



Handout

# ECDL Full Standard

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*This handout has been written by students with no intention to substitute the University official materials. Its purpose is to be an instrument useful to the exam preparation, but it does not give a total knowledge about the program of the course it is related to, as the materials of the university website or professors.*

# MODULE 1: COMPUTER ESSENTIALS

**ICT**= Information and communication Technology

It comprises the study of methods to store, elaborate, share information through computer sciences

**HARDWARE** = includes the physical part of the ICT device

e.g. keyboard, screen, mouse

Computers can be either desktop PC, laptop, tablet, phablet

Other mobile devices are smartphone, media players, digital cameras

## COMPONENTS:

- **PROCESSOR (CPU** = Central processing unit); executes the calculations and the operations required and also controls all the internal processes and the peripheral devices.

It is made up by

- **ALU** (Arithmetic and Logic Unit): accomplishes all logical and mathematical operations
- **CU** (Control Unit): coordinates processes
- **CACHE MEMORY**: super-quick temporary memory in which the ALU saves data
- **PROCESSOR REGISTER**: it is the component in which addresses, instructions and values are stored
- **BUS**: it allows communication between the external and internal parts of the computer

The power of the device is defined in terms of velocity of the processor

Such velocity is calculated on the base of an internal **CLOCK** in the computer that emits signals regularly

The clock's frequency measured in Hertz (Hz) corresponds to the number of operations that the processor brings about in 1 second.

At the moment, devices can run up to 3GHz, that is 3 billion cycles per second

- **RAM MEMORY** (central memory): it is the quick access memory, "random access" and volatile. That means, when data are no longer necessary, or when the computer is shut down or when blackouts occur, data are deleted

It does not have mechanical parts - all components have the same access velocity. This allows to maximise efficiency

Current capacity:	2-4 -8 -16 GB	(Pc)
	1-2 GB	(Smartphone)

- **MASS STORAGE** = type of memory in which data and programs are permanently stored (until the user does not delete them or supports are damaged). Several types exist. These include: HARD DISK, PEN DRIVE/USB, MEMORY CARD, CD, DVD

- **PERIPHERALS** = devices connected to the computer that allow the user to interact with it

They allow to insert data (input) obtaining a result (output)

Can be both integrated or external. That makes the classification quite shallow, as integrated devices can often be multifunctional.

INPUT: keyboard, mouse, touchpad, scanner, webcam, microphone, trackball, touchscreen

OUTPUT: screen/monitor (either LCD = liquid-crystal display or CRT = cathode-ray tube), printer, speakers, docking station (used to cool down the PC or increase the number of doors), touchscreen

**MEMORY** = support through which the computer stores data

2 types of memory are present

- CENTRAL, which is divided in
  - ROM (Read Only Memory = the part of the PC in which it is stored the component of the OS that is necessary when starting the computer)
  - RAM (Random Access Memory = memory of the computer where data that can be useful in a specific moment are used)
- MASS STORAGE = supports on which files and programs can be saved permanently

RAM and Mass storage memory have an impact on the device's performance: the greater the RAM, the greater the velocity. The access to data in the mass storage memory depends on the type of support. These can come in two forms:

HDD = Hard disk drive. It has mechanical components and a low velocity of access

SSD = Solid state disk. It is made by a chip of flash memory such as RAM. However it doesn't automatically deletes when the electricity is cut off. It has a high access velocity

**PORTS** are both of input and output. E.g. ports on desktop PC are parallel, serial (rather slow, substituted by the USB), PS/2 (used for keyboard and mouse), USB, video, network

The most common are:

- USB (Universal serial bus): it allows for a rapid transfer of data (600 Mb per second). 3 types are available – standard, mini, macro
- HDMI (High definition multimedia interface): transfer of audio and video in HD through DVD players/blue-ray, decoders, tv in HD, computers

## SOFTWARE

= untouchable part of the computer. It is the set of procedures and instructions that allows the device to work and perform specific actions. It is a set of several programs:

- **OPERATING SYSTEM (OS)** = it is vital for the functioning of the device and its hardware components. It is usually installed locally on the device, It controls the basic operations as well as all resources  
It is loaded on the RAM when the computer starts  
It is made up by a central part, known as the KERNEL (for basic activities) and several other programs: FILE SYSTEM (interacts with mass storage devices), VIRTUAL MEMORY MANAGER (manages the spaces in the RAM memory), PERIPHERALS MANAGER, SPOOLER (used to direct printing processes), SCHEDULER (multitasking), SHELL (user interface)  
User interacts with the OS through an interface. In modern computers it is a **GUI** = Graphical User Interface

Main operating systems:

⇒ Computer: WINDOWS, macOS, LINUX, UNIX

⇒ Mobile devices: WINDOWS PHONE, iOS, ANDROID, SYMBIAN, BLACKBERRYOS

- **APPLICATIONS** (Used to pursue the actions the user chooses. Can be available both online and locally.)

e.g. word processor, spreadsheets, presentations, database

browser (internet explorer, Google Chrome, Mozilla Firefox, Apple Safari, Opera)

mail, communication (telephony, instant messaging)

multimedia (iTunes, Quick Time, Windows Media Player)

Social networks, videogames, antivirus, specific applications

**EULA = end-used license agreement**

License contract is viewed on the screen when an application is installed. That includes use limitations, warranties, responsibility

TYPES OF LICENSE

- PROPRIETARY LICENSE: users buy it to use the software. It excludes all rights for the user. Examples are TRIAL VERSION, SHAREWARE LICENSE (Spotify), FREEWARE APPLICATIONS (free)
- OPEN SOURCE SOFTWARE: the software can be used and edited as it is completely accessible. Modified/improved versions can be redistributed freely

**STARTING** – desktop: icons, directories, files, windows explorer, network, trash  
Drag and drop mode is available (left click)  
If the screen is not integrated it is necessary to turn on the monitor  
During the computer starting, the OS is loaded in the memory (BOOT PHASE)  
User account is selected

## DESKTOP

Icons: can choose order, dimensions, order automatically, align functions

### TASKBAR

- Windows button / Start Menu
- Active applications
- ENG button (to change the keyboard settings)
- Bar of messages

**RESOURCE LINK:** right click in any part of the desktop. Select the function. Specify the file's position.  
If the link is deleted the resource is not deleted as well  
Follow the path: right click – delete/CANC button – move into the Trash folder

### WINDOWS

TITLE BAR (in the upper part): application name and file name  
MENU BAR (in the upper part, below the title): a series of menus available (e.g. file, edit, layout, view)  
STATE BAR (in the bottom): e.g. in Notes and Words it shows the number of words, lines  
FLIP BAR (can be both vertical and horizontal)  
APPLICATIONS BAR (can only be found in Office applications): set of buttons  
Windows can be downsized as desired

Online guide can be accessed anytime: START – Guide

### CONTROL PANEL

- SYSTEM: hardware and software characteristics of the PC (can be accessed from icon COMPUTER, right click, properties)
- AUDIO
- SCREEN
- TIME AND DATE (or click on the desktop's clock)
- KEYBOARDS AND LANGUAGE
- PROGRAMS and functions – accessed to de-install an application

**TASK MANAGER** – when an app doesn't work properly access this – right click on the application bar

### Connect and disconnect USB

- File explorer – computer. See what devices are connected
- Notification bar – secure removal

### SCREENSHOT of the active window

- SNIPPING TOOL (Windows application): follow the path Start – program list – accessories
- COMBINATION: STAMP (all the background is selected) or ALT+STAMP (active window)

It is possible to paste the image or can be saved on the device

TXT EXTENSION – opened with NotePad

Copy: CTRL+C

Paste: CTRL+V

Print: Start Menu – Printers and devices. In Windows you already have pre-set printers. Can install the driver.  
De-install a printer: right click  
Manage the PRINT SPOOLER: select the printer, view the prints in wait, suspend, resume, cancel

## FILE MANAGER

Windows explorer application (application bar/start menu/all programs – accessories/computer applications)

Can distinguish one disk from another through the capital letter followed by a column

STARRED/FAVOURITES: section along with desktop, download, local files, libraries

Can show icons viewing all details

Right button – Properties (More information on the file) – READ ONLY mode applied: file cannot be modified  
It is possible to rename files or create a new directory

File manager – NAME button – can order the list in ascending fashion (alphabetical, type, dimensions, last edited)

Select more contiguous files: select a file, MAIUSC, browse down

Select several non-contiguous files: select a file, CTRL, select another file

DRAG AND DROP mode (if you move one file on another disk, it is copied)

Cancel a file: right click – Delete/CANC

Data are developed as sequences of BIT (binary digits 0,1)

8 BIT make up a BYTE

Byte is the unit of measurement of the file's dimension and the memory capacity. A byte can be combined in 256 (from 2 to 8 digits) different symbols and digits. Can have Kilo, mega, giga, tera, petabytes.

Support devices (different storage capacity, access velocity, transportability):

- **HARD DISK**/Fixed disk/Rigid internal disk: dimensions of Terabyte order. Non transportable, optimal access velocity (especially if SSD)
- **INTRANET**: terabyte, non-transportable, access velocity linked to connection type. It is the hard disk of the server
- **EXTERNAL HARD DISK** (both mechanical or SSD): terabyte dimensions, transportable, good access velocity (especially if SSD) if connected through an USB 2.0, optimal if connected through a USB 3.0. Big dimension. Doesn't require a player
- **PEN DRIVE**: 128 Gb, portable, good (USB 2.0) or optimal (USB 3.0) access velocity
- **DISKS**: transportable, can be used through a player
  - o **CD (compact disc) / CD-ROM**: 650 or 700 Mb, sufficient access velocity. Can be re-written only if it is RW type
  - o **DVD (digital versatile disc)**
  - o **BLU-RAY DISC (BD)**
- **MEMORY CARD**: about 128 GB, transportable, can be used through a player, optimal access velocity. Magnetically based technology
- **ONLINE STORAGE UNIT**: storage such as cloud computing (allows to access several resources), decentralised, safe, easy to access

Verify the memory capacity of a support device to see how much space is left:

Windows explorer – computer – click on the support with the right click – properties

**COMPRESS/ZIP** one or more file: click with the right click – send to – compressed archive file (Windows 7 algorithm). If more files are compressed it is then necessary to rename the folder (there are several applications to compress)

**EXTRACT FILES**: Extract all files – OR – right click, extract all – then select the folder from which files are extracted

Extract a **UNIQUE** file from the compressed archive file: drag and drop the file on the desktop. A copy of the file is created

**COMPUTER NETWORK** = communication system between one or more electronic devices with the aim of:

- Share hardware/software resources or connectivity
- Access common data saved in a single place (avoid duplicates)

**Risks:** data safety, malware

Reduce the risks: only authorized users can access (USERNAME, PASSWORD)

## NETWORK CLASSIFICATION

- 1) Connectivity type between devices and peripherals
  - o **WIRED connection** based on cable, copper, optical fibre
  - o **WIRELESS connection:** based on radio waves (WIFI, Bluetooth)
- 2) Based on hierarchical structure (i.e. the relationship between devices)
  - o **CLIENT-SERVER:** powerful computer (server) that makes its resources available to other devices (client)
  - o **PEER TO PEER (PtP):** network in which each computer can be either server or client, offering and using shared resources
- 3) Extension based (territorial, geographical)
  - o **WIRED connection**
    - LAN (Local Area Network):** few computers in a limited area (class, office)
    - MAN (Metropolitan Area Network):** network connecting computers in one or more cities
    - WAN (Wide Area Network):** network extended on a huge geographical distance
  - o **WIRELESS connection**
    - WPAN (Wireless Personal Area Network):** individual network, personal devices - Bluetooth smartphone
    - Wireless LAN:** LAN connected through Wi-Fi
    - Wireless WAN:** network realized through wireless technologies able to cover huge distances

## INTERNET

= set of public access networks around the world and connected between different countries through phone lines and other technologies - digital data are sent and received

Services:

- o **WORLD WIDE WEB** = Informational space made up of files and web resources connected through hyperlinks that can be found through the browser
- o **EMAIL** - allows to exchange messages attaching several types of files
- o **INSTANT MESSAGING:** System that allows to exchange short messages in real time
- o **VoIP (VOICE OVER INTERNET PROTOCOL):** video/audio calls

**INTRANET** (firms or public services, offices In the same building)

**VPN (Virtual private Network):** used by firms that are decentralised. Data travel encrypted, as the VPN is a private communication network that exploits a public infrastructure (internet)

Measuring network performance: BITxSEC (measure unit of velocity of data transmission)

Asymmetric connection (ADSL) has high DOWNLOAD velocity, slow UPLOAD velocity

**ISP = Internet Service Provider**

Provider of internet services. It is a society that sells on the market the access to the internet. A subscription is necessary to access services through a connection to the server

Before subscribing a contract, it is necessary to consider the costs (which can be flat = monthly fee to be paid even though the service is not used), maximum upload and download velocity guaranteed, limitations in the quantity of data that can be downloaded, type of connection

## Connection to the Internet

- ⇒ **FIXED PHONE LINE**
- ANALOGICAL connection (modem dial up internal or external that transforms the digital signals of the computer in sounds to send them to ISP's phone number.
- ISDN connection (Integrated services digital network): faster modems that use digital data phone lines. Can run up to 64 kbit/sec - 128 kbit/sec
- ADSL (Asymmetric digital subscriber line): external modems that use a BROADBAND. Can run up to 640 kbit/sec - 20/30 megabit/sec
- ⇒ **MOBILE TELEPHONY**: mobile phones of at least second generation, pen drives, pc card
- **3G CONNECTION**: third generation mobile phones, velocity similar to the ADSL (4-5 Mbit/sec)
- **4G CONNECTION**: fourth generation mobile phones. Download can reach up to 3 Gbit/sec
- ⇒ **WIFI HOTSPOT**: wireless internet access. More and more frequent. Can be found in public places such as hotels, restaurants, bar, parks, malls
- ⇒ **TV CABLE** (much used in the USA) - can access the Internet through the TV cable
- ⇒ **WiMax Connection**: wireless connection, broadband, higher velocity and coverage of the Wi-Fi, almost non-existing in Italy. It allows to create broadband connections in those areas where it is not convenient for ISP's to use cables
- ⇒ **SATELLITE connection**: available on the entire planet, costly, used in those places which are isolated. It uses a special modem

It is easy to connect unauthorized devices to wireless connections.

Wireless connections can be OPEN (unprotected, accessible by everyone. no fee, no password) or PROTECTED/SAFE (access password required)

**PROTECTION: Risks** can come from unauthorized people accessing data, loss of data because of distraction, malfunctioning, malwares

To minimize risks:

- **Password** (Follow suggestions to make them safe)
- **FIREWALL** (Hardware or software device that monitors and controls the Internet traffic in order to avoid unauthorised access or malware intrusions. Personal firewalls are software available in the OS (e.g. Windows Firewall in Control Panel - System and Safety)
- **Periodical backup**: security copies. Firms backup is regulated by the Disaster recovery plans
- **UPDATE the software**: download antivirus, update the virus definitions. On windows, update management is in Control Panel

## MALWARE

(malicious software)= malicious software, created in order to cause damage, get data or gain access to private systems. Viruses are a particular type of malware

Malwares can infect a device by:

- Executing files such as exe or bat
- Opening attachments to a mail
- Using Infected mass storage
- Downloading files or software from the internet

### INFECTIOUS KIND OF MALWARES:

**VIRUS**: code parts that spread by being copied into programs or into the hard disk→ they run every time that the infected file gets opened. If you move the file to another device, the virus will spread there too.

**WORM**: programs that modify the operating system so that they run automatically using the internet. They don't need other files to spread. They use social engineering techniques or bugs in programmes.

**TROJAN** (trojan horse): software with licit purposes, but that contain dangerous information, unknown to the user

**SPYWARE**: software downloaded inadvertently, programmed to record and transmit personal data and information on the user's activity online. Doesn't show.

**ANTIVIRUS SOFTWARE:** it is specific; prevents, detects and removes malwares from folders, files and RAM memory. Must always be up to date. The updates follow the evolution of the malwares, otherwise protection cannot be 100% guaranteed. Sometimes antivirus may detect "fake positives"; it is then necessary to download the updated version. Usually this happens automatically. Other software need to be up to date too.

Signals that the computer might be infected

- Initial page is different from the one that was set by the user
- Internet popups
- When the computer starts, browser or other programs are opened automatically
- Some windows are opened automatically
- Emails are sent to all contacts

If the antivirus doesn't solve the problem, it might be necessary to **FORMAT THE DISK** - delete the entire content

## ERGONOMICS

It is the science that studies the way human body interacts with technology, machines and workplaces. It is useful to safeguard people's health

Ergonomics gives behavioural suggestions to realise **USER FRIENDLY, SAFE, RELIABLE** devices, so that negative effects are minimised, by examining critical factors.

Devices are not dangerous per se but can be if they are used badly: it is necessary to have pauses (10 minutes per hour), move the eyes away about every 10 mins, do not stay seated during pauses, take care of airing, air-conditioning, light (possibly on the left) of the environment

### SCREEN

Light and contrast (need to be set so that is possible to see the screen without effort for the eyes)

Quality (shall be an LCD screen), dimensions (15" at least), resolution (= quality of pixels that are visualized, points need not to be perceivable, but not too small)

REFRESH frequency shall be high (60-120 Hz)

### POSTURE

Look at the screen perpendicularly

Seat needs to be adjustable and with a lumbar support for the back, as well as armrests

Keyboard shall be ergonomic and placed at the same height of elbow

Mouse should be ergonomic and at the same height of the keyboard

## ENVIRONMENT PROTECTION

Devices are considered as RAEE (Electrical and electronic machinery trash). These are dangerous contain potentially toxic substances and are not biodegradable

In Italy a tax has been put, starting from 2005

To recycle, it is necessary to bring the devices in the shops where they were bought

### Manage energetic resources of the computer

Start - control panel - power management options - power management (reduces PC performances) or balanced (PC decides whether to use high performance setting or power management) or GRADUAL SHUTDOWN (after some time, can set a degree of luminosity based on the power source used, screen dimension, computer suspension)

### AIDING people with hearing, eyesight, mobility problems

Start - control panel - Accessibility centre - Programs such as Vocal assistant, high contrast, magnifying glass, keyboard on screen (physical interface that can be used through voice recognition or other similar devices)

## MODULE 2: ONLINE ESSENTIALS

**INTERNET:** network of worldwide informatic connections. Allows connection and communications. Many LAN networks connected→ wider networks (WAN) connected to even bigger networks (backbones), which are high speed lines.

**HYPERLINK (LINK):** hypertext link→ reference from a unit to another on a digital support. It is characterised by graphic signals (underlines). The link gets activated by a mouseclick, then gets visualized.

**WORLD WIDE WEB (WWW):** the whole of all the hypertextual and multimedial pages that you can surf through specific applications. Allows sharing.

**UNIFORM RESOURCE LOCATOR (URL):** sequence of characters that univocally identifies the address of a resource on the internet. You find it on a hot server.

**WEB SITES:** hosted on servers, when they have an IP address (internet protocol, a sequence of four numbers between 0 and 225 separated by a dot) you can reach them by the internet. The IP address identifies univocally any device connected to the internet.

**DOMAIN NAME SYSTEM (DNS):** service which associates an URL to any IP

### WEBSITE ADDRESS:

made up by two parts: FIRST LEVEL DOMAIN (the website's kind of domain) + SECOND LEVEL DOMAIN (company, institution or topic of the site).

→ Examples of first level domains:

- **it, fr, de, uk, es:** state indicators
- **com, biz:** commercial organization
- **gov:** government institutions
- **org:** no profit organization
- **info:** information companies

**BROWSER:** application able to browse the hypertext pages on the web. Examples: internet explorer, mozilla firefox, google chrome, apple safari.

The web gives informations and provides services, for example:

- o e-commerce
- o home banking
- o e- government
- o distance learning

### ONLINE PROTECTION TOOLS:

**HTTPS PROTOCOLS:** safe version of the http protocol→ before transmitting data to one device to another, it crypts them so that only the receiving website can read them.

When purchasing online, you must be sure that the website is safe; you can do that by reading other clients' feedbacks, and if there are none you must do a screening.

When you are done with a website you must log off.

**DIGITAL CERTIFICATE:** document that proves that the sender of an e-mail or a website owner really is who he claims to be. It is used together with the https protocol. When speaking of economic transactions, for example, it is compulsory.

You can view the digital certificate by clicking on https (website address bar)→security→view certificate.

The access to contents online may not be full→ minors cannot see certain websites (parental control: techniques tha filter webpages contents); inside companies or institutions, if the network traffic is excessive it could make the whole system slower.

## WEB NAVIGATION

To view a web page: access to a browser→ type the wanted webpage's address in the multitask bar.  
To edit the home page (starting page of the browser): three dots icon in the top right corner→settings menu→start

**ADVANCED SETTINGS:** three dots icon in the top right corner→ settings menu→ show advanced settings→privacy→ content settings:

**cookie** (website settings, managing exceptions): file where nativating preferences are stored

**pop up** (website settings, managing exceptions): windows that show up when opening websites, ads Window on the left, settings:

browser informations→ "get assistance" button→ online assistance

layout: to choose the settings to show in the multifunction bar

privacy: delete browsing history, downloads, cookies, pictures and cache files, permissions, data

**CACHE:** folder which temporarily stores files connected to the navigation. This allows for a faster navigation experience, but saturates the device's memory.

**BOOKMARKS, FAVOURITES:** bookmarks manager. On Google Chrome:

multifunction task bar: "add to favourites button" (star)

three dot icon on the top right corner: favourites→ favourites settings

folders menu→ new folder

new folder→manage

### TO DOWNLOAD FILES AND TEXTS ON THE DEVICE:

FILE: save→ download/ right click→ save as

PICTURES AND TEXTS: copy and paste/ save (in a folder or on desktop)

SEARCH ENGINES (for example Google, Bing or Yahoo): allow you to reach websites without knowing their address.

The search engine can receive informations either in a passive way (by simply receiving data from websites developers) or actively (softwares called spiders: search for new pages to add to the database). The algorithm that selects the informations, also organizes the sites. Each search engine has its own algorithm.

**TOOLS BUTTON:** language, date.

**CANCEL BUTTON:** takes every research filter off

**TO RESEARCH A QUOTE:** write it under quotation marks

Since on the internet it is possible to write whatever comes to your mind, it is also easy to manipulate informations, so anything must be read with a critical mind.

Factors which allow for so many informations to be on the internet:

informations (newspapers)

entertainment

propaganda

commerce: companies websites, ad websites

### TO VERIFY INFORMATIONS:

checking the author's authority

checking the sources

confronting informations on different websites

contents must be up to date

**COPYRIGHT:** laws that guarantee an author's rights→ an author has exclusive faculty of spreading what he did produce.

**COPYLEFT** (1984): free software.

On the internet, it is easy to download files→ this doesn't mean it always is licit. You always need to know the licence. It is a right protected by the law. In Italy: law 633, 1941: it's about intellectual products such as literature, music, figurative arts, architecture, theatre, cinematography, photography, software, database, technical drawing products.

The only way to be sure something is free is for it to be stated in the licence. In order to be subjected to copyright, it is not necessary for a piece to be registered or to show the © symbol.

## ONLINE/VIRTUAL COMMUNITIES

groups of people interacting thanks to services provided by the internet (for example forums, chats, games, social networks). Everyone can use his own identity or fake another.

- **forum**: board, message board, bulletin board, discussion groups→ informatic structure based on webpages that allow for interactions. They need a database and are accessible via browser or specific apps.
- **online games**
- **chats**: to communicate in real time
- **social networks**
- **videoconferences**

### TO SHARE CONTENTS ONLINE:

- blog (web+log: online diary) → text, pictures, videos
- microblog: short text messages→ twitter: 140 characters
- podcasts (pod+ broadcast: personal on demand broadcast) → thanks to a subscription (RSS feed), and thanks to a program able to receive them (aggregator), automatically downloads contents available online.
- pictures: social networks such as flickr
- audio clips
- video clips (Youtube)

## PRIVACY

in virtual communities you don't know the other user's real identity. You must:  
set your privacy settings so that only contacts/friends can see your data  
using private messaging  
never share your position or personal data  
block and report unknown users

**INSTANT MESSAGING**: sharing in real time short sentences, files and audio. Synchronic exchange. It is different from forums, e-mails and private chats.

You need an account and a client program who is able to interact with the server.

SMS: short message service→ characteristics: cheap, you can read again messages even after a long time, mobile phone based

MMS (multimedia message service)→ characteristics: files, expensive, mobile phone based

**VOIP**: voice over internet protocol→ transmitting the voice through the internet= calling other computers or phones through servers and internet connection instead of using telephone lines. With the VOIP the phone call is converted in digital data and passes through data networks. Pros: cheaper.

**NETIQUETTE**: series of rules when communicating online:

short messages, in order to not waste time

accurately filing the object of a message, so it is easier to recognize its content

not sharing irrelevant details which could lead to the user's personal data

no inappropriate contents

checking the body of a message to avoid mistakes

check attachments

not sending CC messages to more than one person, so to not reveal other users e-mail addresses.

## E-MAIL

Electronic mail. It allows you to communicate, and comparing to traditional mail it is faster, free, it allows you to attach files, you can check it by simply connecting to the internet from any browser.

E-mail address: username@address (domain name of the organization which provides the e-mail service; a server is connected to the domain).

Attached files: they not always get to the receiver because of size limitations→ to bypass this problem there are web spaces such as jumbo and yousendit.

Ways to specify the receiver:

to (only one receiver)

CC (no main receiver, the message is copied)

CCN (hidden copied, the receiver gets the message without the others' knowledge)

### E-MAIL CONNECTED RISKS:

spam: unwanted ads; anti spam filters: may think legitimate messages are spam. Spam messages must be immediately deleted, without opening or answer.

Malwares: can be hidden in attachments

**PHISHING:** attempt to gain sensitive data from a user, faking a message from an institution with the user's credentials→ the user doesn't know it is a stranger.

How to recognize phishing:

no institution asks for data confirmation via email

often the language is not the same as the user's (or the translation is not good)

usually it contains a link identical to that of the institution, the server, however, has a different domain name.

The phisher doesn't know who is sending messages to, so a part of them gets to actual clients of that institution.

### SENDING/ RECEIVING AN E-MAIL:

Settings button:

online guide

settings menu→ signature settings

settings menu→ to personalize labels

settings menu→ general settings→ to set an automatic reply to messages

Tick sign on the message→ other: mark as unread/read/important

Settings button: settings→language, number of mail visualized on each page, show pictures, phone number.

On Gmail you can not order messages for name or date, you can only create labels→ folders, you add e-mails via drag&drop, you can change the colour of the label or create underlabels)

Spam: doesn't open pictures.

### GOOGLE CALENDAR:

create→new event. You can add invitations or be invited; you can choose whether you want to participate or not→ by saying yes the event is shown normally, by saying no it disappears.

# MODULE 3: WORD PROCESSING

**SAVE AS** → extension:

- word document
- word document with macro activation
- word 97-2003 document
- word template (to take advantage of markers and formatting and use them in order to create similar documents)
- PDF
- rich text format (exporting while keeping all the formatting options)
- normal text (only save the text, extension is .txt)

Right click → makes the top ribbon collapse

icon in the top right corner → to hide the top ribbon and the title bar

view page: zoom commands

file → word options: username of the word application, saving page, help function (lightbulb icon), online guide (opens a webpage)

**DIFFERENT WAYS OF VIEWING A DOCUMENT:** three icons at the bottom left corner: printing layout (central one), reading mode (left one), web layout (right one)

- View page: different viewing modes:
- printing layout: default view
- reading mode: take anything that's not a reading element off, making the page look similar to an e-book. You can't edit your document, it is only possible to highlight and write comments on it
- web layout mode: the text takes over the whole width of the page as if it was a webpage, occupying all the available space. This doesn't mean that everything will correspond exactly to the actual view on the website.
- structure view: focuses on the bigger components of the document → paragraphs, chapters, overall structure. To go back to the printing layout viewing mode, click on close
- draft

**TO ADD SYMBOLS:** click on the exact spot where you want it to be, insert menu → symbols dropdown menu  
font: every symbol comes in all characters and formats

**TO ADD SPECIAL CHARACTERS:** insert → symbol menu → other symbols → special characters page

**TO SHOW NON PRINTABLE CHARACTERS:** home → paragraph options → paragraph symbol

non-printable characters: symbols added in the text just for technical purposes (s.a.: spacing) but will not be printed.

**TO SELECT TEXTS:**

right click → selects word

three clicks → selects the whole paragraphs

to select the whole document: home page → select → select all

alternative: click three times on F8

Instead of copying and paste a text, you can select it and move it in drag and drop mode

**TO FIND TERMS:**

home page → edit → find command → write the word you want to find

**TO SWAP WORDS:**

home page → edit → substitute command → a window will open, write the term you want the program to find and the one you want it to be substituted with

The research start from the point your cursor's at

**FORMATTING:** home page→character command:

next to the the number which shows the character's dimensions there is an "A" with an arrow pointing either upwards or downwards→ makes the text of a selected part of the document grow bigger or smaller according to certain proportions

Under the character's dimensions there is an "x" with superscript/underscript→moves the selected character to superscript/underscript

"Aa" button→ turns your text in caps lock

**TO SEPARATE A WORD INTO DIFFERENT SYLLABLES:** (at the end of a row)

layout→ page settings→ syllabation (none, automatic, manual)

**TO INTERRUPT A LINE** (arrow pointing upwards to the left): character that gets added automatically and makes you start a new line while staying in the same paragraph. Caps lock button+ send

**TO CREATE INDENTATIONS:**

home page→ paragraphs→ widen/reduce indentation

layout→paragraph→ you can manage the indentation by adding the exact indentation measures

triangles on the ruler at the top of the screen: slide in drag and drop mode. The left indentation is either a first row indentation, and protruding indentation

layout→paragraph→paragraph settings

**VERTICAL SPACING:** layout→ paragraph layout→ line-spacing

**HIGHLIGHTING:**

home→ paragraph→ coloured background

home→ paragraph→ borders (background and borders window)

**ALIGNMENT:** TAB button

four different ways of aligning a text: to the right, to the left, central, according to the position of the comma  
choose the kind of tab: symbol to the top left next to the vertical/horizontal ruler→click on it

**Combinations of predefined formats:** home page→style command

**TABS:**

add→ tab (adapt to the content/ to the page/ to a certain fixed width of the columns)

to see the horizontal extension of the columns:

ruler

select the column→layout→cell dimensions

**TO ADD NEW ROWS OR COLUMNS:**

layout→ rows and columns

place the cursor on the row/column

**TO DELETE A CELL:** move to the right/left/upwards/downwards

**BACKGROUND AND BORDERS:** projecting

→ The backspace button deletes the whole tab (if selected), the CANCEL button only deletes the content of the tab (if selected)

**GRAPHICAL OBJECTS** (pictures/shapes/graphs):

add→ illustrations

histogram: series= vertical axis; category: horizontal axis

**TO DELETE THE BLANK SPACE IN THE GRAPH:** projecting→ select data

**RESIZING WHILE KEEPING PROPORTIONS:** select the object→ format→dimensions→ block proportions  
option or right click→ other layout options

## MERGE PRINTING

to match a template to a name list

letters→ merge printing, six steps:

1. letters, email, cards, labels, lists
2. choose the preferred document
3. select the list of the recipients
4. write the letter: put the non-printable characters→ click on the inserting point→ click on "other"→ choose the fields to add Or letters→ insert fields→ insert merge field→ select the field
  - a. To make it personal: top right: title, name, surname, address, zip code, city
  - b. beginning: opening, title, surname
  - c. collecting point
5. letters→ result preview
6. to complete the merge:
  - o printing→ does not create a new file but directly prints the original one
  - o edit the single letters→ new document

**LAYOUT**→ page settings: orientation, borders

Top part of the document: HEADER, bottom part of it: FOOTER

insert→ header/footer

**WORD FIELD:** to add author, date, document's name

Once you add the header, if you go on projecting→add→date and time, it will automatically update to the one at the opening of the file

Footer: page number (insert or projecting)

Red dots (error): by right clicking on the word, the program will suggest corrections.

Language: revision→ language

Error correction: revision→ spelling and grammar (grammar mistakes and repetitions)

## SHORTCUTS:

CTRL+ RIGHT/LEFT ARROW: to move one word away to the right/left

CTRL+ DOWNWARDS/UPWARDS POINTED ARROW: to move downwards/upwards of a paragraph

CTRL+ HOME/END: to get to the beginning/the end of the document

PAGE UP/DOWN: to go to the next/previous page

CTRL+ PAGE UP/DOWN: to go at the beginning of the previous/following page

**GO TO COMMAND:** home→ edit→find→go to

allows you to move into the document

**HYPertext LINK:** insert→ link. To reach the web page or the file you need to push on CTRL and on the word

**FRAMING PARAGRAPHS:** home→ paragraph→ background and borders

**INDENTATIONS AND SPACING:** home→ paragraph→ ruler

**SAVING A DOCUMENT:** SHIFT+F12

# MODULE 4: SPREADSHEETS

When using Excel, files are called folders.

To open a file: file (top left corner) → open → browse

Folders can either overlap or justaxpose

**TO SHOW ALL THE CURRENTLY OPEN TABS:** ALT+ TAB → I

**TEMPLATE** → predefined scheme that enables you to create other documents

On excel templates do not open as normal files → if you double click on the name of the template, the program will open the file which used that template

To open a template:

file menu → open → browse

right click on the name → open

DON'T double click, otherwise it will not open the template but the specific file

**TASK BAR:** file management and program's options. Everything that is set on default can be modified.

**OPTIONS:** save, writing layout (font, dimensions, general view, number of pages)

You can ZOOM on the page → zoom button on the bottom right/visualization menu)

**TO COMPRESS THE TASK BAR** → right click on the task bar

Every cell can contain only one kind of data

empty row that divides data from the total:

insert the information in a cell → words get aligned to the left, numbers to the right, dates to the right

The mouse on the cell becomes a white cross → click with a white cross means selecting

- selecting adjacent cells → left click and select
- selecting non adjacent cells → CTRL button + left click. Keep clicking on the CTRL button only AFTER selecting the first cell
- to select a row → select the numbers on the left
- to select a column → select the column on top
- to select the whole → top left triangle

**FIND AND REPLACE:** (home tab → bottom left)

**TO SORT OUT CELLS:**

- home tab → edit tab → filter and sort
- data tab → filter and sort tab
- to sort out you only need to select a cell, not the whole column

**TO DELETE THE CONTENT OF A CELL:**

- CANC
- home tab → edit tab → delete content

**MOUSE SHAPE:**

1. white cross → selecting a cell
2. double cross - staying on the cell border → moving a cell
3. viewfinder (automatic filling) - staying in the bottom right corner of the cell → copying the cell

**CUTTING AND COPYING A CELL'S CONTENT:**

- go on the border, just selecting and moving
- cut button
- right click

When you click on the cut button, the cell's border becomes dotted → to take the dotted border off, click on ESC

**TO DUPLICATE A PAGE IN ANOTHER FOLDER:**

Move/right click to copy → select the other file

**TO DELETE A ROW/COLUMN:** select it → right click/home tab → cell group → delete

**TO ADD A ROW/ COLUMN:** select TWO rows/columns → right click → a new row/column is added between the two previously selected

columns → added to the left, rows → added on top

You can add as many as you want, depending on how many you select.

**TO ADAPT THE CONTENT OF A COLUMN TO ITS WIDTH:** double click on the line between adjacent columns → adapt

OR select a column → right click → column width

**TO WIDEN A BUNCH OF ROWS/COLUMNS UP TO THE SAME WIDTH/HEIGHT:** select them all → right click → column width

Home bar → cell group → layout menu: same options to widen/heighten columns/rows

**TO PREVENT ROWS/COLUMNS FROM SHIFTING:**

view bar → windows group → stop frames button

blocking the upper row- keeps the upper row visible while the sheet shifts downwards

blocking the first column- keeps the first column visible as you shift left/right

blocking frames- keeps the row on top and the column to the left of the selected frame still

## WORKSHEETS

(tabs on the bottom):

the new worksheet is added to the left of the selected one

**TO RENAME A WORKSHEET:**

- double click
- right click → rename

**TO MOVE A WORKSHEET:**

- select and move it with drag and drop
- right click → move or copy

**TO DELETE A WORKSHEET:** right button

- delete and add are in the home bar too → cell group

**TO DUPLICATE A PAGE:**

- drag and drop whilst clicking on the CTRL button
- right click → move or paste → create a copy

## FORMULAS AND FUNCTIONS

every formula starts with =

multiplication: \*

division /

**COPY AND PASTE FORMULAS WHILE READING A CELL'S COORDINATES:** in the formula you must insert the coordinates which identify said cell

automating filling square → copy the formula in the adjacent cells

**TO CALCULATE RESULTS:** click on SEND

**ABSOLUTE REFERENCE** (doesn't change row nor column)- **RELATIVE REFERENCE** (changes only one between row and column)

When a part of the formula must remain constant while the rest shifts: you must add the \$ sign in front of the row/column that doesn't have to change  
F\$→ clicked on once automatically puts the \$ sign in front of both the row and column, twice only in front of the row, three times only in front of the column, four takes all the \$ off

## GENERAL FUNCTION SYNTAXIS: =functionname(argument 1; argument 2..)

the first argument is compulsory, the others are not

### SUM:

home→ summation symbol→ automatic sum button→ sum, average, average, number count, max/min, other functions

### PERCENTAGE:

=num1/num2

\* 100 is applied automatically

home→ numbers→ number of decimal figures

If you don't put a reference for division, it could lead to errors: you cannot divide for zero→ error message

### AVERAGE (arithmetic):

home→ edit→ summation→ average

### MIN/MAX:

home→ edit→ summation→ min/max

Adding a column, it gets added with a formatting identical to the others→ to delete such formatting:

home→ edit→ delete formatting

### NUMBER COUNT:

automatic sum button→ given a numeric area, it counts how many cells are filled by numbers (are not empty)

### VALUE COUNT:

given a certain area, counts how many cells contain an alphanumeric value→ written =count.value(...)

### OTHER FUNCTIONS:

automatic sum button

f(x) button on the formulas bar

multifunctional formulas bar→ add → function button→ the guide opens (window)

### ROUNDING OFF

it's a mathematical function

### IF FUNCTION

it's a logical function, made by three arguments: question, if true, if false.

You cannot insert spaces or number separators

If you add a text as an argument→ in the formulas bar the text must be inserted between double quote marks, otherwise, if it's written in the "insert function" window it doesn't work

**FORMATTING:** you must first select the area you want to edit;

- group of numbers: multifunctional home bar→ group of numbers→ dropdown menu, currency symbol, percentage symbol, separator style (thousands, adding of two decimal figures)
- accounting: the Euro symbol is to the left
- currency: the Euro symbol is next to the ciphers
- font group: giving the same font format to other cells: COPY FORMAT command
- select the cell→ copy format→ select the other cells

- alignment group:
- to start a new line inside a frame: home→ alignment→ new line
- to centre the text (vertically): alignment group→ horizontal bars icons
- home→ alignment→ MERGE AND ALIGN TO THE CENTER butto (it ends up being a single cell)

### GRAPHS (insert menu):

you must select the data you want to see in the graphs, other data can be added later.

- o categories axis: x
- o reference to the series: key

**TO MOVE A GRAPH ON A DEDICATED PAGE:** projecting menu→ move graph

**TO CHANGE THE KIND OF GRAPH:** projecting menu

button on the top right corner: adds elements (such as a title or labels)

Labels: if you want to change the value in the label, select it→ right click→ label format

**KEY:** can be moved either through drag and drop, either through→ right click→ key format

histogram: to change the colour of a single data: select the data→ right click→ data series format→ fill

pie chart: to change the colour of a single slice: double click to select it/right click/coordinate

### DIFFERENT KINDS OF GRAPHS:

**histograms:** to confront different values or categories→ categories: x; values: y

**bar graphs:** to confront different values or categories→ categories: x; values: y

**line graphs:** to show tendencies/evolution of series of numbers

**pie charts:** to show how much a series of numbers contributes to the total. Every slice represents a single percentage of the total. This kind of graphs can only be used with a series of numbers at the time.

**TO ADD ELEMENTS TO A GRAPH:** + in the top right→ projecting→ add element to the graph

**HEADERS and FOOTERS:** page layout→ bottom left square→ page setting

header: date (it gets refreshed every time you open the file), time, name, page, file

**GRAMMAR AND SPELL CHECK:** multifunctional bar→ review→ formulas→ error check

**TO DECIDE WETHER TO PRINT THE GRID OR NOT:** page layout→ bottom left square→ page settings→ sheet

**TO KEEP IN THE PRINTING CERTAIN ROWS/COLUMNS:** page layout→ little square in the bottom right→ page setting→ sheet→ print titles→ select them from the file

file→ print→ printing preview settings→ print the whole file/only the selected part/only the graph

When opening excel, you get showed different templates. Templates cal also be download.

**TO SAVE FOLDERS IN PDF/CSV FORMAT:** save→ browse→ save as→ choose the format

Since CSV is a text only format, and it only saves one sheet at the time (the last one ) you will lose all formatting

## KEYBOARD SHORTCUTS:

CTRL+ arrow: moving toward the edge of the current area of the page

CTRL+shift+arrow: extending the selection towards the edge of the area

CTRL+END: moving to the last cell, in the bottom row of the column further to the left

CTRL+ HOME (or + inclined arrow): moving to the beginning of the page

CTRL+ PAGE DOWN: moving to the next page of the folder

CTRL+ PAGE UP: moving to the previous page of the folder

**TO REACH A SPECIFIC CELL:** home→ find and select→ GO TO tool

**TO REACH A SPECIFIC CELL IN A RANDOM SHEET:** PAGENAME! Cell reference

**TO COPY/MOVE A PAGE IN ANOTHER FOLDER/ TO RENAME A PAGE:**

right click on the name label→ move or copy/rename

home→ cell group→ format→ move or copy/rename

#VALUE! =message VALUE ERROR

**TO DELETE:** right button or cancel (NOT backspace)

# MODULE 5: IT SECURITY

Data are numbers, pictures, words, simple/unrefined elements that represent facts or events  
Informations are data which are already organized, processed and synthesized, in order to be understandable and meaningful to the user.

## COMPUTER CRIME

illicit or illegal activity carried on by electronic instruments (it is prosecuted by the Italian legislation);  
examples of computer crimes are unauthorised access, cyberstalking/cyberbullying, catfish, manipulation.

### HACKING

actions aimed at knowing, editing or controlling an hardware or software system, by bypassing or overcoming its limits and access controls.

The kind of hacker depends on its aim:

- BLACK HAT/CRACKER: who accesses a system in order to get some personal advantage;  
theft/damage: CRACKING
- WHITE HAT: who, as a job, verifies a system's safety, resistance or reliability in order to make it better → ETHICAL HACKING
- GREY HAT: people who violate the safety of a system, of a website or of a company in order to discover its vulnerabilities, acting WITHOUT previous consent.

**SOURCES OF THREAT FOR DATA:** fraudulent or accidental:

PEOPLE (individuals, service providers, organizations) → editing or cancelling, theft, unauthorised access

UNPREDICTABLE EVENTS → natural events (ex: fires), deliberated attacks (vandalism, terrorism, war)

CLOUD COMPUTING → data given to third parties in order to achieve them on remote servers (control on data, privacy loss)

**FUNDAMENTAL ELEMENTS OF THE INFORMATIONS' SAFETY:**

**INTEGRITY:** informations must be integral, complete, coherent, reliable and without differences from the original.

**PRIVACY/CONFIDENTIALITY:** the informations must not be spread out to unauthorised people, and access should only be granted to authorised individuals.

**AVAILABILITY:** informations must be available when needed.

You should protect both your personal informations and your work informations. Companies are responsible for their clients' data.

## PRINCIPLES FOR DATA PROTECTION, CONSERVATION AND CONTROL

(defined by european regulations)

TRANSPARENCY: the user has the right of being informed on their data.

LEGITIMACY: the purpose of the use of data must be explicit and legitimate. Data can't be further processed.

PROPORTION OF THE MEASURES COMPARED TO THE DAMAGE: safety protocols must be proportioned to the real risk of losing data.

**DATA CHECKER:** whoever processes someone else's data.

**INTERESTED SUBJECTS:** people whose data gets processed.

**PRINCIPLES THAT GET APPLIED:**

TO CHECKERS: data must be obtained and treated fairly, stored for specific and legitimate purposes, NOT be used or divulged in a way that is excessive compared to the effective purpose.

TO SUBJECTS: right to be informed and to receive clear informations, to know the source/finality/mode of data treatment, informations on the checker or third parties who could receive the data, in order to

cancel/update/edit/integrate data, or to legitimately go against the use of their data. If the checker doesn't act legitimately, the subject can act legally.

The guide lines fix minimum standards on user's conduct and on measures to adopt when managing data. The law asks companies to create disaster recovering datas→written policies that the interested subjects need to know. This kind of policies can be about organizations, informations or logistics, with the purpose of reducing the risk of loss, unauthorised acces, unauthorised treatment.

## TECHNIQUES TO GAIN ACCESS TO PERSONAL INFORMATIONS:

- **HACKING**
- **SOCIAL ENGINEERING**: studying someone's behaviour in order to gain useful and reserved informations. It bypasses hardware/software informations systems. Can be carried out through:
  - o **PHONE CALLS**: disguised as anonymous surveys, often promising prizes.
  - o **PHISHING**: deceptive mails
  - o **SHOULDER SURFING**: spying the user's credentials by controlling him through lenses or cameras.

## IDENTITY THEFT

illicit appropriation of credentials to access to a service (in order to gain some sort of advantage or to commit computer crimes such as fraud or thefts). Other techniques not related to electronic devices:

- **INFORMATION DIVING**: to look in the rubbish or on desks, looking to gain informations thanks to objects or notes
- **SKIMMING**: cloning credit cards (using mobile payments devices in an illicit way)
- **PRETEXTING**: creating a situation (for example, pretending to be someone else) in order to steal informations→ phishing

**MACRO**: set of informations or commands written in a programming language (such as VBA= visual basic for application) which can be used to make long procedures shorter when using programs such as spreadsheets. They could contain malwares, if you are not sure of their source, you must turn on the ones you are certain of, and deactivate the other ones. The level of security can be set so the application will warn you if the file contains macros, and ask whether you want to activate them or not.

**CRIPTOGRAPHY/CYPHRING**: a way to enhance the safety of a file and protect the data: it is based on an algorithm that through a **KEY** converts the information bits. Makes all the data unreadable if you do not have the key.

Without the right key, it may take months to de-cypher the file.

If you lose the key, you lose the data.

If the cryptography process gets interrupted, data may get lost.

The application can cypher the data.

You can crypt a whole disc unit: control panel→ security system →disc cryptography command

You can cypher a folder or a file from EXPLORE RESOURCES

## PASSWORD

it is a milder form of protection than cryptograph. The file can be protected by unwanted accesses of unwanted edits → writing password/editing password

**MALWARE** (malicious software)= malicious software, created in order to cause damage, get data or gain access to private systems.

Malwares that can hide in a computer:

- **TROJAN** (trojan horse): software with licit purposes, but that contain dangerous information, unknown to the user
- **ROOTKIT**: software that takes control of the operating system, allowing someone else to access as admin; it also hides files or system information

- **BACKDOOR**: programs that allow unauthorised access, bypassing every security check. They can be created by the developers of a program in order to have the chance of logging in at all times, or they can be explicitly created.

#### INFECTIOUS KIND OF MALWARES:

- **VIRUS**: code parts that spread by being copied into programs or into the hard disk→ they run every time that the infected file gets opened. If you move the file to another device, the virus will spread there too.
- **WORM**: programs that modify the operating system so that they run automatically using the internet. They don't need other files to spread. They use social engineering techniques or bugs in programmes.

#### MALWARES USED TO STEAL DATA:

**ADWARE**: advertising-supported software. Software downloaded when surfing the internet or when downloading a free software→ unrequired ad messages appear

**RANSOMWARE**: malware that limits the access to the infected device (either blocking it or cyphering it); to end the limitation there is a ransom request.

**SPYWARE**: software downloaded inadvertently, programmed to record and transmit personal data and informations on the user's activity online. Doesn't show.

**BOTNET**: software that takes control of a network of devices→ the botmaster then uses them from remote to carry out unauthorised activities

**KEYLOGGER** (keystroke logging): software that intercepts and sends to a remote server the typed characters> SNIFFING

**DIALER**: software that changes the modem connection, going to another phone company which is more expensive. The phone number gets changed-

**PHARMING**

**ANTIVIRUS SOFTWARE**: it is specific; prevents, detects and removes malwares from folders, files and RAM memory. Must always be up to date. The updates follows the evolution of the malwares, otherwise protection can not be 100% guaranteed. Sometimes antiviruses may detect "fake positives"; it is then necessary to download the updated version. Usually this happens automatically. Other softwares need to be up to date too.

#### ONLINE TOOLS TO PROTECT FROM MALWARES:

- operative system websites
- antiviruses developers' websites
- web browser developers' websites
- authorities' websites

#### MICROSOFT SECURITY ESSENTIALS:

with an antivirus you can do specific scansions of more than one unit.

You can also use it from explore resources: select the elements→ right click→ analyze with Microsoft Security Essentials-

To plan a periodic analysis: settings→ planned analysis

Fake positives:to be sure they don't get authomatically deleted you can put them in "quarantine" (specific folder managed by the antivirus, they are made unusable)

#### INFORMATIC NETWORK

more devices that work togheter in order to share informations.

Connection: risks for the security of data:

- malwares
- unauthorised acces (due to bugs in the security system)
- difficulties in the defence/privacy of the data

## KINDS OF NETWORKS:

- **LAN:** local area network→ local and limited
- **WLAN:** wireless local network→local but wireless
- **WAN:** wide area network→ geographically very extended (ex: internet)
- **VPN:** virtual private network (intranet): virtual private network that in order to work uses a public network. It allows to connect in a safe way devices that are very far geographically. Through a VPN data gets crypted and need authentication

**NETWORK ADMINISTRATOR** (position in a company): makes the network safe and efficient, implementing policies concerning access to the resources  
manages the authentication, authorization and assignation of accounts to the users of the network  
verifies and installs upgrades  
checks the network's traffic (exchanged data)  
handles malwares

**FIREWALL:** hardware or software device that checks the network traffic (usually between the LAN and the Internet), using rules set by the admin in order to avoid undesired intrusions. Limitations:  
rules must be set precisely; otherwise it will not work efficiently  
if the attack comes from inside the LAN it will not work  
if it's not well programmed it may keep the users from legitimate actions

The Windows 7 operating system already has a firewall installed.

On Windows 7: safety system commands→windows firewall

advanced settings→ allows you to manage in a more dynamic and personalised way the stream of data through the firewall

## DIFFERENT KINDS OF CONNECTIONS TO A NETWORK:

**WIRE** (copper, fibre optic)→ cabled network, wire: more safe and efficient when transmitting data

**RADIO WAVES**→ wireless networks, wifi: pros= cheaper (doesn't need cables), can go even where wires can't reach; cons= unauthorised devices can get connected too (you need a password)

two kinds of wireless networks: open (unprotected, accessible by anyone) or protected (by a password)

## RISKS CONNECTED TO UNPROTECTED NETWORKS:

- **EAVESDROPPING:** intercepting conversations
- **NETWORK HIJACKING:** connect you to a dangerous site making you believe is the one you actually wanted to gain access to
- **MAN IN THE MIDDLE:** violating private conversations= someone secretly transmits or modifies the conversation between to parties who genuinely believe they are communicating with each other

## CRYPTING ALGORITHMS FOR DATA SENT BY WIRELESS NETWORKS:

WEP (1999, wired equivalent privacy)= privacy security level equivalent to the one offered by wired networks→ inefficient because the key is too short

WPA (2003, wifi protected access)= protected access to wireless networks

WPA2(2004): totally safe

## OTHER FORMS OF PROTECTION OF WIRELESS NETWORKS ACCESS:

**MAC FILTER:** mac address= media access control, specific address of the board which isolates a device. 12-cyphers code

**SSID HIDING:** hiding the SSID code (service set identifier, name with which the network appears to the user), low protection

**HOTSPOT:** wireless access point (wifi) that devices use in order to connect to the internet.

**TETHERING:** action of connecting one device to another in order to share the connection to the internet (personal hotspot). The connection can take place through: WLAN (wifi), bluetooth, cable (USB port)

**TO AVOID UNWANTED ACCESS:**

- username
- strong passwords
- PIN= personal identification number
- cyphring/crypting
- many authentication factors

**NETWORK ACCOUNT:** shown name, secret password → purpose:

identifying who within the network access to what (either software/hardware resources or data)  
defining at a central level the privileges (authorizations) that concern accessing/reading/editing  
tracking activities

The access to the network is granted after an authentication procedure. For safety reasons it is better to block or disconnect when the device is not in use; it is also better if the password gets typed every time

**PASSWORD CRACKING:** activity of identifying passwords for illegal purposes. Softwares may be used.

Guidelines to create strong passwords:

- do not use words, names, dates
- at least eight characters (very strong beyond fourteen)
- mix capital and non capital letter (passwords are case sensitive) and special characters. Avoid repetitions and accented letters
- do not share them or leave them around
- change them regularly
- different passwords for different accounts

**PASSWORD MANAGER:** using password managing softwares, they handle the organization of passwords.

They are stored in a crypted database and are only accessible through a particularly strong master password.

- Online password manager (web app's cloud)
- offline password manager (stored on the local device)
- manager integrated in the web browser.

**LIMITATION:** if someone manages to get access to the password manager gets all the passwords.

**OTP:** one time password, valid between thirty seconds and ten minutes. Used especially when transmitting financial data through the internet. Then can be:

- generated previously (disposable codes card)
- created on the spot by a disposable hardware device= token
- generated by an app on the smartphone
- sent by sms

**BIOMETRIC RECOGNITION TECHNIQUES:** used to check access to devices and places: system based on physical characteristics of the users - examples:

- handprints
- iris/retina scansion
- face recognition
- hand shape/geometry

A public network doesn't only get used for consultations, but for financial activities too (such as shopping or home banking)

To check if the website you are surfing is free, you must check if it uses the HTTPS transmission protocol (hyper text transfer protocol secure), and that there is the closed lock symbol (digital certificate)

https: data are transmitted crypted, SAFE TRANSMISSION

digital certificate: electronic document which clearly identifies the website author. SAFE AUTHOR

**PHARMING** (malware): it is an illegal technique which makes sure that, when typing a licit web address, you get directed to another one, graphically identical but illicit. If the illicit website requires for personal data, they get sent. Pharming does so that an URL address matches a different IP address. The server which

normally translates an URL in the matching IP is called DNS (domain name system). The only way a user can spot pharming happening is by checking the digital certificate of the website.

#### **TO CHECK A WEBSITE'S AUTHENTICITY:**

https  
digital certificate  
contents' and informations' quality  
last update (must be recent)  
URL validity  
clear informations on the owner  
safety certificate  
website validation by the owner

#### **PREVENTATIVE WAYS TO CHECK THE NAVIGATION:**

Internet filter: applications made to avoid the use of certain websites or the dowload of certain types of files.  
Internet use restrictions  
Parental control: planning when the children can have access to the devices and which applications they can use. It can be enabled by the control panel.

#### **HOW TO PROTECT FROM POTENTIALLY DANGEROUS E-MAILS:**

- cypherig emails: only sender and receiver can see them
- digitsl signature: code that gets added to the email to idenfyt the sender. It needs a digital certificate issued by a certifying authority that is legally recognized and crypting slgorithms (to avoid forgeries)
- do not open unknown attachements (malwares hidden in a macro)
- do not answer to spam (to avoid showing that your address exists and is active)

**PHISHIG:** fraudulent messages that pretend ti be from banks and other institutions in order to gain sensitive informations. Characteristics:

- use of the name of real companies and real people
- fake brands
- email addresses not coherent with the sender
- spelling and synthactical mistakes
- language not coherent with the style
- link to fake websites, graphically identhical to the original one
- esortation to divulge personal informations (through promise of prizes or of threats)

Phishing attempts can be denounced to the involved companies or to the authorities.

NEVER show on social networks: address, work phone number, reserved informations on your job, financial informations, pin, passwords

#### **RISKS RELATED TO SOCIAL NETWORKS:**

- cyber-bullying
- grooming
- divulgation of personal data
- fake identities or appropriation of someone else's identity
- fraudulent behaviours or phishing

**VOIP (voice over IP) AND INSTANT MESSAGING VULNERABILITIES:** due to the Internet=

- malwares
- backdoor
- third partiess access to files shared on these apps
- eavesdropping

#### **TO ENSURE THE CONFIDENTIALITY OF INFORMATIONS:**

- using applications that allow cyphring
- do not divulge informations

- limiting the sharing of files
- using an antivirus to check whether the file contains a virus before opening it
- blocking unknown or undesired senders

Mobile application may or may not be authorised to do certain operations → “terms and conditions” acceptance: information that apps could be authorised to know: contacts, positions history (GPS), photos or videos, browser history and bookmarks, data belonging to the user, the device or the operating system.

#### **RISKS RELATE TO THE DOWNLOAD OF UNOFFICIAL APPS:**

- malwares
- apps who use the resources of the device in an unnecessary/unauthorised way
- low quality/no warranty
- hidden expenses

#### **IN CASE YOUR DEVICE GETS LOST OR STOLEN: precautional measures:**

- remote deactivation (PIN)
- remote data cancellation
- geolocation of the device

#### **PHYSICAL SECURITY OF THE DEVICES:**

“census”: keeping track in order to immediately verify if anything's missing and to testify the initial possession

standard Kensington security lock (cables to avoid thefts)

checking the access to computer rooms

**TO RETRIEVE DATA:** making security copies (on a business level, this is part of the disaster recovering plans).

#### **BACKUP COPIES:**

- partition of the disk unit/local device
- external unit: USB, hard disk
- cloud

→ PROS: immediate access, support dimension's scalability, storage in protected places, delocation of the safety copy

→ CONS: in case of loss/theft you lose the copy too, it must be connected to the original one in order to be kept up to date, data control and management, privacy related risks, internet connection

Every backup software has reactivation procedures: starting from the backup copy, it allows you to transfer data to the original location

#### **WAYS TO DESTROY DATA IN A SAFE AND EFFICIENT WAY:**

- physical destruction of the documents
- physical destruction of mass memories
- demagnetizing= degaussing (not for CDs or DVDs, since they are optical supports)
- cancellation softwares; when the mass memory needs to be used again → overwriting data so they are unretrievable. These kind of programs can be free.

# MODULE 6: PRESENTATION

Opening view: to open a pre-existing project you need to go to Open – Browse – Docs. It is possible to also choose a new model from the list shown on the opening page

If it is necessary to see more than one presentation together need to go to View – Window – Change windows.

Change the settings: file – settings  
Generals – Username or Initials  
Save – OK

**View the presentation.** View:

- Normal view
- Structure view – titles
- Slides
- Notes
- Read view

**Change the type of slides**

Home – slides – layout

Project view

- THEMES: backgrounds and themes of slides (if selected, changes all the slides)
- VARIATIONS: change the colours (changes all the slides)
- BACKGROUND: keeps the theme chosen but changes the background (changes only the background of the selected slide. To edit all the slides need to do “Apply to all”)

**Copy e double slides between different presentations**

Need to follow the path: File – New file – View – show everything

The two presentations will be shown next to each other on the screen

It is possible to edit the general layout and to insert an object on all the slides without having to modify them one by one. That is done through the **SLIDE MASTER**

The slide master shows the general layouts of all the slides. No content is shown. By editing one of them and then closing the view all the slides will be edited in the same way.

It can be used e.g. to insert a logo, a shape, a trademark

The great advantage is that with the normal view, it is not possible to edit or delete the inserted object. That can only be done through the slide master functionality

To edit the typing style and the colours, but don't change the model: Home

## FOOTNOTE

- **View** – slide master (view the Master (that is, the first slide with the general template))
- **Insert** – footnotes – apply/apply to all

In power point the content is written within textboxes. That can be included following the path (Insert – textbox, within the text group of commands).

There in another way to add a text: view – outline layout view

**Tables:** they can be designed so to maintain the layout of the slides.

To edit them, need to access the layout tab.

**Graphs:** When choosing what type of graph to use a preview is shown automatically

- Edit the type of data – need to follow path: design – edit data
- Change the type of graph: design – change the type of graph

- Could use a combined graph if the scales for different data are different from each other
- Change the legend: right click – axes layout
- Labels: right click – labels layout – e.g percentage or similar
- Change the graph colour: design
- Change the colour of a single set of data: double click on the set itself
- Change the background colour: right click – graph layout

**Organograms:** “Insert SmartArt element” – hierarchies – organograms

Design – can raise or decrease the level of the members of the organogram. It is also possible to add new shapes

SHAPE: can be put either up, down, before, after, at the same level of someone else (in that case it will be an assistant)

Layout – fill: allows to change the colour of the selected shape (not of all the others as well)

**GRAPHICAL OBJECTS** – insert images

PowerPoint automatically downsizes the images at the dimensions of the textbox

Align the image: layout – position – align

Insert other objects: insert – shapes

Gather together in a single block more than one shape: select all of them – right click – collect

To separate them: right click – separate

## TRANSITIONS

between the slides

Several groups of transitions:

- Preview
- Transitions to the slide
- Interval

## ANIMATIONS

of single objects in the slide can be directed from animations panel

Advanced animations can be worked out from the animations window that opens on the right

Footnotes – can be viewed in the presenter view

Layout – slides dimensions: allows to set the layout of the slide

Hide a slide: right click on the slide and select “Hide” so that it is not viewed in the presentation

**Spell check:** right click on the wrong work/repeated word – the correction box opens up

Control the language (down – left)

Press on the button with the dictionary and the X next to the language in the lowest part of the document: the list of all mistakes will be shown

**Print** the presentation: file – print

## INTEGRATION

Save the presentation in a different format: file – browse – presentations can be saved in pdf

Options – can decide whether or not to include the frame of the slides, the hidden slides, the comments, notes and how many slides to print for page

**Hyperlink:** Select the word – insert – link

To delete an hyperlink need to put the mouse on the word and follow the path: insert – hyperlink – delete

OR right click – delete

It is possible to downsize a graphical object maintaining its proportions

That is done by clicking on the shape - drawing tools - layout - dimensions - small square - tick on "block proportions"

Align the objects:

- Drag and drop mode
- Select the objects - drawing tools - layout - align

Layout types

- Title only
- Empty
- Title and subtitle
- Title and content
- Section heading: it is used to create various sections or to divide the presentation in more parts, especially if they are particularly long
- Compare: title - two headings - two textboxes
- Content with description - two areas next to each other. To the left there is the title, to the right the content
- Picture with description

# MODULE 7: ONLINE COLLABORATION

ICT = Information and Communication Technologies

Services available:

- Exchanging files with other people through a remote connection
- Working simultaneously on the same files
- Communicating through Instant Messaging (IM) or Voice over Protocol (VoIP) apps

## Cloud computing

by accessing the Internet it is possible to store information in a virtual space where all files are stored safely

- Storage space on remote servers – either free of charge or not
- Option to access web-based applications that do not require the installation on the device

**Mobile technologies** allow to use tools such as:

- Productivity suites (word processors, spreadsheets, presentation)
- Social media
- Online calendars

Mobile technologies – allow to use online meetings (e.g. chat video) and online education programs.

The main aim is to have several users connected simultaneously, reaching a global diffusion.

Simultaneous accesses also allow more people to work on the same resource.

## Advantages:

- more users
- reduced travel costs
- availability of several tools that make communication easier
- possibility of teamwork
- possibility of working from anywhere.

## Risks:

- Possibility of access by unauthorized users
- Some users could damage others' collaborators job (e.g. delete data by another collaborator)
- Malware
- Ransomware
- Cyber crimes
- Interruption/instability of internet access

Property rights are guaranteed by copyrights and licenses

## CLOUD COMPUTING

Allows more authorized users to access shared files and documents. These are available at any moment and can be accessed anywhere, both from mobiles and non-mobiles devices, providing an Internet access is guaranteed.

Several applications enjoy the benefits of cloud computing, making communication easier between users: email, instant messaging, videoconferencing.

Cloud computing also allows you to work even if the software is not installed on the device (Office online).

## Advantages

- No costs required for the installation of an hardware
- Possibility to work from any device
- Possibility to decide how much space and which apps to use according to personal needs, therefore, users are no longer limited by the device's capacity
- Constant updates by the app's producers

## Risks

- Services are available only if an internet connection is available
- Unauthorised accesses could occur
- Malware could lead to loss of data and thefts

Cloud computing offers several services through the browser; it is important, however to keep the browser constantly updated to avoid malware.

**ADDITIONAL PLUG-Ins** = softwares that complete the browser's functions. Examples are Java and Flash. Plug-ins do require updates as well.

It might be the case that it is requested to install specific applications in order to use some services  
In some cases it is also demanded to install a specific hardware: e.g. webcam, microphone, speakers

**FIREWALL** = software that allows to limit access to the device for security reasons

It might include settings that limit the use of data for some applications

It is also possible to edit such settings

User account: to make use of collaboration instruments online it is necessary to have an account and some access credentials - to obtain an account might be necessary to subscribe or pay depending on whether the service is free or not.

## ONLINE STORAGE

Online collaboration services offer the users the possibility to save files on remote servers. The only limit is that it requests internet access

Such services are offered either for free (access through registration) or not and offer some limited services:

- Limited storage space (5 GB)
- Limited file dimensions
- Limited possibilities to share the file
- Time limits

If the user accepts to pay a fee, such limits can be overcome

### GOOGLE DRIVE:

Several services offered

Google docs (online version of Word), Sheets (online version of Excel) and Slides (online version of PowerPoint). Files can be shared with more people through the "Share" button. It is also possible to share the file through a link or via email.

Files are saved automatically online and can be shared also in read-only mode

**ONE DRIVE:** Drive online by Microsoft. Includes online versions of Word, Excel, etc

It is always possible to recover previous versions of the file

That can be done through "google drive" - file history OR CTRL ALT + Maiusc + H

### GOOGLE CALENDAR

It is possible to create an event: "Create" button on the left of the page or by double-clicking on the date chosen

3 default calendars are chosen: Google Account, Birthdays, Reminders

Clicking on the small arrow on the right of the calendar's name, it is possible to:

- Share the calendar: it is possible to edit the settings and the authorizations (edit, read-only, etc.)
- Settings (e.g. time zone)
- Trash folder
- See only one calendar or others

It is also possible to associate Google Drive's files to an event

If the event is repeated more than once it is possible to select the button "Repeat" on an event

Button "AGENDA"

Button "MORE" - can print the calendar

### SOCIAL MEDIA

- **Networks:** Facebook, Google+, LinkedIn
- **Wikis:** Wikipedia
- **Discussion groups:** forums often related to specific topics
- **Content sharing:** Flickr, Picasa
- **Blogs:** e.g. on travels, literature, politics
- **Microblogs:** Twitter

**ONLINE MEETINGS:** such as GoToMeeting

Plan a meeting: "schedule" button - can send a mail to guests

"Start the meeting" button

Possible to decide rights of access for each guest

It is possible to share the screen through the respective button

"Change presenter in" - transfer organization control to some other guest

"Share keyboard & mouse with" - allow other members to control the mouse and the keyboards on the screen shared

### ONLINE LEARNING

Two different types:

- VLE = Platform that makes content available, communication instruments (e.g. mail, chat, video meetings) and online collaboration instruments (e.g. forum, wiki)
- LMS = application web based that gives tools to run online classes (e.g. Moodle)

### Moodle

Calendar, wall, chat, judgement registration. It is necessary to login (in some cases it is possible to create classes for which no registration is necessary)

Upload a file on Moodle: file - upload on server - Browse - Select the file to upload

Download a file from Moodle: link - download

Availability of Quizzes and forums on online classes

**MOBILE DEVICE:** can be used making the most of all functionalities even when moving

Tablet, smartphone, phablet

Main characteristics:

- Integrated processor
- Communication devices (webcam, microphone, speakers)
- Touchscreen display to view and insert data (display is the output and input)
- Internet connection - can use mobile data (subscription, SIM card)
- Can download applications

Main operating systems: Android, iOS, Windows Phone

Android is an OPEN SOURCE licence

**BLUETOOTH** = technology that allows to exchange data in a safe way on short distances. It also allows to have different devices communicate between each other (e.g. headphones, speakers, keyboard, etc.)

Can also be used to transfer data

#### Internet connection


- WLAN  
No costs. However, it is necessary to stay in the span of the connection.
- Mobile data connection (3G/4G)  
Can be used also when moving. Very used and covers the entire territory. Not free.


Protect the device - PIN, fingerprint


Can share files between devices - mail, MMS, whatsapp, social media, Bluetooth, apps

SYNC: same data can be viewed in the same way and on different apps/devices

 [http://bit.ly/Peer2Peer\\_Bocconi](http://bit.ly/Peer2Peer_Bocconi)

 [http://bit.ly/Blab\\_Bocconi](http://bit.ly/Blab_Bocconi)

 <https://www.blabbocconi.it/dispense/>

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