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SOFIA UNIVERSITY
"ST. KLIMENT OHRIDSKI"
EST. 1888



ICT-TEX course on Digital skills

Topic 1: ICT Fundamentals

The course is developed under Erasmus+ Program Key Action 2:
Cooperation for innovation and the exchange of good practices [Knowledge Alliance](#)

ICT IN TEXTILE AND CLOTHING HIGHER EDUCATION AND BUSINESS

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Introduction

- ICT means Information and communication technology
- ICT is a term that has been used in many aspects of technology perception in modern society
 - Text processing and electronic tables
 - Tools for digitalization of business, (like Social media, online collaboration tools, etc.)
 - Programming and web development
 - Software engineering
 - Artificial intelligence
 - Business analytics and enterprise management
 - Etc.

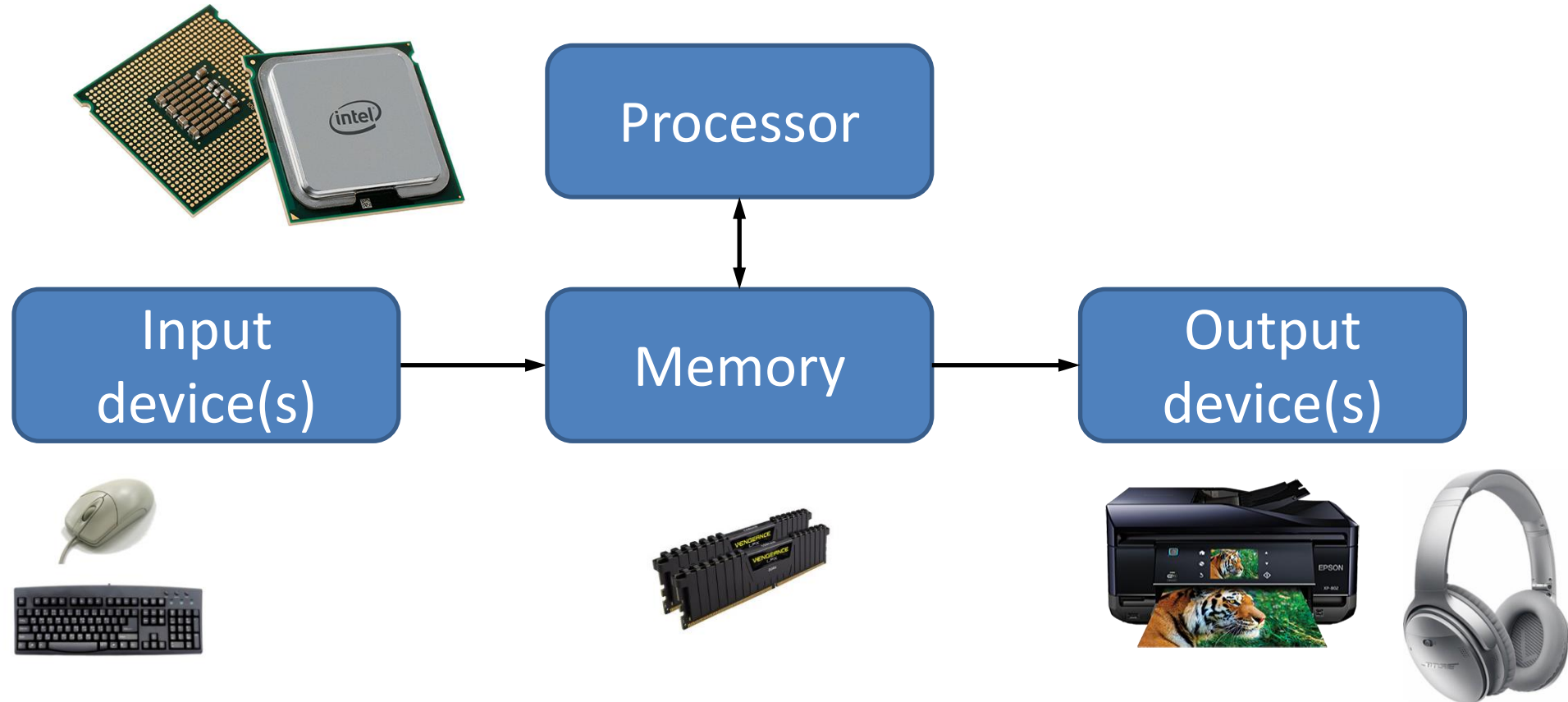


Information and Communication Technologies (ICT)

- All topics mentioned in the previous slide are covered in the course
- In this module you will get acquainted with some ICT basics and get prepared about the main concepts in the area



What exists into a computer (the hardware)



The computer

- A computer is a machine that executes sequences of instructions that process data.
- It is common for the popular computers that both instructions and data reside into the **memory**.
 - This is called von Neumann architecture.
- Modern computers use specialized system level software to perform many common tasks needed for their everyday operation.
- Such systems are usually called operating systems



How does the computer operate (the software)

- The of instructions used by the computer to process data are combined into computer programs
- Combination of programs, libraries and other data (like documentation or digital media) is called software
- There exist two main types of software:
 - Applications – this category includes software used by end users to accomplish specific task (like video playing, online shopping or information processing)
 - System software – this category includes software used to control the hardware, like provision of basic functionalities required by users, or to enable execution of other software.

Software development

- All kinds of computer software is usually developed by use of programming languages
- There are many languages, each suited for specific purposes. Some of the popular general-purpose programming languages are:
 - C/C++
 - Java
 - Python
- You can find more about programming in topic 6 of this course.



Software development

- Not everything about successful development of a software is about programming
- Software engineering is the discipline that deals with all activities that should be carried out in software development:
 - Requirements gathering
 - Design
 - Implementation
 - Testing
 - Maintenance



Artificial intelligence and machine learning

- Artificial Intelligence (AI) is behaviour of the machine (e.g. the software) in which it takes decisions without human intervention
- Machine Learning (ML) is the process of machine (e.g. software), gaining experience about certain phenomena by gathering and analyzing data about that phenomena.

Operating system (OS)

- Software that serves as an interface between the computer hardware and both the applications that execute onto it and end users.
- This means that computer should have OS in order to be able to install and run other software onto it.
- Popular operating systems include:
 - Windows
 - Linux
 - MacOS
 - And also, Android, IOS – for mobile devices

Functions of an Operating System

- Process management
 - Starts and stops systems or user processes and provides mechanisms for synchronization and communication among them.
 - Keeps track of time & resource used by various job and users.
- Memory management – is about allocation and de-allocation of memory space to programs in need of these resources.
- File management – provides functionalities for organization storage, retrieval, naming, sharing, and protection of files.



Functions of an operating system

- Input/Output Management – provides users with functionality for input and output
- Security – modern operating systems have modules to provide common security protection
- Networking – provides functionality to connect over the network with other computers and devices



Functions of an operating system

- Device Management - keeps track and manages all devices attached to the computer
- Communication management – coordination and assignment of compilers, interpreters, and another software resource of the various users of the computer systems.

File systems

- A file system is part of the operating system that controls how data is stored and retrieved.
- It organizes the data into manageable pieces, where each piece has unique name or identifier
 - Most common examples of such pieces are files and folders
- There exist different kinds of file systems. Each one has different structure and logic, properties of speed, flexibility, security, size and more.

File Management System

- A file management system is used for file maintenance (or management) operations.
- A file management system has limited capabilities and is designed to manage individual or group files, such as special office documents and records.
- It manages and displays file meta-information, like owner, creation date, state of completion and similar user-friendly features.





File Management System

- Usually, files into an operating system are stored in a complex hierarchical organization constituted of directories and subdirectories with files stashed inside these them.
- In fact, file management systems take care of how the files are organized rather than just how they are stored.
- Typical operations include
 - Create
 - Delete
 - Open
 - Close
 - Read
 - Write





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