TeleGrow
Enhancing the Teleworking Digital Skills for the Middle aged employees

How to TeleGrow Training Modules: The Ultimate Teleworking Training for VET providers

FLORIDA CENTRE DE FORMACIÓ, SCV

Module 2 – Information and Technology (IT) Basics

Index

1. Introduction to the topic

Digital skills have become essential for personal and professional life. However, many citizens do not have adequate digital skills. The **Digital Economy and Society Index** (DESI) shows that 4 out of 10 adults and every third person who works in Europe lack basic digital skills. (*Shaping Europe's Digital Future, 2022, March 20*). People without any or with minor access to basic digital skills face the threat of exclusion, given that they may be unable to participate in work, education, communication, and society in general.

COVID has also highlighted the need to improve digital skills. Many workers have had to make a great effort to adapt to remote working conditions, especially those over 50 as they tend to have lower digital and ICT skills. **Teleworking** has since become a new way of working that will be part of the future work environment. And this will require strengthening the digital skills of the current and future workforce.

The European Commission is determined to tackle the digital skills gap and promote projects and strategies to improve the level of digital skills in Europe. **TeleGrow** project wants to improve the employability of VET Learners and employees over 50 by upskilling their digital skills with the collaboration of VET Trainers and Providers to promote the adoption of teleworking as a new way of working.
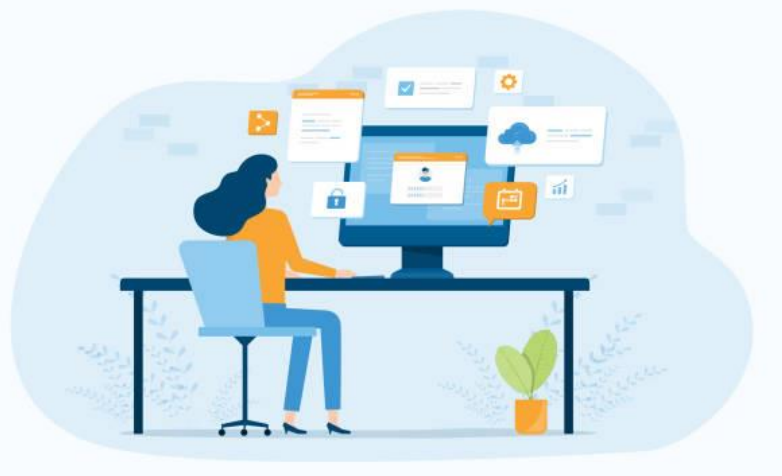
Teleworking environment
Source: istockphoto.com

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On the other hand, we are experiencing a digital transformation of our economies and societies. This is the **4th industrial revolution** that is having an impact on all sectors and accelerating their transformation. It is based on digital technologies such as artificial intelligence, cloud computing, nanotechnology, the internet of things, digital printing, augmented reality and big data, among others. The intensity of technological and organizational change increases the need for training to adopt new software, hardware or other technical production equipment or implementation of new work organisation.

The **digital transformation** is fueled by a broad set of technologies, ranging from everyday products such as mobile phones, personal computers and applications to the infrastructure and connectivity to support them. In this module we will learn the basic concepts of information and communication technologies, since without them it is impossible to understand the next levels of digitization and better face the 4th industrial revolution.

This module is also based on the first of the digital competencies area: **Information and data literacy**, of the European Digital Competence Framework for Citizens, also known as DigComp 2.1. (Carrero et al. 2017) which offers a model to improve citizens' digital competence.

DigComp Framework
Source: https://ec.europa.eu/social/main.jsp?catId=738&furtherPubs=yes&langId=es&pubId=8203

2. Learning objectives

Upon the completion of this module reading, the learner will manage:

- Strategies to find the information according to his/her needs and evaluate the reliability of the information and digital content.
- Basic IT (*Information Technology*) concepts: hardware and software.
- Basic operations: How to install a new device and a new application.
- Basic networking terminology, mobile technology and cloud computing.
- Basic operations: How to connect to the Internet.
- Data storage to save documents and files on different hardware (USB, hard disk, …) or using a cloud storage service (Dropbox, Onedrive, Googledrive, iCloud…)
- Basic operations: How to organize your files and how to use a cloud storage service.
- 4th Industrial Revolution concepts and related technologies.

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3. Learning contents

Chapter 1: Information literacy.

> **"Information literacy empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion in all nations."**
>
> Alexandria Proclamation on Information Literacy and Lifelong Learning. (2005). Information literacy | United Nations Educational, Scientific and Cultural Organization. Retrieved April 29, 2016.

Information literacy has become one of the most important skills in the digital world. Finding and managing information, critically evaluating it and applying it to solve a problem empowers people and enables them to become independent lifelong learners. In this chapter, we are going to review the key steps to carry out searches effectively.

CREATING AN INFORMATION SEARCH STRATEGY

4 SIMPLE STEPS

1 FORMULATE THE NEED FOR INFORMATION
Determine the most relevant keywords, identify synonyms and terms related to the topic of our interest.

2 SELECT APPROPRIATE INFORMATION SOURCES
Select the most appropriate documentary sources within our reach: books, magazines, newspapers, patents, technical standards, among others.

3 PREPARE THE SEARCH AND EXECUTE IT
Design the search strategy, using Boolean operators and other basic tools to retrieve information efficiently.

4 EVALUATE THE INFORMATION OBTAINED
Make sure that the electronic information you have found is true and reliable, using basic evaluation criteria.

Steps for an effective information search
Source: own elaboration

Step 1: Formulate the need for information

First of all, we have to have a clear idea of the topics we want to retrieve, the type of documents (books, articles, etc.), the language, the format (text, audio, video, etc.) and if we need current information or not.

Once we know what we want to find, we need to express it in terms of a language that can be used in the electronic resource (database, catalogue). For this, it is important to determine the most relevant keywords and, identify synonyms and terms related to our topic of interest.

Step 2: Select appropriate information sources

Information sources are closely related to your need for information, so it is essential to choose the one that best suits it. In this way, we can select between books, magazines, newspapers, patents, technical standards, among others.

Information sources
Source: istockphoto.com and own elaboration

If you are looking for updated information, you can search for journal articles, websites, papers, newspapers, etc. If, instead you are looking for a general or critical view of the subject, you can search for it in books, theses, websites, videos, etc. You can find basic information in encyclopedias and specialized dictionaries, or statistical information in online statistical information sources. Search engines like Google scholar, for example, provide you with online access to relevant studies, journals or books related to a particular topic.

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Step 3: Prepare the search and execute it

In a search strategy, it is essential to use tools that allow us to retrieve the information of interest efficiently. Otherwise, we can get too many results (known as "documentary noise") or not retrieve any data (known as "documentary silence").

A practical way to limit our searches is by using **boolean operators**, which are words or signs that allow us to combine different terms to establish logical relationships between each of them; They are very useful for expanding or narrowing the results in an information search.

When we search for information on the Internet, we usually use search engines such as Google, Bing or Yahoo. Search engines have advanced search tools. In Google, you can access this option from the configuration tab. You will not need to use operators because Google offers a simple interface to narrow down your searches.
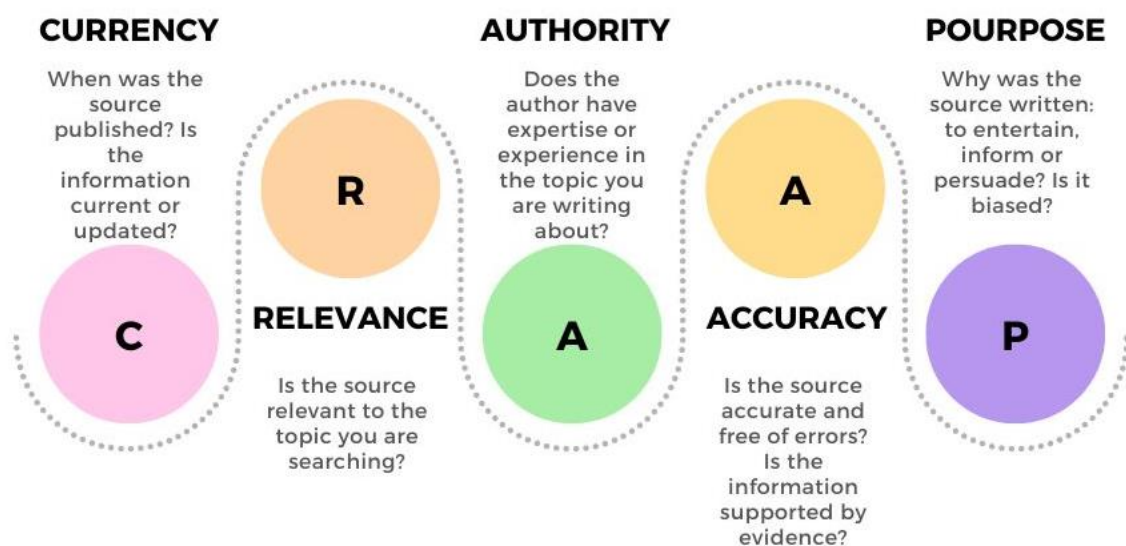

Source: istockphoto.com

Some strategies to improve the results of your searches:

- Indicate an exact phrase using quotation marks. To do this, you should write the exact words in quotes.
- Exclude terms. To do this, you should add a minus sign in front of words you do not want to appear in the results.
- Search for a specific site. Search for a site (for example, www.searching.com) or limit results to a domain, such as .edu, .org, or .gov.
- Search for a specific language. It allows you to find pages in the language you select.
- Search for a specific region. It allows you to find pages in the region you select.
- Search for a specific type of file. It allows you to find pages in the format you prefer, for example .pdf files.

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Step 4: Evaluate the information obtained

Not all the information we find on the Internet is true and reliable. It is important to critically evaluate it using some basic criteria. There are several tests to assess the reliability of information found on the Internet. One of them is the CRAAP Test, which is an acronym for Currency, Relevance, Authority, Accuracy and Purpose. Each element comprises a number of questions that the user must answer to evaluate the resource. Sarah Blakeslee has developed the CRAAP test with her team at the University of California, Chico.

CRAAP TEST

CURRENCY
When was the source published? Is the information current or updated?

C

RELEVANCE
Is the source relevant to the topic you are searching?

R

AUTHORITY
Does the author have expertise or experience in the topic you are writing about?

A

ACCURACY
Is the source accurate and free of errors? Is the information supported by evidence?

A

POURPOSE
Why was the source written: to entertain, inform or persuade? Is it biased?

P

CRAAP Test
Source: infographic adapted from https://www.teacherspayteachers.com/Product/CRAAP-Test-Reference-PosterHandout-5952234

Download the complete test to evaluate information at:

https://library.csuchico.edu/sites/default/files/craap-test.pdf or do it online at the website:

https://craaptest.net/

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Chapter 2: Hardware / Software

Technology is shaping the future and is continuously evolving. We don't know what they will be like in 100 years, but the hardware and software will be there serving as the foundation. In this chapter we will review these basic concepts.

We refer to hardware, software, and networking including the Internet as **Information Technology (IT)**. The acronym IT is broadly extended and refers to the use of technology to communicate, transfer data and process information.

IT has become a part of our everyday lives, both personal and professional. We use it on a personal level to connect and communicate with others, play games, share media, shop and to socialize. IT is widely used by professionals as it plays a very important role in companies, supporting many business functions and driving innovation and productivity.

The adoption of technology has grown in recent decades mainly due to the fact that it is becoming more accessible, intuitive and easy to use for all audiences. However, it is important to understand the **basic IT concepts** to be able to get around and solve small operational problems. The objective of this module is exactly this.

Source: istockphoto.com

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A **computer system** is a set of integrated devices that input, output, process, and store data and information. The computer system consists of both **hardware and software** components. Hardware cannot function without software, and vice versa.

Hardware

Computer hardware refers to the physical components of a computer system.
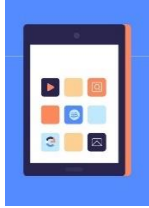

Source: istockphoto.com

Software

Software refers to programs or applications that provide instructions to computers to perform a particular task. It is an intangible component.

Source: istockphoto.com

![TeleGrow logo](Enhancing the Teleworking Digital Skills for the Middle aged employees)

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Digital devices

Computer hardware encompasses digital devices that you can physically touch. This includes devices such as the following:
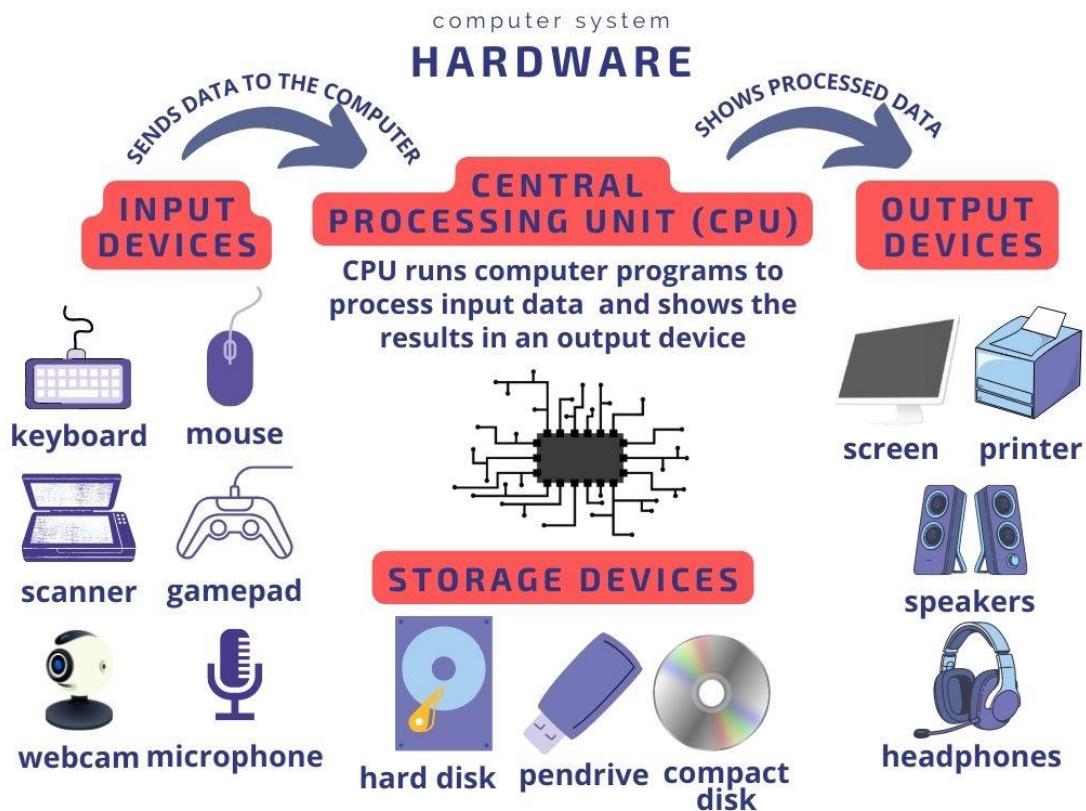
Desktop computers	Laptop computers	Tablets	Smatphones	e-Readers
Personal computer (PC) designed for regular use at a single location on or near a desk due to its size and power requirements.	Small and portable personal computer (PC) with a screen and alphanumeric keyboard.	Portable device with a touch sensitive screen, that allows to type on a virtual keyboard and use your finger as a mouse pointer.	It is a more powerful version of a traditional cell phone. It can connect to the Internet and do same things you would normally do on a computer.	They are similar to tablet computers, except they are mainly designed for reading e-books. They have a display which is easier to read than a traditional computer display.

Hardware categories

There are many kinds of hardware that can be installed inside and connected to the outside of a computer. They are called **internal and external devices** respectively.

We can classify computer hardware into four categories:

- **Input** devices: They provide data to the computer.
- **Output** devices: They display information to the user.
- **Processing** devices: They process the information (including devices such as the CPU, memory and motherboard).
- **Storage** devices: They store data. Divided into primary and secondary memory.

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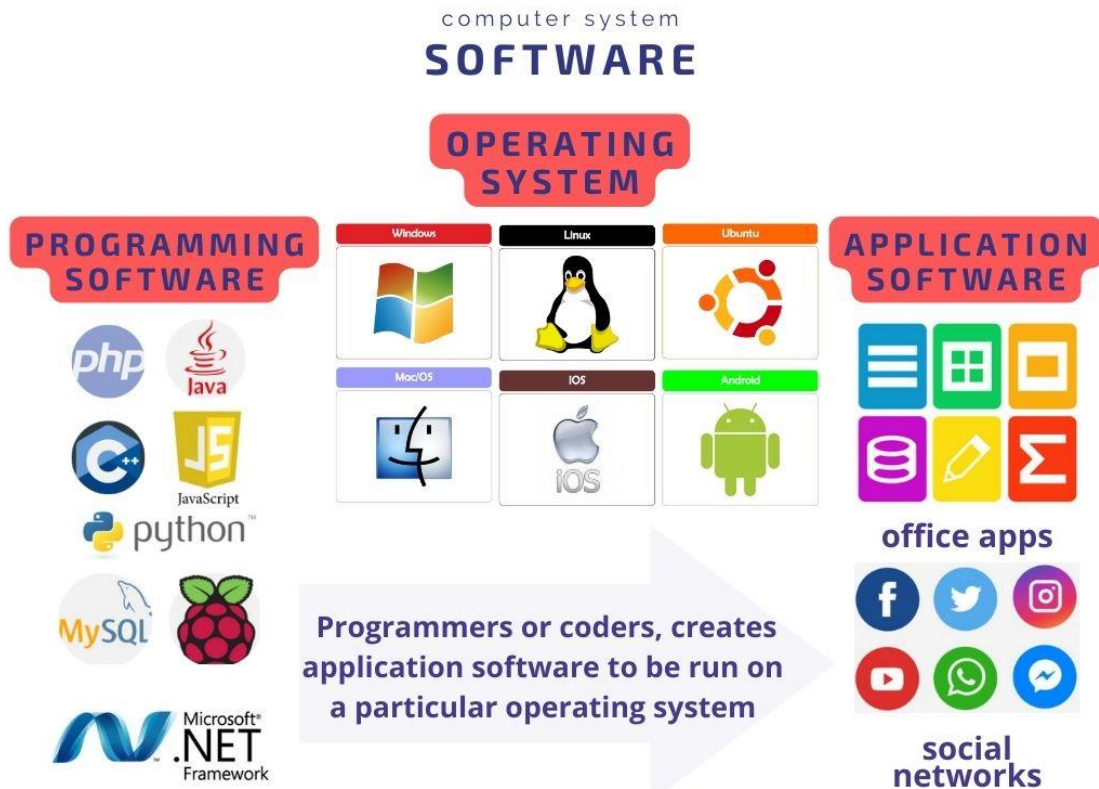of the European Union

Hardware classification
Source: own elaboration and istockphoto.com

Software categories

Software is a set of instructions that helps the user to interact with the computer, and can be classified in:

- **System** software: It acts as a middle layer between the user and a computer.
- **Programming** software: It is used by a computer programmer to create software programs and applications.
- **Application** software: It is generally used by the end-users to perform any task.

The most important system software is the **operating system.** It acts as an interface between the user, application software and the computer hardware and it provides a user-friendly interface. Microsoft Windows, MacOS, Linux as open-source software, and Android and iOS for mobile devices are the most widely used operating systems.
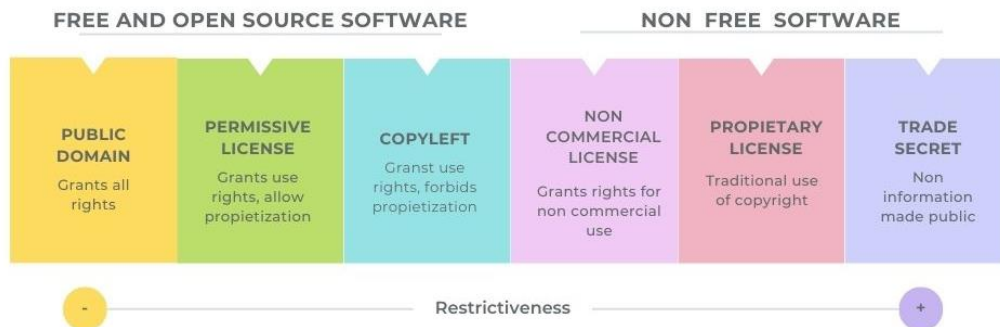
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Software classification
Source: own elaboration and istockphoto.com

Types of software licenses

A software license is a legal instrument that governs the use and redistribution of software (*Wikipedia, 2022*). All software is copyrighted, but authors can donate their software to the public domain. Therefore, you can find two main types: free and open-source software (FOSS) and proprietary software.


Source: Software license - Wikipedia

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How to configure a new device

Most of the devices you will need to install on your personal computer (PC) will be plug-and-play (PnP). This means that our operating system will detect the new hardware and run the setup wizard to install a driver. The driver will allow the operating system and the device to communicate with each other.
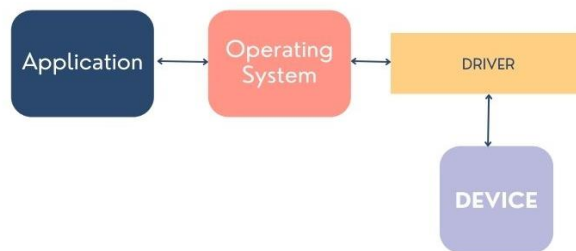
Driver function
Source: own elaboration

Control panel

You can view and change system settings in the control panel of the operating system. Click the start button of your Windows operating system, type *Control Panel* in the search box and select *Control Panel* in the results. You will find options to add or remove hardware and software, access network settings or change accessibility options, among others.

Source: istockphoto.com

How to install a new application

When you buy a new personal computer or laptop, you need to have the operating system installed. Most of the time it comes already installed which makes it easy to be "ready to use". But you will need to install specific software so that it has the features you need: office software, graphic design, browsers, email programs, etc... for which you will need the corresponding license to use.

1. Download the software (normally, it is an .exe file).
2. Execute the file (double click).
3. Follow the setup wizard to install the software. An icon will be added to your desktop and an entry to your application list.

Keep in mind that a lot of the software can be run in the "cloud" using a browser, so you will not always need to install it on your computer.
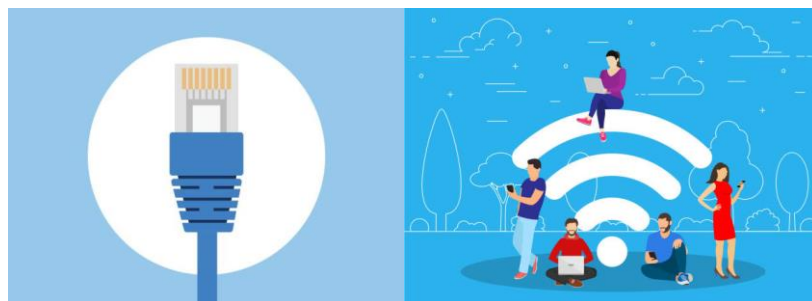

Source: istockphoto.com

Chapter 3: Networking terminology

Networks provide interconnection between two or more computers or digital devices with the purpose of transmitting, sharing or exchanging data and resources. The Internet, email, e-commerce, video-on-demand, social networking and video conferencing are made possible by computer networks. We live in a hyperconnected world where networks are essential for business, research, and entertainment.

Source: istockphoto.com

It is possible to establish a network connection using either **cable or wireless media**.

Ethernet cable   *Wi-Fi connection*

Source: istockphoto.com

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There are two types of networks defined by the geographic location of the computers and digital devices that connects:
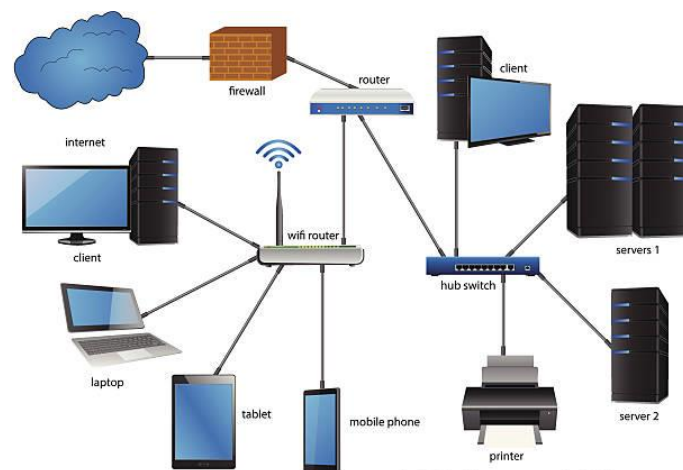
- **Local Area Networks (LANs)**: computers are connected in a defined physical space, like an office, or a building of a company.
- **Wide Area Networks (WANs)**: computers are connected across continents, like Internet, the largest WAN connecting billions of computers worldwide.

Computer network components

Computer networks connect **nodes** like computers, routers, and switches using cables, fibre optics, or wireless signals. These connections allow devices in a network to communicate and share information and resources.

Networks follow **protocols**, which define how communications are sent and received. These protocols allow devices to communicate. Each device on a network uses an Internet Protocol or IP address, a string of numbers that uniquely identifies a device and allows other devices to recognize it.

Routers are virtual or physical devices that facilitate communications between different networks. Routers analyze information to determine the best way for data to reach its ultimate destination. **Switches** connect devices and manage node-to-node communication inside a network, ensuring that bundles of information travelling across the network reach their ultimate destination. (IBM, 2022, The Fundamentals of Networking | IBM)

A company network architecture. Source: istockphoto.com

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One of the most common **network architectures** is the *client/server*. In this, some computers act as **servers** that are responsible for managing resources and providing services to **client** devices on the network. For example, there are file servers, print servers, database servers, mail servers and other application servers that offer remote services to the clients who request them. In the case of *peer-to-peer* (P2P) architectures, each computer on a network acts as both a client and a server, sharing resources and having the same privileges on the network.

Computer network security

Today, network security has become critical for businesses, governments, and on a personal level as well. Computer network security protects the integrity of the information contained by a network and controls who has access to that information. As a network has many entry points, the **firewalls** monitor network traffic and prevent access to parts of the network based on security rules.

The weakest link in a network is the user, so it is very important to have an active and preventive role against hackers and malicious software, strictly following the recommendations of companies and governments to stay safe. Starting by having a secure password and paying attention to the veracity of the email messages that reach us, (*You can learn more about online safety on module 6*).
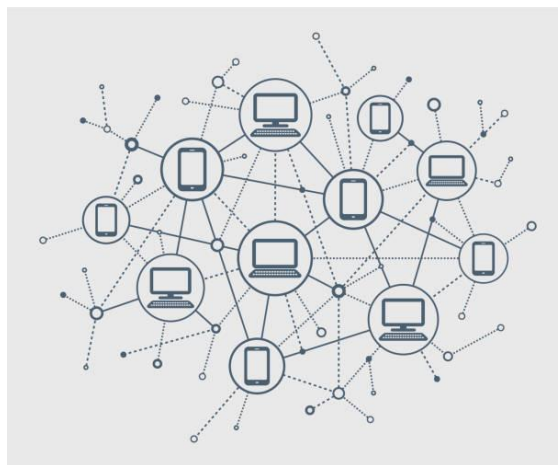

Source: istockphoto.com

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Internet

The internet is a network of networks that connects billions of digital devices worldwide. Standard protocols like TCP/IP allow communication between these devices. Each component connected to the Internet requires an **IP address** that uniquely identifies it and allows it to communicate. The IP address can be compared to your postal address, which provides a unique address to which to deliver information.

The origin of the Internet dates back to 1969, when ARPANET (Advanced Research Projects Agency Network) connected three universities in California (United States). Another milestone occurred with the creation of the World Wide Web (WWW) in 1990. The WWW is a set of protocols that allows the consultation of hypertext files. Apart from the Web, there are other protocols on the Internet, like SMTP for sending e-mails, FTP for file transmission, VoIP for telephony, etc.

Source: istockphoto.com

Internet Service Providers (ISPs) are companies that provide their customers access to the Internet using different technologies: ADSL, fibre optics, GSM, 3G, 4G, satellite, etc. They also provide e-mail services, web hosting services, domain registration, etc...

The **bandwidth** of an Internet connection measures the maximum capacity of a network connection. **Speed** measures the volume of information that can be sent in a given time. It is expressed in bits per second (bps), Mbps (Mega bps), or Gbps (Giga

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bps). Depending on the number of devices and users you want to connect at the same time, and the type of applications you will be using, such as streaming, gaming, or other activities that require large capacity, you will need more or less bandwidth.

Life today would be unimaginable without the Internet. It is present in our daily lives, both personal and professional. It has demonstrated an extraordinary power for innovation and creativity providing us with new services and facilities that require connectivity to the internet: e-commerce, e-learning, communication and social networks, public services, information access and dissemination, e-marketing, SOVD (Subscription Video on Demand) or TVOD (Transactional Video on Demand), etc.

How to connect to the Internet

To establish a connection to the Internet you will need:

1. Choose a type of internet connection taking into account those that are available in your area, the type of services you will need and the number of users that will connect simultaneously: DSL (digital subscriber line), fibre optic broadband, wireless, satellite and mobile broadband or dedicated leased line.

2. Choose an Internet Service Provider (ISP) according to the costs and quality of services that provides, the bandwidth capacity, and the terms and conditions of the service. Most of them offer a range of packages aimed at different levels of users.

3. Set-up the hardware and software needed. The most common hardware you will need is a **router**. Many times, the ISP provides you with this component. The router connects to the Internet entry point and allows that several devices and computers connect to the Internet sharing the bandwidth.

4. Configure your Wi-Fi network. Many routers are wireless, which allows you to create a **Wi-Fi network**. Most devices have a built-in Wi-Fi connectivity, if not, you can buy a Wi-Fi adapter that works by plugging into the USB port.

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Once you have connected the router we recommend avoiding the default settings by establishing a new password, a name for your Wi-Fi and securing your network by using the WPA2 encryption mode. In this way you will prevent other users from connecting to your network and accessing your network data.

Once you have set-up your Wi-Fi you only need to find the Wi-Fi networks available on your devices, choose your named network and connect by entering your network password.

Typical Home Internet Connection
Source: istockphoto.com

Mobile technology

Mobile technology includes devices such as smartphones, tablets, and watches, but has also spread to laptops and GPS navigation devices. There are more mobile phones connected to the Internet than people in the world (Hootsuite, 2022). Smartphones have democratized Internet access and have generated new business opportunities.
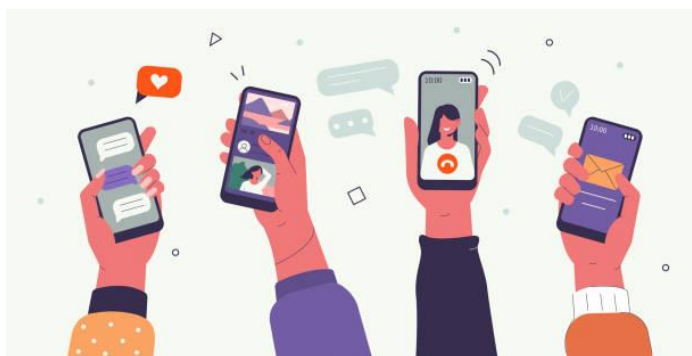
Source: istockphoto.com

The communication networks that connect these devices are called wireless technologies. There are different types:

- **Cellular network.** This is the technology underlying mobile phones. **4G** is the current cellular standard for most wireless communications. It is the evolution of GSM and 3G. 5G is coming and will be 20 times faster than 4G. 5G standard will allow new applications such as virtual and augmented reality or autonomous driving.
- **Wi-Fi**. Connects devices to the internet using routers.
- **Bluetooth**. Connects devices in short distances, like headphones, smartphones, speakers, etc.

Cloud computing

Cloud computing refers to the technology that allows remote access to computer resources and services through an Internet connection. It enables access to data storage, databases, software, development tools and networking capabilities, among others.


Source: istockphoto.com

There are three **types of cloud computing**:

- Infrastructure-as-a-Service (**IaaS**). It provides the users with the possibility to rent IT infrastructure such as servers, storage, operating system, etc.
- Platform-as-a-Service (**PaaS**). It provides the users with a platform to develop, test, and deliver any software application.

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- Software-as-a-Service (**SaaS**). It allows users to connect to and use cloud-based applications over the Internet, paying a monthly or annual subscription fee. Many business software is distributed on a SaaS basis: ERPs (Enterprise Resource Planning), CRMs (Customer Relationship Management), Office software like data processors or spreadsheets, Business Analytics Software, etc.

Cloud computing benefits

Cloud computing has become very popular compared to the on-premises model due to the enormous advantages it has for companies and users:
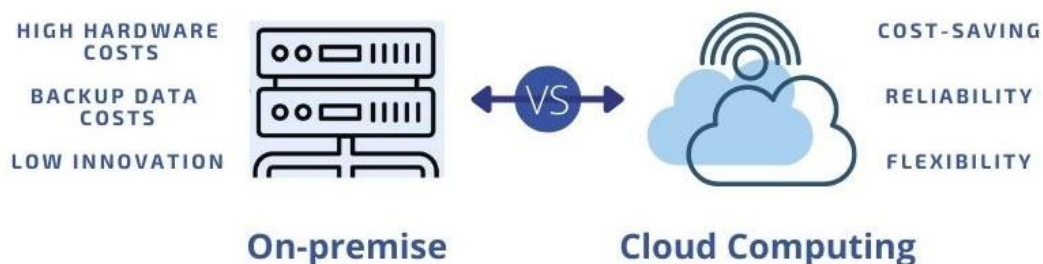
On-premise versus Cloud Computing
Source: own elaboration

- **Cost-saving**. This is the most important benefit compared to the on-premises model, as it avoids having to invest in physical equipment that becomes obsolete over time and requires maintenance. This responsibility for the investment and maintenance of the equipment is transferred to the provider of the cloud computing service.
- **Flexibility.** Cloud computing provides scalability to adapt the resources to the real needs of companies and pay per use. It provides unlimited storage space as you do not need to invest in expensive hard drives but upgrade your storage space by paying a minimal fee.

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- **Mobility and collaboration.** This technology allows you to access information and software whenever and wherever you want, just with an Internet connection. It makes it easy to work and collaborate with people around the world who can easily and securely access data stored in the cloud.

- **Reliability.** Data backup and recovery are easier and not very expensive once it is stored in the cloud. The cloud provider guarantees this service.

- **Innovation.** This is one of the most important benefits, as cloud computing providers continually invest in enhancements that are deployed to all customers.

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Chapter 4: Data storage

Data generated by companies or by us, personally or professionally, needs to be stored and retrieved for later use. Data can be stored in physical or virtual storage devices.

Physical drives

- **Non-portable.** Your computer or laptop is equipped with a hard drive that allows you to save the documents you are working with. Traditionally, computers used internal **HDD** (Hard Disk Drive) that was characterized by being mechanical. Currently, **SSDs** (Solid State Drive) that carry flash-based memory have become widespread, because they are faster, more reliable and have a longer useful life.

- **Portable.** Sometimes we need to take information with us to use it on another computer or to make a backup copy. In this case, we can use removable storage systems that plug into the USB port of our computer. They are **flash drives**. They are quite cheap, depending on their storage capacity, and easy to use.

Cloud storage

Cloud storage is the most common service of cloud computing. This means that the information is saved on servers on the Internet using an account with a cloud service. This service allows you to access data from anywhere with a computer that has an Internet connection, share data with other users and collaborate, and also make backup copies.

It is a service that has been widely adopted at the business level but also at the user level, for our personal and professional use. Some popular applications are Google Drive, iCloud Drive, Dropbox and Microsoft One-Drive. These platforms have mobile

applications that allow users to easily access their data from their mobile devices (smartphones, tablets, …).

Source: istockphoto.com

Measures of digital information

A bit is the smallest unit of information in computing. A bit can only have two values: 0 or 1, corresponding to the electrical values of turning off or turning on, respectively. Bits are the foundation of data storage.

Bits are grouped into 8s to form a byte. A byte can represent an ASCII character, such as "f". A kilobyte (Kb) is 1.024 bytes (which is 2^{10}). Storage devices and computer memory are usually measured in megabytes (Mb) and gigabytes (Gb), although current storage systems' capacity has increased considerably, being able to store petabytes and terabytes of data at a reduced cost.

Unit	Equivalent
1 kilobyte (KB)	1.024 bytes
1 megabyte (MB)	1.024 KB
1 gigabyte (GB)	1.024 MB
1 terabyte (TB)	1.024 GB
1 petabyte (PB)	1.024 TB
1 exabyte (EB)	1.024 PB

Computer file system

A computer file system determines how files are named and where they are logically placed for storage and retrieval. File systems depend on operating systems (OS), such as Microsoft Windows, macOS, and Linux.

Data is stored in files that are organized into folders and sub-folders. To locate a file, your computer needs the **path** to the file from the top of the **hierarchy** of folders, called the root.
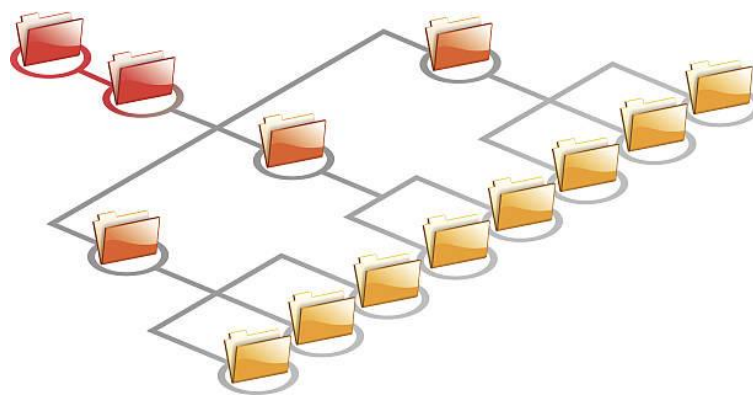
Computer file system hierarchy of folders
Source: istockphoto.com

Each file stored on a computer has an extension that determines the type of file and its use. A **file extension** is composed of 3 or 4 letters, and it is placed at the end of the file following the character ".".

File extension	Example	Type of file
.docx	Letter.docx	Microsoft Word document
.jpg or .jpeg	Image.jpeg	JPEG graphic
.png	Graphic.png	Portable Network Graphic
.exe	Program.exe	PC application
.zip	Compress.zip	PC Zip compressed file
.xls	Spreadsheet.xls	Microsoft Excel spreadsheet
.mp3	Audio.mp3	Audio digital compressed file

A file extension is usually associated with an application. When you double-click on a file, your operating system looks for the program that has the extension associated with it to open it. The same type of file can be opened by more than one program. In the Windows operating system, you can configure the default program associated with a particular file extension from the control panel.

How to organize your files

We work with many files; related to work (such as clients and reports), leisure (such as music and photos), and personal management (such as invoices and projects). Organizing and naming files in a consistent way makes our work easier and saves us time. Follow these tips:

- **Have a common way of naming files and folders.**
    - Use short names.
    - Use abbreviations or suffixes to describe the contents of the folder or file.
    - Group them by year, by project name or by client.
    - Use capital letters or special symbols like _
- **Organize the files in folders and subfolders**, grouping files by projects, years, and the content of the files for example budgets, marketing, finance, etc…
- **Keep the folders and files you work with more at hand** by creating shortcuts from your desktop.
- **Check, delete and clean.** Today's storage systems offer unimaginable capacity. But it is important to do a periodic review to eliminate what no longer serves us or copy it to an external storage device.

How to use a cloud storage service

To start using a cloud storage service like Dropbox, OneDrive or Google Drive you have to sign-up to create an account. Choose a username and a strong password. You can start using the free plan or a paid plan with more storage capacity and features.

Cloud storage makes it easy to sync files, share them, keep multiple versions of a file, and keep backups. We can say that the flexibility offered by these systems has almost replaced physical storage units.

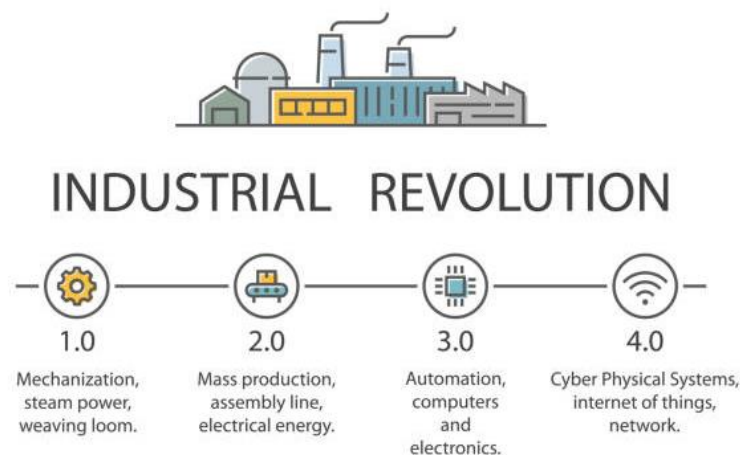These are the main functionalities that you can find in this kind of service:

- **Upload and download files.** While using a cloud storage service you will need to download and upload files. **Downloading** means obtaining a copy of the file on your computer. **Uploading** means storing a copy of a file from your computer to the cloud storage service.

- **Sync folders.** This feature is very interesting because it allows you to make an exact copy of a folder on your computer to the cloud, and keep it automatically synchronized. This way, any changes you make in the cloud or locally will be updated in both locations. It also serves as a backup.

- **Collaboration.** Cloud storage systems allow you to easily **share files and folders**, generating a link that you can send by email. This link can allow the user only to view the file, download it or edit it.

- **Versioning.** This option enables you to configure the cloud storage system to keep old versions of the files. In this way you can recover previous versions of a file if you need them.

To keep your data safe and secure, read the policies of your cloud storage provider. They usually offer good security but it is a good practice to make a copy of your data on a physical storage drive, in case you lose access or you have any other problem.

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Chapter 5: The 4th Industrial Revolution

We are immersed in the Fourth Industrial Revolution, characterized by the advancement of emerging technologies that are challenging the status quo and the world as we know it. This term was first coined by Klaus Swab, founder of the World Economic Forum, in 2016.

Throughout history, we have experienced four industrial revolutions. This concept is used when profound and widespread technological changes occur, which are capable of globally transforming the economic and social basis of countries.

INDUSTRIAL REVOLUTION

1.0	2.0	3.0	4.0
Mechanization, steam power, weaving loom.	Mass production, assembly line, electrical energy.	Automation, computers and electronics.	Cyber Physical Systems, internet of things, network.

Source: istockphoto.com

"The First Industrial Revolution used water and steam power to mechanize production. The Second used electric power to create mass production. The Third used electronics and information technology to automate production. Now the Fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century. It is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres". The Fourth Industrial Revolution: what it means and how to respond | World Economic Forum (weforum.org)

The technologies of the 4th Industrial Revolution:

4th Industrial Revolution technologies	
Artificial Intelligence (AI)	AI is the ability of a computer to act like a human being. It has several applications, including software simulations and robotics.
Cloud computing	Cloud computing is the delivery of different services over the Internet. These resources include tools and applications like data storage, servers, databases, networking, and software.
Internet of Things (IoT)	IoT refers to anything connected to the Internet. It includes traditional computing devices, but also includes a growing list of other devices that have recently become Internet-enabled. Examples include home appliances, automobiles, wearable electronics, security cameras, and many other things.
3D Printing	3D printing or additive manufacturing is a process of making three dimensional solid objects from a digital file. It is achieved using additive processes. In an additive process an object is created by laying down successive layers of material until the object is created. Each of these layers can be seen as a thinly sliced cross-section of the object.
Augmented Reality (AR) and Virtual Reality (VR)	AR and VR are reality technologies that either enhance or replace a real-life environment with a simulated one. Augmented reality (AR) augments your surroundings by adding digital elements to a live view, often by using the camera on a smartphone. Virtual reality (VR) is a completely immersive experience that replaces a real-life environment with a simulated one.
Big Data	Big Data refers to extremely large data sets that may be analysed computationally to reveal patterns, trends, and associations, especially relating to human behaviour and interactions.

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4ᵗʰ Industrial Revolution technologies	
Blockchain	A blockchain is a decentralized, distributed, and oftentimes public, digital ledger consisting of records called blocks that are used to record transactions across many computers so that any involved block cannot be altered retroactively, without the alteration of all subsequent blocks. Blockchain is widely used by cryptocurrencies, like bitcoins. Private blockchains are used for business purpose.
CoBot	A CoBot is a collaborative robot, used in tandem with humans, often in production, manufacturing, or industrial environments. Cobot applications contrast with traditional industrial robot applications in which robots are isolated from human contact.
Digital Twin	A digital twin is a digital representation of a real-world entity or system. It is a highly complex virtual model that is the counterpart of the physical one. The digital twin receives input from sensors gathering data from the physical product/system to simulate the physical object in real time, offering insights into performance and potential problems.

Source: Wikipedia, Gartner IT Glossary and Techterms

All these technological advancements generate controversial views about their implications for the future of employment. Some reports have been published warning of the disappearance of 40% of jobs as we know them now due to robotics and automation.

This implies a great challenge for which we have to get prepared, re-skilling and up-skilling ourselves, but above all, facing it with an open mind to reinvent our current roles, taking advantage of all the disruptive potential of these technologies.

The Fourth Industrial Revolution has the potential to raise global income levels and improve the quality of life for populations around the world.

Klaus Schwab, Founder and Executive Chairman of the World Economic Forum and author of "The Fourth Industrial Revolution".

Chapter 6: Practical Activity/Worksheet & Useful Tools

<u>Practical Activities</u>

1. **Practice the steps for an effective information search.**

   - Formulate the need for information.

   - Select the information sources. Use more than 3 sources.

   - Prepare the search and execute it. Practice with advanced search.

   - Evaluate the information obtained by completing the CRAAP Test.
     - Currency
     - Relevance
     - Authority
     - Accuracy
     - Purpose

   Use the digital version or PDF format and answer all the questions about the information obtained.

   Reflect on the search process, the sources consulted and the usefulness of the CRAAP test to assess the quality and reliability of the information obtained as a result of the search.

2. **Learn more tech terms.**

There are many resources available to learn IT terms. We propose you test your knowledge, practice and learn technical terms by taking quizzes.

Tech Terms Computer Dictionary (https://techterms.com/) is a website that offers a dictionary where you can search and learn IT terms, and test your knowledge by taking quizzes. There are many available and updated daily.

3. Test your Digital Competences.

The European Digital Competence Framework for Citizens, DigComp 2.1. (Carrero et al. 2017), developed by the European Union, offers a model to improve citizens' digital competences. This framework will allow you to self-assess your skills, identify gaps, set improvement goals, and identify training opportunities.

This framework identifies 21 competencies, in five key areas:

1. Information and data literacy

2. Communication and collaboration

3. Digital content creation

4. Safety

5. Problem solving

Use the *Test your digital skills* **self-assessment** tool to obtain a report with your score in each of the 5 areas mentioned. The results can be stored on their Digital Skills and Jobs Platform or Europass profile. The platform also suggests open online training opportunities to improve. The test can be taken multiple times to monitor progress. This tool is the outcome of a project funded by the European Parliament.

[Test your digital skills | Digital Skills & Jobs Platform (europa.eu)](europa.eu)

- Create an EU login, or enter it if you already have one.

- Answer the test.

- Check and download your results. You can do it anytime through your Platform profile.

- Explore the courses on digital skills proposed.

You can also look for a MOOC (Massive Open Online Courses) on one of the platforms available. MOOCs are distance courses, accessible via the Internet that anyone can sign up for and has no limit on the number of participants. Check platforms like: Coursera, EdX, MiriadaX, Future Learn and Google Activate.

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<u>Useful links</u>

- Glossaries and tech terms

  Wikipedia: https://www.wikipedia.org/

  Gartner: https://www.gartner.com/en/information-technology/glossary

  Techterms: https://techterms.com/

- The Fundamentals of Networking.

  https://www.ibm.com/cloud/learn/networking-a-complete-guide

- Free Basic Computer Skills Tutorial

  https://edu.gcfglobal.org/en/basic-computer-skills/

- MOOCs Platforms (Massive Open Online Courses)

  - Coursera: https://www.coursera.org/

  - EdX: https://www.edx.org/

  - Future Learn: https://www.futurelearn.com/

  - Google Activate: https://learndigital.withgoogle.com/activate/courses

  - MiriadaX: https://miriadax.net/home

- The Fourth Industrial Revolution Documentary

  Documentary: https://www.weforum.org/videos/documentary-the-fourth-industrial-revolution

  Short video: https://www.weforum.org/videos/the-fourth-industrial-revolution

  Webpage: https://www.weforum.org/focus/fourth-industrial-revolution

- Digital strategy of the European Union.

  Shaping Europe's digital future. Site https://digital-strategy.ec.europa.eu/en.

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