**Topic 4 ICT Concepts**

**PEN PER**

296

**P**

**digital revolution**

Information and communication technologies (ICT) are a **set of technologies** developed to improve the efficiency of information use and improve communication.

Thanks to ICT, it has become easier for people to communicate at a distance,

**quickly find** various information and learn something new.

The digital era has evolved through four phases,

**In the first phase** computers were huge, complex and expensive devices.

They **existed** in limited numbers, primarily housed in big corporations and government agencies.

**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** characterized the fourth phase of the digital revolution. Cloud computing provides access to information, applications, communications and storage over the Internet.

**Data refers** to the symbols that represent people, events, things, and ideas. In everyday conversation people use the terms data and information interchangeably. make a distinction between the two terms. They define data as is 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. Information may be data that has been processed in some way.

**data processing**, the input is data, the output is useful information. So, data processing is a series of actions or operations that convert data into useful information.

digital devices (types)

Now commonly used computer categories include personal computers, servers, mainframes and supercomputers.

A **personal computer** is a microprocessor-based computing device designed to meet the computing needs of an individual. It provides access to a wide variety of local and cloud-based applications.

The term **server** has several meanings. the purpose of a server is to serve computers on a network by supplying them with data.

A **mainframe** computer is a large and expensive computer capable of processing data for hundreds or thousands of users.

**Mainframes** are generally used by businesses or governments to provide centralized storage, processing and management for large amounts of data.

A computer falls into the **supercomputer** category if it is can tackle complex tasks and compute-intensive problems that just would not be practical for other computers.

**Computer hardware** is a collective term used to describe any of the physical components of an analog or digital computer.

Computer have three main hardware sections:

**Computer have three main hardware sections:**

**· The CPU –** a microprocessor chip which used for processes data and coordinates activities of other chips;

**· The main memory – holds the instructions** and data which are being processed by the CPU. Have a two main sections: RAM(Random Access Memory) and ROM(Read Only Memory);

**· Peripherals are the physical units attached to the computer. E-waste** contains a list of chemicals that are harmful to people and the environment. When electronics are **mishandled** during disposal, these chemicals end up in our soil, water, and air.

We can solve the problem of e-waste by being more **mindful about** where our e-waste ends up. We can limit how much we produce and the impact it has on the environment.

**With the flo**od of e-waste growing around the world, recycling alone will not be enough. In order to reduce e-waste,

**manufacturers need** to design electronics that are safer and more durable, repairable and recyclable.

**Most importantly**, this means using less toxic materials.

**5.** **Topic 5 Software**

**software** - all non-hardware components of a computer. determines the tasks a digital device can help you accomplish.

**The instructions** that tell a computer how to carry out a task are referred to as a computer **program**.

These programs **form the software**

that prepares a computer to do a specific task,

**such as document production, virus protection**, file management, or Web browsing.

The **two main categories** are

system software and application software.

**Operating systems** are classified as system software. **Device drivers,** utilities, and programming languages are also system software.

**Application** software categories include music, graphics, mapping, finance, and entertainment.

**AS designed** to help people accomplish **real-world tasks**, whereas

**SS** is designed for computer-centric tasks.

**An Operating System** (OS) is the low-level software that supports a computer's basic functions, such as

store and process data. There’re various types of inf syss: transaction processing syss,

**PEN PER**

296

**P**

**management** **inf** syss,

**decision-support** syss and

**executive support** syss. An inf sys

progresses through several phases as it’s developed, used, and finally retired. These phases encompass a **System**

**Development Life Cycle** (**SDLC).**

**1 Planning**. Assemble the project team, justify the project, choose the development methodology, develop a project schedule, produce a project development plan.

**2 Analysis**. Activities for anal. ph.:

study the current sys, determine the sys requirements and

write **requirements report***.* The project team

**determines** requirements by

**interviewing** users and studying successful inf syss that solve similar problems. Another way to determine requirements is to construct a prototype.

**3** **Design**. The project team must figure out how the new sys will fulfill the requirements specified in the

**Sys Requirements Report**. The project team chooses

**a solution**, **selects hard and software**, and designs

**detailed application specifications**.

**4 Implementation**. The project team supervises the tasks necessary to construct the new inf sys. The tasks of the impl. ph.: buy and install hard and/or software, create apps, test apps, finalize documentation, train users, convert data, convert to new sys.

**5 Maintenance**. The Maint. ph. is the last and the longest SDLC ph. and it lasts until the sys is retired. It involves day-to-day operation of the

sys, making modifications

to improve performance, and correcting problems. 3 key concepts ensure

good quality of maint. service:

*reliability, availability* and *serviceability*. Common

**threats** to corporate inf. syss: natural disasters, power outages, equipment failures, human errors, software failures, security breaches, acts of war and malware. When a company’s brand is used without authorization, the company has become a victim of

**identity theft.** Corporate identity attacks can undermine customer confidence,

overwhelm customer service, generate bad publicity and result in lost revenues. To help minimize risks the hard and software for most corporate inf syss are housed in

**data centers**.

A **d.c.** is a specialized facility designed to hold and protect computer syss and data. Most d.c. limit physical access using password protection and fingerprint identification syss. Several

**proactive measures** can protect inf syss from threats: deterrents, preventive countermeasures, corrective procedures and detection activities.

**Deterrents** reduce the likelihood of

deliberate attack. Both

**physical deterrents**, such as

**limiting access** to critical servers, and

common deterrents, such as

**multi-level authentication,**

**password protection, and**

**biometric identification** fall under this category.

**Preventive countermeasures** shield

**vulnerabilities** to render an attack unsuccessful or reduce its impact.

**Firewalls that prevent unauthorized access** to a system and encryption that makes stolen data

i**ndecipherable** are examples of preventive countermeasures.

**Corrective procedures** reduce the effect of an attack. Data backups, disaster recovery plans, and the availability of redundant hardware devices: examples of corrective procedures.

**Detection activities** recognize attacks and trigger preventive countermeasures or corrective procedures. Antivirus software

detects viruses entering a sys and can be configured to perform corrective procedures such as removing the virus and quarantining infected files.(7)

**8.** **Programming.** Computer programming – process of writing a source code**.**

Prog. languages - set of rules that are necessary to write a source code.Comp program – set of functions**.** The most popular prog ls today are python, java, javascript, c++, c#**.**

Statement – single line of code

that perform a specific task.

With prog we are giving directions to the comp.

**Prog paradigm** refers to a way

of conceptualizing and structuring the tasks a comp performs.

Today’s most common prog paradigms are:

**Event-driven** - focuses on choosing user interface elements and defining event-handling routines that are triggered by various mouse or keyboard activities. *Visual Basic, C#***.**

**Procedural -** focuses on linear steps that provide the computer with instructions on how to solve a problem or carry out a task. *BASIC, Ada, Pascal, Fortran, COBOL***.**

**Object-oriented -** describes programs as a series of objects and methods that interact to perform a specific task. *Smalltalk, C++, Java, Scratch***.**

**Declarative -** describes aspects of a problem that lead to a solution and help to solve problems for non-numeric data, including

words and concepts. *Prolog.* The prog l that uses just 0s and 1s is called a machine (low-lvl)*.* The prog l utilizing simple English words is called source(high lvl)*.*

A compiler/interpreter is a program that converts a high-lvl l into machine code.

A program written in one of high-lvl prog ls if often called a source program.There are some types of errors in programs:

**A good computer maintenance routine:** Back up ur files regularly, particularly those that are most important to u; Run utilities that ensure peak performance for ur hard disk drive; Delete ur browser’s

**PEN PER**

296

**P**

history and cache files on a monthly basis in order to free up space for your temporary files; Apply the latest operating sys, driver, and security updates; Scan your computer for viruses and spyware 1s a week.

**Security sw** is designed to protect computers from various forms of destructive sw and unauthorized intrusions. Security sw: antivirus, antispyware, anti-spam, and firewalls.  
The terms **malicious sw** refer to any comp program designed to surreptitiously enter secretly a comp, gain unauthorized access to data, or disrupt normal processing operations. Malware includes viruses, worms, Trojans, bots, and spyware.

A **comp virus** is a set of program instructions that attaches itself to a file, reproduces itself, and spreads to other files. Any code that is designed to hide the existence of processes and privileges is referred to as a

**rootkit**.

A **comp worm** is a small self-replicating, self-distributing program designed to carry out un authorized activity on a victim's device.

A **dropper** is designed to deliver or "drop" malicious code into a device.

A **security suite** integrates several security modules to protect against the most common types of mw, unauthorized access, and spam.

**Antivirus software** is a type of utility sw that looks for and eradicates viruses, Trojan horses, worms, and bots. In the context of cyber security,

**social engineering (SE)** is a deceptive practice that exploits human psychology by inducing victims to interact with a digital device in a way that is not in their best interest The target of a social engineering exploit is an individual or organization that may be tricked into participating in the scam.

Social engineering attacks prey on human vulnerabilities, such as gullibility, ignorance, curiosity, greed, courtesy, indifference, and carelessness.

To prepare for a possible

**ransomware** exploit, be sure to maintain current backups of your important data and disconnect the backup device when backups are not in progress.

**10.** **JOB HUNTING.** Job hunting involves more than searching for open positions and sending your resume to employers. U also need to make sure u’re a good fit for the job, can catch the hiring manager’s attention and are well-prepared to answer interview questions.

**Build ur professional brand.** Create profiles on networking sites. A strong personal brand that portrays you in a professional light will provide recruiters, employers, and contacts with a strong positive impression of u as a candidate they should be interested in.

**Create ur resume/CV and Cover Letter**. It’s important to take the time to write targeted résumés and cover letters that specifically link ur qualifications to the hiring criteria for the jobs u’re applying for.

**Connect with everyone u know**, because u never know which contact may be able to help u with ur job search or put u in touch with someone who can.

**Keep ur job search focused**. Use the job search engines to find jobs by using keywords that match ur interests and the location where u want to work. . It’s a good idea to research company information and

**create a list of companies** to target in ur job search. u can do some special outreach to get ur app noticed and get email notifications for new job openings immediately after they are posted.

**Be clear and simple**

**when describing the job you want**.

**A resume or CV (Curriculum vitae)** is a brief document that summarizes you as a job candidate. Most resumes include educational history, applicable skills (hard and soft skills)

and summary of qualifications (official certifications or workplace achievements).

**A cover letter** is a detailed document that shows hiring managers ur

desire for a particular job. It is an opportunity to demonstrate more of ur personality than you can on y

our resume. Throughout the letter, you can discuss specific

items listed in the job description and how your skills and experience match those requirements. You shou

ld **adapt your resume to each job you apply for**. Study the job description to determine why you are a great fit. Add ur skills, experience and measurable achievements that are relevant to that position. **Hiring managers** who look through many resumes should be able to read urs and quickly k

now that u have the skills for the position. **Professional ethics** encompass the personal and corporate standards of behavior expected by profess-s. There are some **universal ethical principles** that apply across all profe

ssions: honesty, trustworthiness, loyalty, respect for others, avoiding harm to others, accountability. **The job i**

**nterview** is ur best chance to show the a hiring manager that u’re the best person for their job. Preparing for an interview primarily means taking time to thoughtfully consider ur goals and qualify

cations relative to the position and employer. Before ur interview, u should

have **a good understanding of why you want the job** and why you’re qualified. Modern companies usually have **social media accounts and blogs** that discuss their company culture and

industry. This information

n can give you an impression of the tone and personality of the company, as well as what they value. (10)