Basic Types of Information Systems

Exercise 1. Read and translate the following text into Russian paying attention to the terms in bold:

1. Basic Types of Information Systems

Over the last several decades the management of information and, thus, of computers and **information systems** has become increasingly more important to the **attainment** of an organization's **goals**. Information is the life-blood of an organization. Most activities performed by managers in an organization such as problem identification and solution, control, and decision-making are based on information. Managers need to receive accurate and timely information to **accomplish** these activities effectively. Computers and information systems permit information to be acquired, processed, and distributed efficiently. They enable businesses **to gain a competitive edge** because accurate, timely, and more complete information allows better decisions to be made.

Most organizations change as a result of both internal and external influences. Computers and information systems provide the **means** to gather and manage the **appropriate** information **to keep pace with change.**

One useful way to represent how an organization can employ information systems technology is to think in terms of three basic kinds of information systems: **transaction processing, management information, and decision support systems.** The data for these systems are organized into well-defined collections of data called **files or databases.**

2. Transaction Processing System

A transaction processing system **captures** the data necessary **to update** existing **records** whenever stored data about the fundamental business operations of the organization must be changed.

The transaction processing system **edits** all input to ensure that it is accurate and complete. For example, a customer-order transaction is **rejected** if it contains an **invalid** account number or if the **product code** of the **item** ordered is missing. Valid transactions are accepted for further processing and invalid transactions are identified so that they can be corrected.

3. Management Information System

A management information system accepts valid transactions from the transaction processing system to **update** the contents of the database. The management information system can draw the data from the database and process it to provide management with information. It can be used to identify opportunities for improvement or to help determine alternative courses of action.

The database may contain a massive amount of details (e.g. three years of customers' orders for a big company may require millions of records). The database is protected against **loss** of its original contents by creating copies of the database and/or the original transactions used to update it. Thus the database represents a vast **storehouse** of facts of significant value to the entire organization and is often referred to as a **corporate database** (e.g., the corporate-order database). A corporate database is used by many different organizations for many different purposes. Special subjects of the corporate database may be combined with other data **to meet specific user needs.** This collection of special-purpose data is often called an **application database.**

4. Decision Support System

People use decision support systems (DSS) to access the application databases (i.e., a database created for a small set of users for a specific use) to get the key facts needed to help make decisions. The decision support system may be fairly simple and **straight forward,** merely producing some type of printed report containing information useful to managers. On the other hand, the decision support system may be a complex system that models some business situation and allows managers **to simulate** what will happen under different conditions. DSSs contain a set of related programs and data to help with **analysis** and decision-making in an organization.

A DSS can present several solutions for one problem. It permits the user to enter, **retrieve,** and analyze data in an **ad hoc** manner. The user does not have to rely on the systems department to change the program, create new relationships among existing data, enter new data, or analyze the data in a new way. As a result, information is available almost immediately. A DSS does not make decisions for users, but it does support them in their decisions. A manager then uses his/her judgment, intuition, and experience to reach a decision.

Exercise 2. Answer the questions:

1. What are the conditions for the information that managers want to receive?
2. What are the main functions of the TPSs? Where can we use them?
3. What are the main functions of the MISs?
4. What is an application database?
5. What are the functions of the DSSs?

Exercise 3. Match the term with its definition.

1) order	a) money held at a bank for a client's use whenever he wishes to take it;
2) account	b) the use of a machine, idea, etc. for a practical purpose;
3) customer	c) a request (as to a tradesman) to supply goods;
4) database	d) one who buys goods from another;
5) contents	e) a systematized collection of data that can be accessed immediately and manipulated by a data-processing system for a specific purpose
6) retrieve	f) the words or ideas that are written in a book, letter etc.
7) simulation	g) to recover or make newly available (stored information) from a computer system
8) application	h) the technique of using artificial data to reproduce conditions that can occur in the work of a system.

Exercise 4. Comprehension check.
Say whether the sentences are true or false:

1. A transaction processing system accepts valid transactions from the management information systems.

2. A corporate database is like a vast storehouse of facts required by several organizations.

3. The decision support system can produce only a printed report useful for managers.

4. A database created for a large set of users is called an application database.

5. DSS can present only one solution for one problem.

Exercise 5. Here are the answers. Make out the questions.

1. Transaction processing, management information and decision support systems.
2. To ensure that it is accurate and complete.
3. They are called files or databases.
4. To identify opportunities for improvement or determine alternative courses of actions.
5. By creating copies of the database.
6. To help make decisions.
7. To simulate what will happen under different conditions.

Exercise 6. Speak about basic types of information systems. How can they help to achieve the organization's goals? Make a short summary of the text.

Exercise 7. Read the texts about other types of information system. Pay attention to the words in bold. Do the exercises below.

Expert Systems

An **expert system**, also called a **knowledge-based system**, is a type of application program used to make decisions or solve problems in a particular field. It uses knowledge and analytical rules defined by human experts in a field. It is called an expert system because it depends primarily on the knowledge of human experts. It functions like an expert in a discipline, solving problems that require knowledge, **intelligence**, and experience. Expert systems are a key part of many decision support and **executive information systems**.

The two major components of an expert system are a **knowledge base** and an **inference engine**. The knowledge is a combination of data and rules to be applied to the data. The knowledge base is the most important component of an expert system. The inference engine is the software that applies the rules from the knowledge base to the data provided by the user to **draw a conclusion**.

Executive Information Systems

Executive is usually synonymous with strategic or **top-level management**. An executive has the responsibility of **setting long-range planning goals** and a strategic course for an organization for the years ahead. An information system that **caters** specifically to the special information needs of executives, such as **managerial planning**, monitoring and analysis, is called an executive information system (EIS).

An EIS incorporates large volumes of data and information gathered from the external environment of an organization, i.e., from sources outside itself. That information is used **in conjunction with** the information generated by management information systems (MISs) within functional areas (e.g., marketing, accounting, production, etc.) of the organization to **accommodate** the specialized information needs of executives. An EIS plays a vital role in summarizing and controlling the volume of information that an executive must read. An executive **assigns** values to the various sources of information from which data for an EIS are drawn in order to place emphasis on most important sources. Thus, EISs can be tailored to meet the specific needs of each executive in an organization.

Exercise 8. Match the words with their definitions:

1. environment	a) the information and understanding that you have gained through learning or experience;
2. conclusion	b) someone with special skills or knowledge, gained as a result of training or experience;
3. knowledge	c) the ability to learn, understand, and think about things;
4. separate	d) knowledge or skills that you gain from doing the job or activity;
5. experience	e) something that you decide after considering all the information you have;
6. concept	f) help or support;
7. expert	g) the situations, people, equipment etc. that influence the way people live;
8. assistance	h) an idea of how something is, or how something should be done;
9. intelligence	i) to divide or split something into two or more parts.

Exercise 9. Open the brackets using the present or past participles.

1. MYCIN is a system (*using/used*) to diagnose infectious diseases and suggest possible treatments.
2. The system was (*developing/developed*) by the scientists of Stanford University.
3. It was a knowledge base (*containing/contained*) expert knowledge about diagnoses.
4. Each rule has a probability figure (*associating/associated*) with it to indicate its level of certainty.
5. MYCIN's performance is almost as good as that of physicians which is (*indicating/indicated*) that this technology has practical business application.

Exercise 10. Answer the following questions:

1. What is an expert system?
2. What are the two major components of an expert system?
3. What does a knowledge base contain?
4. What is the inference engine used for?
5. What role does an executive information system play?