**DIGITAL SECURITY**

Digital security is the protection of digital information from internal and external malicious threats. This protection includes detecting, preventing, and responding to threats through security policies, software tools, and IT services.

There are two main types of digital security.

**Physical security** is the protection of personnel, equipment, software, networks, and data from physical actions, intrusions, and other events that may harm an organization. An example of a common physical security threat is an attacker who infiltrates an organization and uses a USB drive to copy and delete sensitive data or physically deliver malware directly to systems.

**Information security** is the protection of any data by using and creating certain programs, encryption, and the like.

A password is a series of characters that verifies a user ID.

Password security is the most common protection of any data from hackers . But such protection is not reliable, since it is necessary to set passwords according to certain rules, if they are not followed, then there will be no point in using this type of digital security protection.

Hardware security is a discipline that includes hardware design, access control, secure computing, secure storage of keys and passwords, code authentication, and the like.

Malware (malicious software) is software created to damage or change the computer data or its operations.

These are main types of malware:

1. **Viruses** are programs that spread by attaching themselves to executable files or documents.
2. **Worms** are self-copying programs that can move from one computer to another without human help, by exploiting security flaws in computer networks.
3. **Trojan** horses are malicious programs disguised as innocent-looking files or embedded within legitimate software.
4. **Spyware**, software designed to collect information from computers for commercial or criminal purposes, is another example of malicious software.

Social engineering is the psychological manipulation of people to perform actions or disclose confidential information. In cybercrime, these “human hacking” scams tend to lure unsuspecting users into disclosing data, distributing malware, or providing access to restricted systems. Attacks can occur online, in person, and through other interactions.

Encryption is the conversion of data from a readable format to an encoded one. Encrypted data can be read or processed only after decryption. Encryption is the basic building block of data security.

**ICT CONCEPTS**

We are now living in what some people call the digital age, meaning that computers have become an essential part of our lives. Young people who have grown up with PCs and mobile phones are often called the digital generation.

The digital **revolution** is the transition from analog to digital technologies. These changes were associated with the spread of information and communication technologies.

The main driving **forces**(силы) are the spread(распространение) of computer technology, first of all - personal computers, the emergence of the Internet, the mass use of digital devices.

Digital revolution has 5 stages: data processing, personal and network computing, cloud and ubiquitous(*вездесущий*) computing.

Data is facts that describe something. Information is simply data that has a particular meaning within a specific context.( or Information is data that is used for a specific purpose.)  
Types of digital devices : smartphones, tablets, iPods, and computers(Laptop, desktop PC, PDA, and others).

The computer system consists of two parts: hardware and software. Hardware is any electronic or mechanical part you can see or touch. Software is a set of instructions, called a program, which tells the computer what to do. The are three basic hardware sections: CPU, main memory and peripherals(monitor, printer, mouse and others).

**Hardware** components:

**Component** system: camera, system unit, display device, hard disk drive and system broad, CD/DVD drive, mouse, computer on/off button, speaker.

**Clamshell** components: camera, display screen, speakers, CD/DVD drive, touchpad, system unit, keyboard.

Slate device: camera, display screen, virtual keyboard, volume buttons, on/off button, home button, speaker.

E-**Wate** is short for electronic waste

E-waste describes computers, phones and other electronic products that are thrown away because are obsolete or broken

**INFORMATION SYSTEMS**

Information system is a system that uses computers and usually includes communications networks. An information system collects, stores, and processes data to provide useful, accurate and timely information more efficiency. One of the major functions of any information system is to help people make decisions in response to problems.

An information system progresses through several phases as it is developed, used, and finally retired. These phases are included into system development life cycle (SDLC).

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| Phase | Activities | Goals | Tools |
| 1. Planning phase | Assemble the project, justify the project, choose the development methodology, develop a project schedule, produce a project development plan | Create a Project Development Plan | Project management software:  PERT (Program Evaluation and review Technique) is a tool needed to identify the minimum time needed to complete the total project; a WBS(work breakdown structure) breaks a complex task into a series of subtasks; Gantt chart uses bars to show the time of each task. |
| 2. Analysis phase | Study the current system, determine the system requirements, and write requirements report | Produce a list of requirements for a new or revised information system | CASE tool (computer-aided software engineering tool) is a software application designed for documenting system requirements, scheduling development tasks, and developing computer programs. |
| 3. Design phase | Choose a solution, select hardware and software, and design detailed application specifications | Figure out how the new system will fulfill the requirements specified in the System Requirements Report | In this phase project team creates a request for proposal(RFP) that describes the information system problem and the requirements for the solution and a request for quotation (RFQ) for a formal price quotation on a list of hardware and software. |
| 4. Implementation phase | Purchase and install hardware and/or software, create applications, test applications, finalize documentation, train users, convert data, convert to new system, make sure that the information system is completely documented | Supervise the tasks necessary to construct the new information system | Application software  Customization  Testing  Conversion software |
| 5. Maintenance phase | Day-to-day operation of the system, making modifications to improve performance, and correcting problems | Ensure that the system functions as well as possible | The term quality of  service (QOS) refers to  the level of  performance a  computer system provides. |

Nowadays identity theft is a major security threat.Therefore, companies use proactive measures to protect information systems from threats. These measures can be grouped into four groups: deterrents, preventive countermeasures, corrective procedures and detection measures. Deterrents reduce the likelihood of data theft. The purpose of preventive countermeasures is to make an attack unsuccessful or reduce its impact. Corrective procedures reduce the effect of the attack.

**JOB SEARCH**

The job search can be divided into several steps.

Firstly, you will understand what you would like to do and what benefits your interests can bring to society.

Secondly, study the market and find a job that will bring you pleasure and also pay well. After you have found a company where you want to work, you should send a letter to this company with a request for a job. If there are still vacancies in this company, then you will receive a response from the company, after which you need to read the job advertisement and make a resume where you describe your abilities, skills and personal qualities. Then you go to an interview, where you answer questions about your resume and your abilities. At the interview, you can ask questions about your future job (salary, schedule, etc.). And the last step is to compose and send a cover letter in which you thank the company for the interview. This letter will increase your chances of getting a job.

The main qualities that can be written in a resume: teamwork, Analytical skills, Creativity, Openness, Flexibility, Organizational skills, Leadership qualities, communication skills.

In the cover letter, you need to:

To thank the company for the interview, to express hopes for employment and two main qualities that will benefit the company.

At the interview itself, you need to be very careful when answering questions and indicate the ability to learn, because you still do not clearly know what is required of you. You can also ask questions to your superiors. Your main task at the interview is to be remembered by your superiors. If you are remembered, then you will most likely get a call back so that you can try to offer a new effective project for the company.

**NETWORKS**

Networking allows two or more computer systems to exchange information and share resources and peripherals.

**A PAN (PERSONAL AREA NETWORK)** allows you to connect smart devices or consumer electronics within a radius of 10 meters without using wires or cables.

**A LAN (LOCAL AREA NETWORK)** is a data network that connects personal computers within a very limited area – usually in the same building.

**A MAN (METROPOLITEN AREA NETWORK)** covers a campus or city and is widely used in cable television networks available throughout the city.

**A WAN (WIDE AREA NETWORK)** covers a large geographical area and consists of several small networks.

Network topology

Topology refers to the shape of the network. There are three main physical topologies.

Star: There is one central device to which all the others are connected.

Bus: Each workstation is connected to a main cable called a bus.

Ring: The workstations are connected to each other in a closed loop configuration

There are also mixed topologies, such as three, a group of stars connected to a central bus.

The Internet is an International computer Network made up of thousands of networks linked together.

Components The Internet consists of many systems that offer different facilities to users, www, the World Wide Web, is a network of documents that works in a hypertext environment, i.e. using text that contains links, hyperlinks to other documents

The Internet of Things (IoT) is the concept of basically connecting any device with an on and off switch to the Internet (and/or to each other). This includes everything from cellphones, coffee makers, washing machines, headphones, lamps, wearable devices and almost anything else you can think of.

**PROGRAMMING**

Programming is the process of creating computer programs. Programming Paradigm is a style, technique, or way of writing a program. We can also say programming paradigms are the various approaches to solve a problem. There are 4 main programming paradigms : procedural, object-oriented, functional and logical.

**Procedural** programming can also be called imperative programming. It is a programming paradigm based on the concept of procedure calls, in which operators are structured into procedures (also known as subroutines or functions). They are a list of instructions to tell the computer what to do step by step.

**Logic** programming is a computer programming paradigm based on mathematical logic in which program operators express facts and rules about problems within a system.

**Functional** programming is a programming paradigm in which you have a style of building the structure and elements of computer programs. Here you treat calculations as an evaluation of mathematical functions and avoid volatile and mutable data.

Object-Oriented Programming (OOP for short) is a software system development paradigm in which applications are made up of objects.

A programming language is a set of instructions that people use to interact with computers.

Game programming is part of the process of developing computer games (video games). Game programming requires specialization in simulation, computer graphics, artificial intelligence, physics, sound, and data entry. Online multiplayer games require additional knowledge, such as network programming and database programming.

***Artificial*** intelligence is a technology, or rather a branch of modern science that studies ways to train a computer, robotic equipment, analytical system to think intelligently as a person.

*VR* (Virtual reality) - an artificial digital environment where users also hear sounds and see artificial images around them.

*AR* (Augmented reality) - this technology allows you to see the real world by supplementing it with digital content.

*MR* (Mixed reality) is a kind of augmented reality, but more interactive because the user interacts with it.

Machine learning is a class of artificial intelligence methods, the characteristic feature of which is learning through the use of solutions to many similar problems.

Robotics is the science of creating and using robots in all branches of life.

**SOFTWARE**

Software is a set of instructions, called a program, which tells the computer what to do.

Hardware does not work without software. An operating system is a set of programs that is located between application software and computer hardware.

The most important program in the operating system is the supervisor program

Three main functions of the operating system:

1) manage computer resources such as CPU, memory, disk drives and printers.

2) create a user interface

3) perform and provide services for application software

App = Software designed for a single purpose and performs a single function.

Application = Software designed to perform a variety of functions.

(что писать в mobile, web, local не особо понимаю, можете привести примеры таких приложений наверное)

One of the features that you can use to buy and install apps is an app service provider. Instead of installing software on every computer or server in your organization, you rent applications from an ASP that provides remote access to the software and manages the hardware needed to run the applications.

Software licenses are a tool that helps developers limit (restrict) pirated use of applications. Forms of copy protection: serial numbers, registration requirements, expiration dates, etc.

Software piracy is the theft of legally protected software. Theft includes illegal copying, distribution, modification or sale of software. Software piracy is becoming a rare event. Increasingly, people are exchanging information such as pirated movies, TV shows, etc.