# ***TOPIC 7***

**7.1 Definition of an information system, its goals, and examples of applications; types of information systems and their main characteristics.**

IS is a combination of software, hardware and telecommunication networks to collect useful data, especially in an organization. The goal of the information systems is to transform data into information in order to generate knowledge that can be used for decision making. There are three basic levels of the IS: executive level - the highest level, middle management level and operation level.

An example of systems of the highest level is the Executive Information System. It is used by CEOs to make decisions. It can use some information which is unknown to the human mind.

An example of systems from the middle management level is the management information system and the decision support system. Management information systems help managers make different processes automatic that were initially done manually.

And a decision support system is an information system that analyzes business data and other information to offer automation in decision-making or problem solving. They don’t have analytics and problem-solving capabilities so usually they are used for making statistics and reports.

An example of systems of the lowest level is the transaction processing system. The transaction processing system automates the financial transactions. And bank machines and applications are examples of using IS.

And one more example is process control systems. Process control systems make sure industrial processes are carried out efficiently, consistently, with as little variation as possible and make sure working practices are carried out safely and profitably

**7.2 SDLC and its core phases. Definition of the SDLC planning phase, its goal and main activities.**

SDLC - system/software development life cycle. It is a project management model. It defines stages that are necessary to bring a project from its idea all the way to deployment and later maintenance.

Planning phase is a stage when you should find your team and discuss your future project. PP is the phase in which developers will plan for the upcoming project. During this phase you should come up with a budget and a timeline. You'll also want to come up with the core features or functions of the app so you don't overdevelop. Your budget is likely limited to some extent. Planning out everything that the app will include or do will help you avoid wasting money later down the road.

At the end of this stage, you’ll have an idea, a sense of how the app will work, and a plan for its development.

**7.3 Definition of the SDLC analysis phase, its goal and main activities.**

SDLC - system/software development life cycle. It is a project management model. It defines stages that are necessary to bring a project from its idea all the way to deployment and later maintenance.

Analysis phase of SDLC is the second phase. Its main goal is identifying and gathering software requirements. During this phase you should take into account limitations and resources of the project. Also you should remember about needs of future users. Main activities of this phase are requirements gathering and analysis,make feasibility study and creating technical and functional specification.

On this stage developers should create a document which is called “Software requirements”

**7.4 Definition of the SDLC design phase, its purpose and activities; hardware and software alternatives; selection tools of the design phase.**

Design phase is one of the essential phases of SDLC. The design phase is a stage where

software developers define the technical details of the product. Depending on the project, these details can include screen designs, databases, sketches and system interfaces. The main goal of this phase is to translate the system requirements into a technical design document that can be used to guide the development team during the implementation phase. Main activities of this phase are сreating data models and diagrams, developing algorithms and code structures, designing the user interface and creating test cases and planning for testing.   
Here are some common tools which can be used during design phase: uml diagrams, pseudocode and prototyping tools.   
When you create a design of your software, you should remember that clients will use it on different devices such as smartphones, laptops, PCs etc. And you should consider it into details. To consider it you should remember about memory, performance and cost.

**7.5 Definition of the SDLC implementation phase, its purpose and activities; types of testing; types of conversion.**

Implementation phase is a phase when you integrate your product into different work processes.The main goal of this phase is to integrate your software into different systems. Its main activities are testing of your product, installation your program on the servers and teaching customers to use it

There are a lot of types of testing, I can highlight 5/some of them.

* The First is Unit-testing. They just check individual methods and functions of classes or modules. They are very quick and cheap.
* The second type is integration tests. They check how individual components of your software (e.g. databases) interact with each other. They are more expensive than unit-tests.
* The 3rd is functional tests. They check only results but not the process.
* The 4th type is end to end tests. They check user processes, how users interact with your software.
* And the last type is performance testing. They check how the system keeps with the workload.

Also one of the activities of this phase is to upgrade and improve your software. You create new versions but it is hard to support all of them. So there are some types of conversion.

* The 1st is direct changeover. It means that one day you stop supporting the old version and start a new version. Users can’t use them at the same time.
* The 2nd is parallel conversion. Your clients can use 2 versions in parallel. But when we can get the same results from both versions, the old one is stopped and the new one is put into use
* The 3rd is gradual conversion. Developers combine the best features from previous versions and integrate a new one step by step.

**7.6 Goal and key activities of the SDLC maintenance phase; considerations that should be taken during the maintenance phase; types of modification during the maintenance phase; quality of service and the metrics being used to measure it.**

Maintenance phase is the last phase of SDLC. The main goal of it is to support your software, improve it and help it to function correctly. Key activities of this phase are correction of defects and bugs, adapting it to new environments and changing it according to users requests, improving it to upgrade performance or memory costs.

Also when you improve your software you should take into account some factors such as financial factor, user experience, safety and compatibility with all features of OS and devices.

There are some types of changes which you can make: e.g. corrective modifications to remove bugs, perfect modifications to improve performance and usability and adaptive modifications to adapt your software to changes into OS .

You should take care about the quality of your software and there are some pointers which can help you to measure it. For example performance, usability, security and reliability

**7.7 Potential threats to information systems; measures to protect data and information systems.**

**7.8 Future trends in information systems; pros and cons of online voting.**

There are many trends but I can highlight the main 7 trends of IS in 2023.

The 1st is AI and machine learning. AI is a network which keeps a lot of different knowledge and functions like a human brain but with much more speed. Today specialists use it in different spheres. Machine learning - is a science about development of algorithms and models which are used by computers to solve problems and make logical conclusions without human intervention. AI & ML processed large amounts of data, can make more accurate forecasts and can take feedback into account.

The 2nd is IoT -internet of things. It is a network of things, which can exchange data between each other through the internet. It can be usual household devices or big concept e.g. smart factory. So its scale varies from 2 devices to a global network.

The 3rd is cybersecurity. Cybersecurity is the protection of internet-connected systems such as hardware, software and data from cyberthreats. Now it one of the main trends because data is the most valuable asset

The 4th is RPA- robotic process automatization. RPA - it is an invisible robots which are act as human. For example, they understand where are buttons on the screen and other elements of the interface. As the result of this trend, employees can focus on more intellectual work, error is completely excluded and productivity increases without financial costs.

Also there are some trends such as 3d printing, genomics, blockchain and online voting. And there are some pros and cons of online and offline voting. OFFline voting is very easy, but it also has low voting speed and security issues. Online voting on the contrary has high voting and tallying speed but it is quite difficult and also has some security issues.