

**Lecture-4.** The concept of an information system and electronic information resources. Services in electronic form

### Learning Objectives

By the end of this lecture, students should be able to:

1. Define the concept of an information system (IS) and describe its components.
2. Understand the classification and types of electronic information resources (EIRs).
3. Explain the principles and structure of electronic information services.
4. Identify the benefits and challenges of using electronic information resources and services.
5. Analyze examples of real-world electronic information services in various fields.

Informatization objects are electronic information resources (EIR), software (software), Internet resources (IR) and information and communication infrastructure (ICI). All of the above, to one degree or another, is also used in the creation and operation of information systems, which will be discussed later. *Note: It is important to note that in accordance with the legislation on the media (clause 4) of article 1 of the Law of the Republic of Kazakhstan "On the Mass Media", any IR is a mass media, and does not require any mandatory registration (there are exceptions - information media, etc. .p.) to recognize it as such, which imposes certain requirements on the content of information in it and its reflection.*

Let's consider the above objects in more detail. What are information and communication infrastructure (ICI) objects - these are information systems (IS), technological platforms (TP), hardware and software complexes (HSC), server rooms (data processing centers), telecommunications networks, as well as information security systems and uninterrupted functioning of technical means.

Information system (IS) is an organizationally ordered set of information and communication technologies, service personnel and technical documentation that implement certain technological actions through information interaction and are designed to solve specific functional problems.

Why is IP so important? Because information itself without systems for managing and processing it has a rather low significance in terms of efficiency and organization of work with it.

Thus, IS is a part of ICI, i.e. the predominant meaning and perception of ICI is primarily infrastructure - i.e. technical and technological aspect, and the IS itself is also a part of informatization objects.

Based on the above definition of IP, it has the following characteristics:

- There are ICI/ICT that make up IS
- There is a staff for the work of IS
- There is a Technical documentation on the IP
- There is an interaction of all the above components
- There is a Purpose of the functioning of the IS - i.e. the results of working with it should definitely be built into the existing system of legal regulation, otherwise the impossibility of their legal use casts doubt on the whole expediency of creating IP.

In this way:

**IKI/ICT as part of IS + Regulation of the work of Personnel with IS + TD on IS + Regulation of the interaction of all parts + Purpose of functioning of IS = IS**

5 components in the IS. 5 enlarged objects. 5 points/inputs for controlling the operation of IC components. Incl. legal methods and tools. The absence of one of the components is not IP.

One of the components of IS is ICT. What is information and communication technologies - this is a set of methods for working with electronic information resources (EIR) and methods of information interaction, carried out using a hardware and software complex (HSC) and a telecommunications network.

Hardware-software complex (HSC) is a set of software and hardware used together to solve problems of a certain type.

Those. if the agro-industrial complex acts as a part of ICT, which in turn is a part of the ISI, and therefore the IS can be / be and / or include:

- the result of the supply from the equipment manufacturer / the result of the provision of services, performance of work;
- the right to transfer/assign the use of the software;
- something else? (transfer of IP management/operation rights from the owner to the owner or to a third party under an agreement, etc.)

Obviously, in each of the above cases, there is a legal interaction of IP owners/owners with the above categories of persons and organizations. Thus, IP is a complex multi-component system not only technically, but also in a legal aspect - i.e. the procedure for working with it is determined not only by its owner, but also taking into account third parties - in whole or in part.

Who is the owner? This is the person who has been granted the right of ownership of the property, i.e. a set of rights of possession, use and disposal - only the owner owns all these three rights in the aggregate in accordance with the civil legislation of the Republic of Kazakhstan.

The right of ownership is a legally secured opportunity to exercise actual possession. The right of use is a legally secured opportunity to extract useful natural properties, as well as to benefit from it. The benefit can be in the form of income, an increase in the volume of accumulated information as a result of its processing, etc. The right of disposal is a legally secured opportunity to determine the legal fate - sale / alienation, etc.

On the other hand, the legislation on informatization, in addition to the owner, appeals with the concept of the owner. In accordance with the Law of the Republic of Kazakhstan "On Informatization", the owner of informatization objects is a subject to which the owner of informatization objects has granted the rights to own and use informatization objects within the limits and procedure specified by law or agreement. Those. The owner of IP is not identical to the owner of IP in terms of the scope of rights and it can be said that he has a certain subordination and a set of rights and obligations assigned to him by the owner under an agreement or by virtue of law - i.e. generally speaking, the owner has authorized the owner to perform a set of actions with IP along with the duties assigned to such person by virtue of law.

Thus, work with IP includes the need to take into account and take into account:

- Conditions for its use by the owner under an agreement with the owner, etc.
- Warranty conditions of the manufacturer, contractor, etc. on the agro-industrial complex, its parts and works used in the creation and operation of IS;
- User and license agreements with the right holders of intellectual property objects included in the IP;
- Other encumbrances and instructions for use and technical documentation for IS and AIC.

Those. Along with the agreement with the owner, there are a number of agreements, although not directly concluded with the owner, but directly affecting and regulating his actions.

IPs are inherently not identical and have their own classification:

- according to the form of ownership: state and non-state,
- according to the degree of access - public and limited access.

Information systems created or developed at the expense of budgetary funds, as well as those received by state legal entities, are state-owned.

Information systems created or developed at the expense of individuals and legal entities, as well as obtained by them in other ways, are non-state.

*Important! Non-state information systems classified as critical objects of information and communication infrastructure, as well as intended for the formation of state electronic information resources, are equated to information systems of state bodies in terms of compliance with information security requirements.*

IP cannot exist separately - except for personnel, it is used by various consumers - citizens, legal entities, government agencies, etc., incl. to receive services, incl. and in electronic form. Those. in addition to personnel (internal users), the above external users also have access to IS. Accordingly, the legal regulation of the work of IP is impossible only by regulating the activities of owners / owners - i.e. It is also necessary to regulate the activities of IP users.

IS, as a rule, is designed to work with electronic information resources. Electronic information resources - information provided in electronic digital form and contained on an electronic medium, Internet resource and (or) in an information system.

Importantly, the main difference between IS and EIR is that EIR can be part of IS, but if EIR is primarily content, then IS are methods, mechanisms for working with the same content.

Electronic information resources, as well as IS, are state and non-state in terms of ownership, public and limited access in terms of access, and this is logical, since they can be part of IS.

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Electronic information resources created, acquired and accumulated at the expense of budgetary funds, as well as received by state bodies are state. Electronic information resources created and acquired at the expense of individuals and legal entities, as well as obtained by them in other ways, are non-state.

However, since EIR is, first of all, the content of the information itself, which, in turn, can have a different nature of its distribution and access to it. Electronic information resources that are provided or distributed by their owner or owner without specifying the conditions of access or their use, as well as information, access to which is free and does not depend on the form of their presentation and method of distribution, are publicly available.

Electronic information resources containing information, access to which is limited by the laws of the Republic of Kazakhstan or their owner or owner in cases established by the legislation of the Republic of Kazakhstan, are electronic information resources of limited access. Electronic information resources of limited access, in turn, are divided into electronic information resources containing information constituting state secrets and confidential.

The assignment of electronic information resources to electronic information resources containing information constituting state secrets is carried out in accordance with the legislation of the Republic of Kazakhstan on state secrets. This is, for example, information in the military field (plans, strength, etc.), in the field of intelligence and counterintelligence activities (personnel, forces and methods, etc.), etc. etc. Electronic information resources containing information that is not state secrets, but access to which is limited by the laws of the Republic of Kazakhstan or their owner or owner, are confidential electronic information resources.

The grounds for the emergence, change and termination of ownership and other property rights to electronic information resources are established by the civil legislation of the Republic of Kazakhstan. Electronic information resources that are the property of a legal entity are included in its property in accordance with the civil legislation of the Republic of Kazakhstan. The owner of state electronic information resources is the state. State electronic information resources held by state bodies in accordance with their competence are subject to accounting and protection as part of state property.

Ownership of software, information systems and Internet resources does not create ownership rights to electronic information resources created with their help and (or) placed in them, owned by other owners or owners, unless otherwise provided by the legislation of the Republic of Kazakhstan or an agreement between them.

Electronic information resources processed in the course of providing services or when sharing information systems and Internet resources belong to the owner or possessor of electronic information resources. Ownership and use of derivative products created in this case are governed by the agreement/contract between them.

We will especially note the category of personal data in the EIR. Personal data - information relating to a certain or determined on the basis of the subject of personal data, recorded on electronic, paper and (or) other tangible media. This can be a full name, date of birth, gender, biometric data, etc. – there is no exhaustive list in the legislation, but there is a requirement that collection, processing and storage should take place only with the consent of this subject (with the exception of cases expressly specified in the legislation – as a result of law enforcement activities, for the purposes of state statistics, etc.)

The owner or owner of electronic information resources containing personal data, when transferring electronic information resources containing personal data to the owner or owner of the information system, is obliged to obtain the consent of the subject of personal data or his legal representative to collect and process personal data using information systems, except for cases provided by the Law of the Republic of Kazakhstan "On personal data and their protection".

When providing a public service in electronic form, the consent of the subject of personal data to the collection and processing of personal data through information systems is provided in the form of an electronic document or in another way using elements of protective actions that do not contradict the legislation of the Republic of Kazakhstan. The personal data subject also has the right to consent to the collection and processing of personal data through his mobile phone number registered on the "electronic government" web portal by transmitting a one-time password or by sending a short text message as a response to a notification from the "electronic government" web portal .

Electronic information resources containing personal data are divided into electronic information resources containing publicly available personal data and electronic information resources containing personal data of restricted access.

Electronic information resources containing publicly available personal data include electronic information resources containing personal data, access to which is free with the consent of the subject of personal data or which, in accordance with the laws of the Republic of Kazakhstan, are not subject to confidentiality requirements.

Electronic information resources containing personal data of limited access include electronic information resources, access to which is limited by the subject of personal data or the laws of the Republic of Kazakhstan.

Accordingly, information systems containing publicly available electronic information resources are publicly available. Information systems containing electronic information resources of limited access are information systems of limited access.

In turn, IS of limited access are divided into:

- 1) information systems in a secure design, classified as state secrets, the protection of which is carried out using state encryption means and (or) other means of protecting information constituting state secrets, in compliance with the requirements of the secrecy regime;
- 2) confidential information systems.

### **Control Questions**

1. Define an information system and describe its main components.
2. Explain the difference between operational and decision support information systems.
3. What are electronic information resources? Give examples.
4. How can the quality of electronic information resources be evaluated?
5. Describe the main types of electronic information services.
6. What are the advantages of using electronic resources over traditional print resources?
7. Explain the importance of security and privacy in electronic information services.
8. Give examples of electronic information services in education and healthcare.
9. How do information systems support the use of electronic information resources?
10. Compare the role of databases and multimedia resources in an electronic information system.

### **Recommended Literature**

1. Laudon, K. C., & Laudon, J. P. (2020). *Management Information Systems: Managing the Digital Firm*. 16th Edition. Pearson.
2. Stair, R., & Reynolds, G. (2020). *Principles of Information Systems*. 13th Edition. Cengage Learning.
3. Turban, E., Pollard, C., & Wood, G. (2021). *Information Technology for Management: Digital Strategies for Insight, Action, and Sustainable Performance*. 11th Edition. Wiley.
4. Chaffey, D., & White, G. (2022). *Business Information Systems: Technology, Development, and Management for the E-Business*. 7th Edition. Pearson.
5. Bawden, D., & Robinson, L. (2019). *Introduction to Information Science*. 4th Edition. Facet Publishing.