American to earn a PhD in mathematics from the American University. Granville began her career as a teaching position at Fisk University, and then joined the American Space Technology Laboratories, where she assisted in US space missions, studying rocket trajectories and orbit calculations. While working at IBM she developed software that analyzed satellite orbits for NASA programs. In 1967 she returned to teaching and kept pushing the interest of women studying technology for the rest of her career.

➤ SPEAKING

Exercise 1. University vs. College: Mini-Debate (Groups of 5-6) Argumentation, agreeing and disagreeing, time 12–15 min.

1. Divide the group into two teams: "University supporters" and "College + self-education supporters".
2. Give 3 minutes to prepare three arguments each, using the text (programmes, subjects, teachers, practical training, salaries, job offers).
3. Each side presents 1.5 minutes; then a short cross-questioning round.
4. The class votes for the most convincing team.

Role cards:

- Team A: "Universities give a better knowledge base, more extensive programmes and more experienced teachers."
- Team B: "Colleges are faster and more practical — you can start working immediately and keep learning on the job."

Exercise 2. "Where Do Programmers Work?": Job Interview Role Play.

Student A is an HR manager at a large tech company (Google, Amazon, Yandex...); Student B is a junior developer applying for a job. The interviewer must cover:

- Where programmers usually work (office / remote work).
- Which companies and industries hire IT specialists.
- What the future of the profession is: will quantum computers replace binary ones? What does this mean for programmers?
- Why specialists in some countries prefer to work abroad, and what makes them stay.
- What will the job of a programmer look like in 20 years?

Exercise 3. Using the Internet find information about any famous programmer. Prepare a short presentation and share the results of your research with your groupmates.

UNIT 8. THE FUTURE OF IT



➤ READING

Read and translate the text

THE FUTURE OF IT: TRENDS THAT WILL SHAPE THE TOMORROW

IT helps drive the technology sector, and that is what is shaping our digital world. It includes tools, systems, and processes we use to handle information. In 2022, the global IT market hit a record \$9.48 trillion, and this growth is setting the stage for an exciting future.

So, the future holds lots of possibilities for IT. But the one question is: how will trends and transformative tech shape tomorrow?

Artificial intelligence (AI)

Artificial Intelligence is the brain for computers. That is to say, it helps them learn from data. However, the global AI market has grown from \$5.3 billion in 2013 to a staggering \$207.9 billion now, and this shows that there has been significant growth over the past decade.

Before now, we knew AI to only be able to handle basic tasks like calculations and pattern recognition. Now, it is able to handle more complex tasks like speech and image recognition. Businesses now make use of AI in chatbots for quick customer

service and data analysis to make better decisions. In the future, AI will become an integral part of almost every job.

Looking ahead, AI will probably be more ingrained in our daily lives. That is, it will likely reshape work and comm. It is expected to boost local economies, with China leading the way, and contribute trillions globally by 2030. However, this transition may replace millions of jobs. So, it will necessitate a balance between AI's benefits and potential challenges.

Future of AI

AI has already changed how we work and communicate. Today, about 32.9% businesses already use it, applying AI in data analysis and customer support.

However, this shift has its challenges. By 2025, many jobs may be replaced (such as those in transportation and manual labor). But there's still hope, with hundreds of new jobs expected in AI development and data science. Still, there are concerns about intelligent robots replacing a large portion of the global workforce by 2030. Consequently, this shows the need to carefully balance AI's advantages and potential drawbacks.

Cloud computing

Cloud computing means using the Internet to store data instead of your computer's hard drive. The technology can help you save money – you don't need to buy and maintain lots of hardware anymore. For example, instead of having their own servers, a company can use cloud services like Amazon Web Services or Microsoft Azure. They only pay for what they use and don't have to worry about upgrading or fixing servers. It's also more efficient because they can easily scale up or down depending on their needs. However, sometimes there can be challenges like security issues or downtime if the internet goes down.

With the growth of data and cybersecurity threats, end-to-end security solutions are becoming an important area of cloud technology development. The introduction of artificial intelligence (AI) and machine learning (MOD) for data analysis provides better detection and prevention of cyber attacks. In addition, data

encryption and access control technologies are being developed to ensure reliable information protection.

Also, there is a growing interest in developing quantum computing resources and providing them in the form of cloud services. This opens up new perspectives for solving complex problems in the field of science, finance and research.

Advanced cybersecurity measures

Advanced cybersecurity measures are when you use robust techniques to protect computers and data from cybercriminals. It is just the same as upgrading from a simple lock on your door to a high-tech fingerprint lock to enhance security.

Modern technologies like firewalls and antivirus programs help prevent harmful software from infiltrating systems. Also, encryption is used to keep information secure. In businesses, regular security checks and tools like multi-factor authentication are what help add layers of protection, making sure that everything stays safe in the digital sector.

Future of cybersecurity

Cybersecurity development is very important, especially with threats like crypto crime, which is projected to cost the world \$30 billion by 2025. That is nearly double the losses from 2021. What the whole world has spent on employee security awareness training is expected to be more than \$10 billion by 2027. So, this shows how important cybersecurity is.

Internet of things (IoT)

Internet of Things (IoT) means that physical devices (such as refrigerators or lights) are connected to the internet, allowing users to control them remotely.

The IoT market has recently seen substantial growth. For people, IoT simplifies daily routine. For businesses, it helps track assets like delivery trucks and monitor machinery. The future of IoT looks promising, and it seems that soon we will see it in almost every area of our lives.

Future of the internet of things (IoT)

Grandview Research anticipates significant growth in the IoT market by 2030. While this expansion promises a rise in the popularity of smart homes, cities, and industries, there are still some cybersecurity concerns.

Blockchain technology

Blockchain technology is a super-secure digital ledger. Instead of the records being kept at one central location, they are kept in a chain of connected computers or nodes working together. Each block in the chain contains a list of transactions, and they're all linked with a unique code. Once a block is filled, it's sealed, and a new one starts.

Future of blockchain

In the future, blockchain is going to change various sectors. One application is in blockchain voting systems, where blockchain ensures secure, transparent, and tamper-resistant elections. It'll also help with things like tracking money, keeping medical records secure, and even making sure products are genuine. Imagine it like a super-powered digital notepad that everyone can see but no one can change.

However, there will also be challenges such as the need for making this technology work fast while many people are using it at once. Also, security issues may also appear since hackers might try to break in and steal information or mess with the records.

5G

5G is the new mobile communication technology, improving data speeds with minimal delay and high security. It is transforming industries like healthcare and smart cities, making everything faster, smoother, and future-ready. For example, 5G enables quick and secure medical data sharing for remote surgeries and telemedicine in healthcare. For smart cities, it enhances connectivity for efficient traffic management, smart utilities, and real-time data exchange, making urban living more sustainable and responsive.

Before, we had 1G with analog phones. Then came 2G, bringing text messages and more efficiency. 3G came later, giving us faster Internet on mobiles. 4G made

things even speedier and more reliable, paving the way for remarkable technologies like IoT. Now, 5G is the star, super-fast at 10Gbps, low delay (significant for businesses as things can be done without delays), super secure, and able to handle many devices. It is very prominent in industries like virtual reality, healthcare, and smart cities. It is just like upgrading from a bicycle to a supersonic jet – that's how 5G has changed the game, making everything faster, smoother, and ready for the future.

Future of 5G revolution

5G is going to be used in various areas. For example, it is going to enable quick and secure medical data sharing for remote surgeries and telemedicine in healthcare. It will also enhance connectivity for efficient traffic management and smart utilities in smart cities. Cloud Gaming will utilise 5G's ultra-low latency and high speeds. There will be no need for expensive computers; people can stream games on low-end devices via high-speed internet.

In the industrial sector, 5G could unlock possibilities in blockchain voting, remote diagnostics, and surgery. According to STL Tech, physical stores might become obsolete and could be replaced by online purchases delivered via drones. While the future with 5G holds promises, potential challenges include the need for robust infrastructure and addressing privacy and security concerns.

➤ VOCABULARY

1. staggering [ˈstægərɪŋ]	ошеломляющий, поразительный (о масштабе, цифрах)
2. pattern recognition [ˈpætən ˌrekəɡˈnɪʃn]	распознавание образов / закономерностей
3. integral [ˈɪntɪgrəl]	неотъемлемый, составной
4. ingrained [ɪnˈgreɪnd]	глубоко укоренившийся, укоренённый
5. to necessitate [nəˈsesɪteɪt]	делать необходимым, требовать, вызывать необходимость
6. drawback [ˈdrɔːbæk]	недостаток, минус, отрицательная сторона
7. to scale up / down [skeɪl ʌp / daʊn]	масштабировать, наращивать / сокращать объёмы
8. downtime [ˈdaʊntaɪm]	простой, время простоя (оборудования, сети)
9. end-to-end security [ˌend tə ˈend sɪˈkjʊərəti]	сквозная защита (безопасность на всех этапах)
10. data encryption [ˈdeɪtə ɪnˈkrɪpʃn]	шифрование данных
11. access control [ˈækses kənˈtrəʊl]	контроль доступа
12. robust [rəʊˈbʌst]	надёжный, устойчивый, прочный
13. firewall [ˈfaɪəwɔːl]	межсетевой экран, файрвол

14. to infiltrate [ˈɪnfɪltreɪt]	проникать, внедряться (в систему)
15. multi-factor authentication [ˌmʌlti ˈfæktə ɔː ˌθentɪˈkeɪʃn]	многофакторная аутентификация
16. security awareness training [sɪˈkjʊərəti əvˈweənəs ˈtreɪnɪŋ]	обучение персонала основам кибербезопасности
17. digital ledger [ˌdɪdʒɪtl ˈledʒə]	цифровой реестр (журнал учёта)
18. node [nəʊd]	узел (в сети, в блокчейне)
19. transaction [trænˈzækʃn]	транзакция, сделка, операция
20. tamper-resistant [ˈtæmpə rɪˌzɪstənt]	защищённый от подделки / несанкционированного изменения
21. remote surgery [rɪˌməʊt ˈsɜːdʒəri]	дистанционная (удалённая) хирургия
22. telemedicine [telɪˈmedsn]	Телемедицина
23. latency [ˈlertnsi]	задержка, латентность (отклика сети)
24. to stream [striːm]	транслировать, воспроизводить потоком (стримить)
25. obsolete [ˈɒbsəliːt]	устаревший, вышедший из употребления
26. to unlock possibilities [ʌnˈlɒk ˌpɒsəˈbɪlətɪz]	открывать новые возможности

➤ COMPREHENSION CHECK

Exercise 1. Say whether these statements are True or False. Correct the false ones.

1. IT includes the tools, systems and processes we use to handle information.
2. The global IT market hit a record \$9.48 trillion in 2022.
3. The global AI market has grown from \$5.3 billion in 2013 to about \$207.9 billion now.
4. AI is described in the text as "the muscle for computers".
5. In the past, AI could only handle basic tasks such as calculations and pattern recognition.
6. Today about 32.9% of businesses already use AI.
7. By 2025, many jobs in banking and law may be replaced.
8. Cloud computing means storing data on your computer's hard drive.
9. With cloud services companies pay only for what they use.
10. End-to-end security is becoming an important area of cloud technology development.

Exercise 2. Answer the following questions using the active vocabulary:

1. What does IT include, and what role does it play in our digital world?
2. How much did the global IT market reach in 2022?
3. Why is AI compared to "the brain for computers"?
4. What kinds of tasks can AI handle now that it could not handle before?
5. How do businesses use AI today?
6. What are the two sides of AI's development, according to the text?
7. What is cloud computing, and what is its main financial advantage?
8. What challenges can arise when a company uses cloud services?
9. What technologies help with better detection and prevention of cyber attacks?
10. What is the "future" of cloud computing connected with, according to the text?

Exercise 3. Summarize the main idea of the text in 8-10 sentences using your answers in exercise 2 as guidelines.

➤ VOCABULARY EXERCISES

Exercise 1. Complete each sentence with ONE suitable word (or phrase) from the text.

1. IT helps drive the technology _____, and that is what is shaping our digital world.
2. The global AI market has grown from \$5.3 billion in 2013 to a _____ \$207.9 billion now.
3. Before now, we knew AI to only be able to handle _____ tasks like calculations and pattern recognition.
4. In the future, AI will become an _____ part of almost every job.
5. This transition may _____ millions of jobs.
6. Cloud computing means using the Internet to store data instead of your computer's _____.

7. Companies can easily _____ or down depending on their needs.

8. Sometimes there can be challenges like security issues or _____ if the internet goes down.

9. Data _____ and access control technologies are being developed to ensure reliable information protection.

10. Modern technologies like _____ and antivirus programs help prevent harmful software from _____ systems.

Exercise 2. Match the term (1–10) with the correct definition (a–j).

- | | |
|-----------------------------------|---|
| 1. Cloud computing | a. A super-secure digital ledger kept in a chain of connected computers |
| 2. Blockchain | b. Physical devices connected to the Internet and controlled remotely |
| 3. IoT | c. Using the Internet to store data instead of a hard drive |
| 4. Multi-factor authentication | d. A security tool that prevents harmful software from infiltrating systems |
| 5. Firewall | e. Speech and image identification by a computer |
| 6. Encryption | f. A tool that adds layers of protection during login |
| 7. Data speeds with minimal delay | g. Payments and crimes connected with cryptocurrency |
| 8. Crypto crime | h. Coding information so that it stays secure |
| 9. Recognition | i. The key feature of 5G |
| 10. Telemedicine | j. Remote medical consultations and |

Exercise 3. In each line, three words belong to the same group and one does not. Say which word is the odd one out and why.

1. firewall, antivirus, encryption, blockchain
2. \$9.48 trillion, \$5.3 billion, \$207.9 billion, \$10 billion
3. servers, hard drive, hardware, telemedicine
4. 3G, 4G, 5G, IoT
5. tamper-resistant, transparent, secure, obsolete
6. transactions, nodes, blocks, drones
7. recognition, encryption, detection, prevention
8. healthcare, smart cities, traffic management, hard drive
9. replace, boost, infiltrate, maintain
10. privacy, security, downtime, protection

Exercise 4. Form the correct part of speech from the word in brackets.

1. The future holds lots of _____ (possible) for IT.
2. AI helps computers _____ (data) analysis in business.
3. This is a _____ (transform) technology that will change industries.
4. Cloud services are more _____ (efficiency) because you can scale them.
5. Businesses need regular security checks and _____ (protect) tools.
6. Data _____ (encrypt) keeps information secure.
7. 5G offers minimal _____ (delay) and high security.
8. Urban living becomes more _____ (sustain) thanks to smart utilities.
9. Physical stores might become _____ (obsolete) and be replaced by online purchases.
10. Hackers may try to _____ (record) with the data.

Exercise 5. Complete each collocation with the correct noun/verb from the text.

1. to _____ information (handle / maintain / scale)
2. to _____ hardware (maintain / boost / infiltrate)
3. to _____ local economies (boost / encrypt / replace)
4. to _____ data from cybercriminals (protect / track / seal)
5. to _____ machinery (monitor / tamper / encrypt)
6. to _____ assets like delivery trucks (track / boost / scale)
7. to _____ elections tamper-resistant (ensure / handle / maintain)
8. to _____ the records (mess with / scale up / downtime)
9. _____ concerns (privacy / ledger / latency)
10. _____ infrastructure (robust / genuine / integral)

➤ SUPPLEMENTARY READING

Exercise 1. Before reading the text, answer the following questions:

1. Have you ever heard of *remote collaboration tools*? If you don't know the meaning of this term, consult the dictionary or the Internet.
2. Give at least 2-3 examples of such apps.
3. What do you consider as the future IT trend? Can you give some examples?

Exercise 2. Read and translate the text

OTHER IT TRENDS TO LOOK FOR IN THE FUTURE

In the future, some other IT trends will shape the way we live and work. Here's a glimpse of what to expect:

Remote collaboration tools

These apps help people collaborate well, no matter where they are. Whether you're a freelancer, gig worker, or part of a big company, these tools help break down barriers and let you work together as if you all are in the same place.

Of course, there are challenges, like keeping everyone on the same page and dealing with time zone differences. But as tech gets better, these tools will too. They will become even more convenient, and that will make remote work easier and more inclusive for everyone. Now is the right time to be part of the remote work revolution.

Quantum computing exploration

To explain it in the simplest of ways, quantum computing is like having a supercomputer on steroids. It can solve many complex problems at lightning speed, which regular computers can only dream of.

This technology is about to shake up everything we know about computing power. According to Vantage Market Research, the global quantum computing market is set to skyrocket.

Most of the data that computers around the world collect today is not analyzed – just because there is too much data. A quantum computer will be able to handle this problem. There will be a lot of opportunities: from optimizing pipeline systems to inventing new drugs. This technology is only developing now and will be used for doing the things we now can't even imagine.

From the development of AI to inventing powerful quantum computers, the future of IT looks promising. While we can't know exactly what's ahead, it's certain that tech advances will keep reshaping how businesses work and how people live. To thrive, we must stay updated with the latest tools and tackle appearing challenges.

➤ SPEAKING

Exercise 1. Discuss with the group the following questions:

- Which trend will change everyday life the fastest?
- Which one is most dangerous and why?
- Which trend do you personally find the most exciting?

Exercise 2. Write the trends named in the text (e.g. AI, cloud computing, IoT, cybersecurity, big data, quantum computing, automation). In groups rank

them from the first (most important in the next 10 years) to the last. Present its ranking and defend the first and the last position in the class.

Useful phrases: I'd put ... first because..., I totally agree / I'm not so sure..., on the contrary..., what matters most to me is...

Exercise 3. Problem–Solution Role Play. Work in pairs. Student A is a young entrepreneur pitching a tech startup that uses a trend from the text (e.g. an AI-based health app, an IoT smart-home system, a cloud platform for schools). Student B is an investor.

The investor must ask:

- Which future trend does your product rely on?
- What problem does it solve today, and will that problem still exist in 10 years?
- How will you protect your users' data?
- Why should I invest in you rather than in a huge tech company?

In the end the pair reports whether they reached a deal and why.

Exercise 4. Prepares a 1.5–2 minute monologue: "How IT will change my profession / my city / my daily life by 2040", using at least three trends from the text. Students then form a "panel of experts" and answer questions from the audience.

Sample panel questions:

- Which trend from the text are you most sceptical about?
- Will programmers and office jobs still exist?
- Could quantum computers really replace binary ones?
- What new profession will appear in IT?
- Which of these predictions is realistic, and which is pure science fiction?

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