Computer concepts

Information has always been a powerful tool. At present we live in the information age. It based on digital electronics. The digital revolution offers advantages, but requires adaptations. Digital innovations require societies to make adjustments to traditions, lifestyles and legislation.

Data processing is the computing model for the first phase of the digital revolution. In the first phase computers were huge, complex and expensive devices. The second stage was presented by personal computing which is characterized by small, standalone computers powered by local software. The third phase of the digital revolution materialized as computers became networked and when the Internet was opened to public use. Cloud computing characterizes the fourth phase of the digital revolution.

Computers run two main types of software: application software and system software. Whereas application software is designed to help a person carry out a task, the primary purpose of system software is to help the computer system monitor itself in order to function efficiently. An example of system software is a computer operating system (OS), which is essentially the master controller for all the activities that take place within a computer.

In everyday conversation people use the terms data and information interchangeably. Professionals define data as any raw facts or observations that describe a particular phenomenon that represents people, events, things and ideas. Data becomes information when it is presented in a format that people can understand and use. Data is used by machines, such as computers, information is used by humans. Information is simply data that has a particular meaning within a specific context.

Data representation refers to the form in which data is stored, processed, and transmitted. Data can be represented using digital or analog methods.

Digital data is text, numbers, graphics, sound, and video that have been converted into discrete digits such as 0s and 1s. Most computers use the simplest type of digital technology – their circuits have only two possible states. For convenience, let’s say that one of those states is «on» and the other state is «off».

A stationary desktop computer contains the internal nodes of the personal computer and peripheral devices: system unit; keyboard; mouse; display system; hard disk drive; optical drive; removable storage; sound system; network and Internet access; printer.

RAM (random access memory) or dynamic RAM (DRAM), is a temporary holding area for data, application program instructions, and the operating system. RAM holds raw data waiting to be processed, the program instructions for processing that data, the results of processing until they can be stored more permanently. The instructions are loaded into RAM every time you start your computer.

Whereas RAM is temporary and volatile, ROM (read-only memory) is permanent and non-volatile. The contents of ROM are «hard-wired» in the circuitry and remain in place even when the computer power is turned off. Newer EEPROM (electrically erasable programmable read-only memory) is a type of ROM that is non-volatile but user-modifiable.

In a PC, the contents of ROM are sometimes referred to as the BIOS (basic input/output system). The bootstrap loader’s instructions tell the computer how to access the hard disk, find the operating system, and load it into RAM. After the operating system is loaded, the computer can understand your input, display output, run software, and access data files. The bootstrap loader requires some basic information about storage, memory, and display configuration. UEFI (Unified Extensible Firmware Interface) being more effective is used instead of BIOS.

To operate correctly, a computer must have some basic information about storage, memory, and display configurations. The information is held in CMOS, a type of chip that requires very little power to hold data.