

# **COMPUTER APPLICATIONS TECHNOLOGY MIND MAPS**

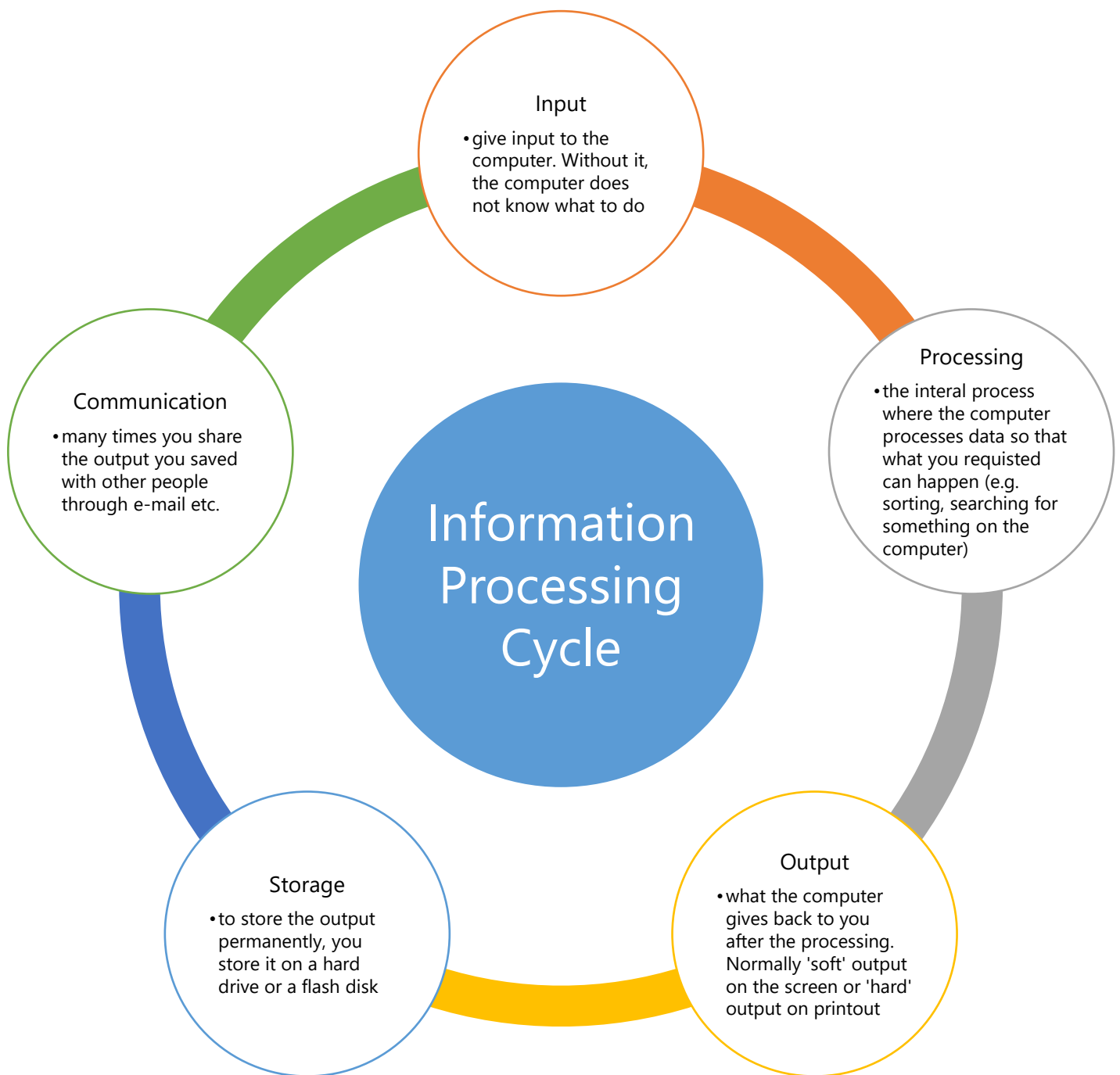
The information in these mind maps is supposed to supplement the textbooks, not replace it.

Although the author has made every effort to ensure that the information is correct, the CAPS document must still be consulted as the primary guideline.

Please report any omissions or errors to [claire.smuts@hsrandburg.co.za](mailto:claire.smuts@hsrandburg.co.za)

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### ICT: Information and Communication Technology

ICT refers to technologies that provide access to information through telecommunications (such as the Internet, wireless networks, mobile phones and other communication media)

# HARDWARE (Peripheral)

## Input devices

### Keyboard (wired & wireless/ bluetooth)

Physical keyboard

Touch screen's pop-up  
keyboard

Disabilities:

For blind people - braille  
keyboards, microphone

For visually impaired/motor  
skills - keyboard with big  
buttons

### Pointing device

Mouse (wired & wireless)

Touch pad  
Pointing stick  
Stylus

Touch screen / multi touch  
screen

For motor disabilities -  
trackball / footpedal /  
suction-blowing device

Wireless **advantages:**  
Cables are not in the way,  
can work far from computer  
**disadvantages:** theft risk,  
needs batteries, more  
expensive to buy,  
interference of signals,  
weaker response time

Can recognise more than  
one 'touch' and react - like  
pinch/zoom (also applicable  
to touch pad)

### Gaming devices

Joystick, Steering wheel,  
Controller (Xbox/Playstation)

### Scanners (resolution measured in dpi)

Barcodes (uses light rays/  
optics)

QR codes

Card readers (bank card) -  
OTM

Biometric - Face recognition,  
Fingerprint, Iris/Retina scanner

RFID - wireless (uses radio  
waves)

Office Flatbed & Feeder  
scanners

Character recognition

Used in POS system (point  
of sale) - know advantages  
and flow

Quick link to weblink - does  
not need to type in URL  
manually

For security - much better  
than password, cannot  
forget it

Linked to one person's  
**unique** biometric features

Disadvantage - you have to  
be there in person, can  
endanger you

OCR - scans to editable text

### Video & sound

Webcam,  
Digital video camera

Microphone (voice  
recognition, record music)

# HARDWARE

## Processing components

### Motherboard

Connects all components and parts of the computer with each other

Contains a couple of slots for additional cards like sound and graphics cards

### \*CPU - does the processing/thinking

Speed measured in = GHz

Quad core = 4 "cores"

Cache memory - files are kept in super quick memory so that access to the CPU is faster (than to RAM)

Well-known make e.g. Intel / AMD

### \*RAM (Primary Memory)

Function: loads current programs & documents when it is processed by the CPU

Feature: unstable/volatile: in other words: loses content without power (temporary)

E.g. DIMMS, DDR3/DDR4

Measured in GB

Cheapest way to upgrade computer & improve performance

### ROM (Read only memory)

Small chip built-in on the motherboard

Helps computer 'boot' - startup process (e.g. tests if all components needed is there)

Software on RAM that contains basic instructions:  
BIOS - Basic Input Output System

### Graphics card

Onboard = built-in on computer,  
Dedicated = separate card (better graphics)

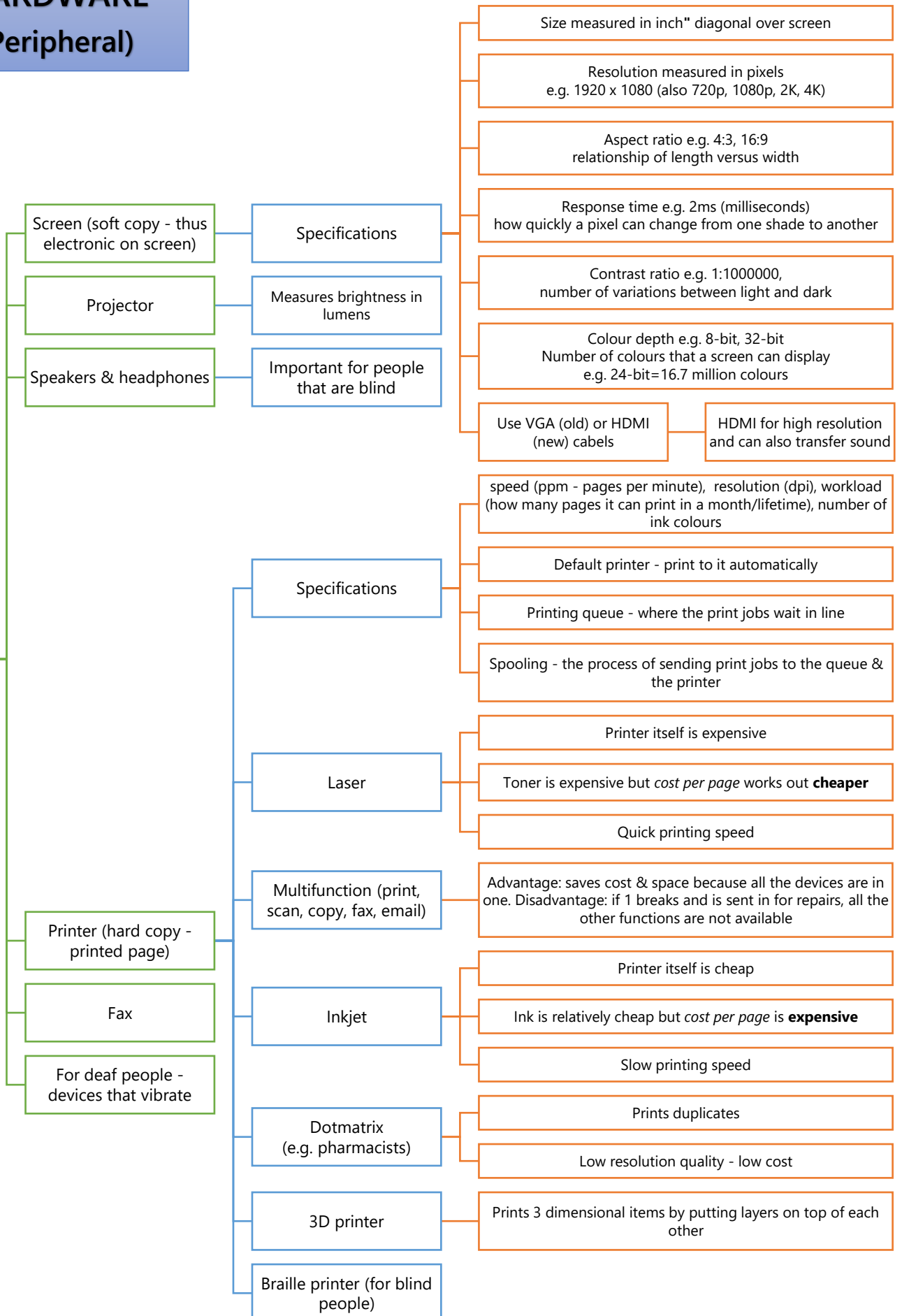
Has its own RAM and GPU (Graphics processing unit) thus better performance since the system CPU & RAM is not used by graphics

### PSU - Power supply unit

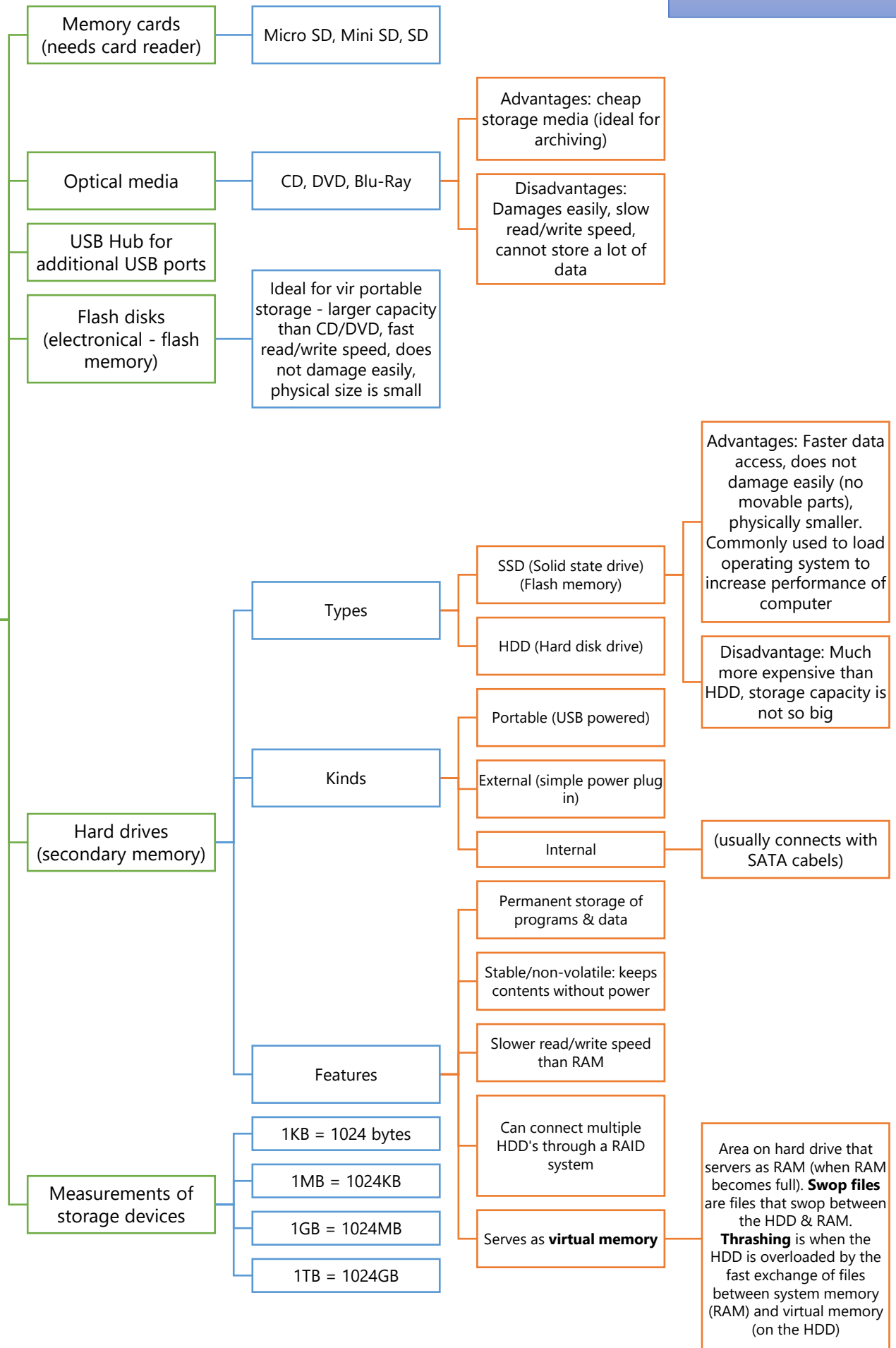
**\* Biggest influence on performance/speed of computer**

# HARDWARE (Peripheral)

## Output devices



## Stoortoesstelling



# HARDWARE

## Types of Multi-purpose Devices

Portable  
(BYOD policy)  
(bring your own device)

**Keep computers safe:**

- Lock room/office
- Use cable lock
- Activate alarm / movement sensor

**Protect desktop computers against power failures and power peaks with a UPS – uninterruptible power supply**

Not portable

Ultrabook

Usually contains SSD

Very high screen resolution

No optical (DVD) drive

Thin & light = expensive!

Laptop/Notebook

Tablet-PC

Laptop and tablet in one  
(screen can be taken off)

Netbook  
(cheapest type of laptop)

Small screen (<13")

Minimum specs (slow)

No optical drive

Tablet

Phablet

Screen size between tablet & smartphone

Smartphone

Has GPS, camera, gyroscope, accelerometer

Desktop PC

Entry level - basic computer with low specs  
High-end - top specs

Server (in network)

Work station (very strong computer)

Used by e.g. scientists / architects / video editors

Mainframe computer

Super size server - spans many rooms - MAIN computer in big organisation

## Dedicated devices

Only 1 purpose

GPS (can also be built into smartphone/car)

Measures physical location with geographical coordinates with satellites

GPS regularly updated

Can plan routes automatically

Can keep your eyes on the road more than you could with a printed map

ATM (handles financial tasks)

Digital cameras

Resolution measured in Megapixels (MP)

The higher, the better, but takes more space

Zoom

Optical - better quality - done with lenses

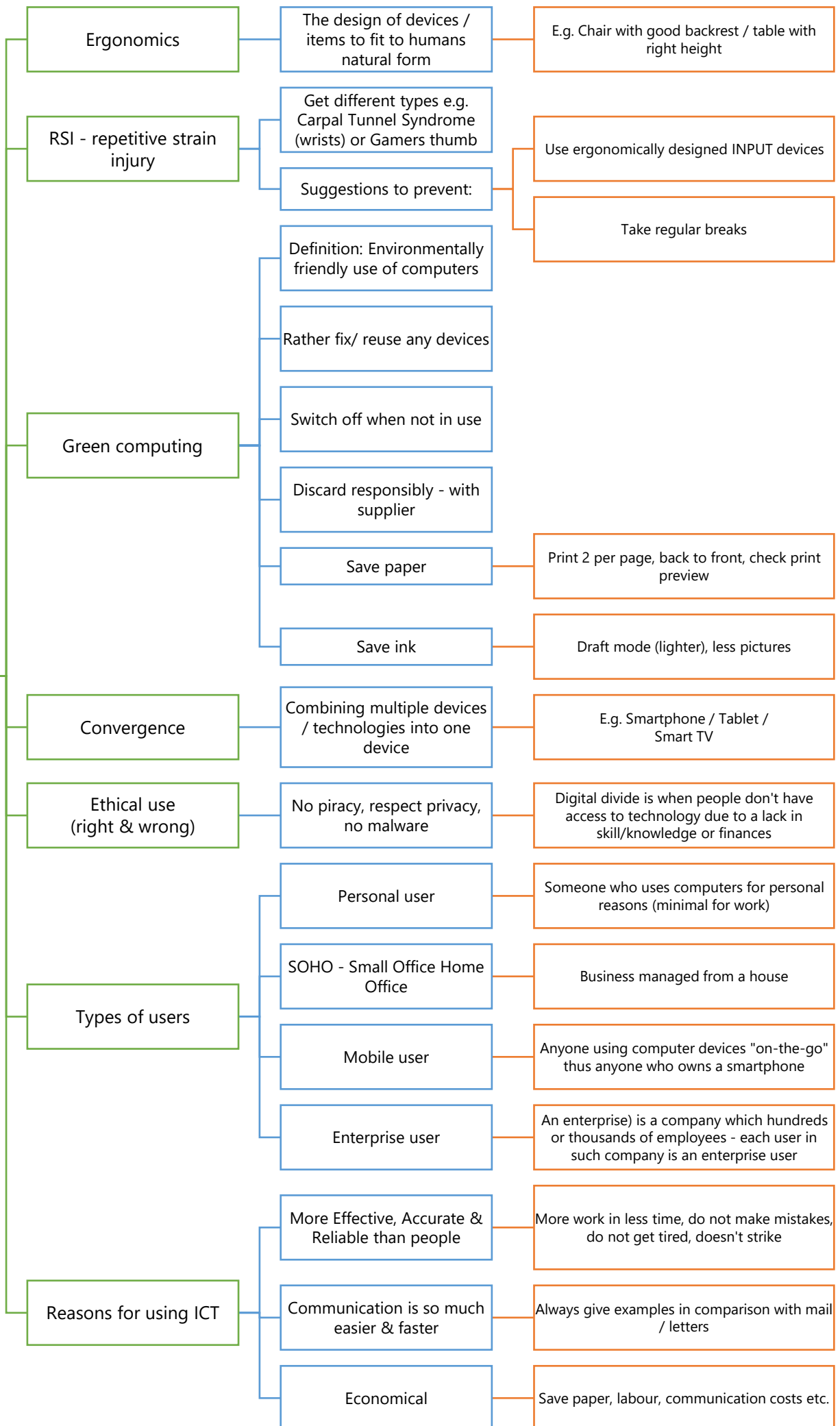
Digital - done with software

Geotagging

Places GPS coordinates in photo's metadata

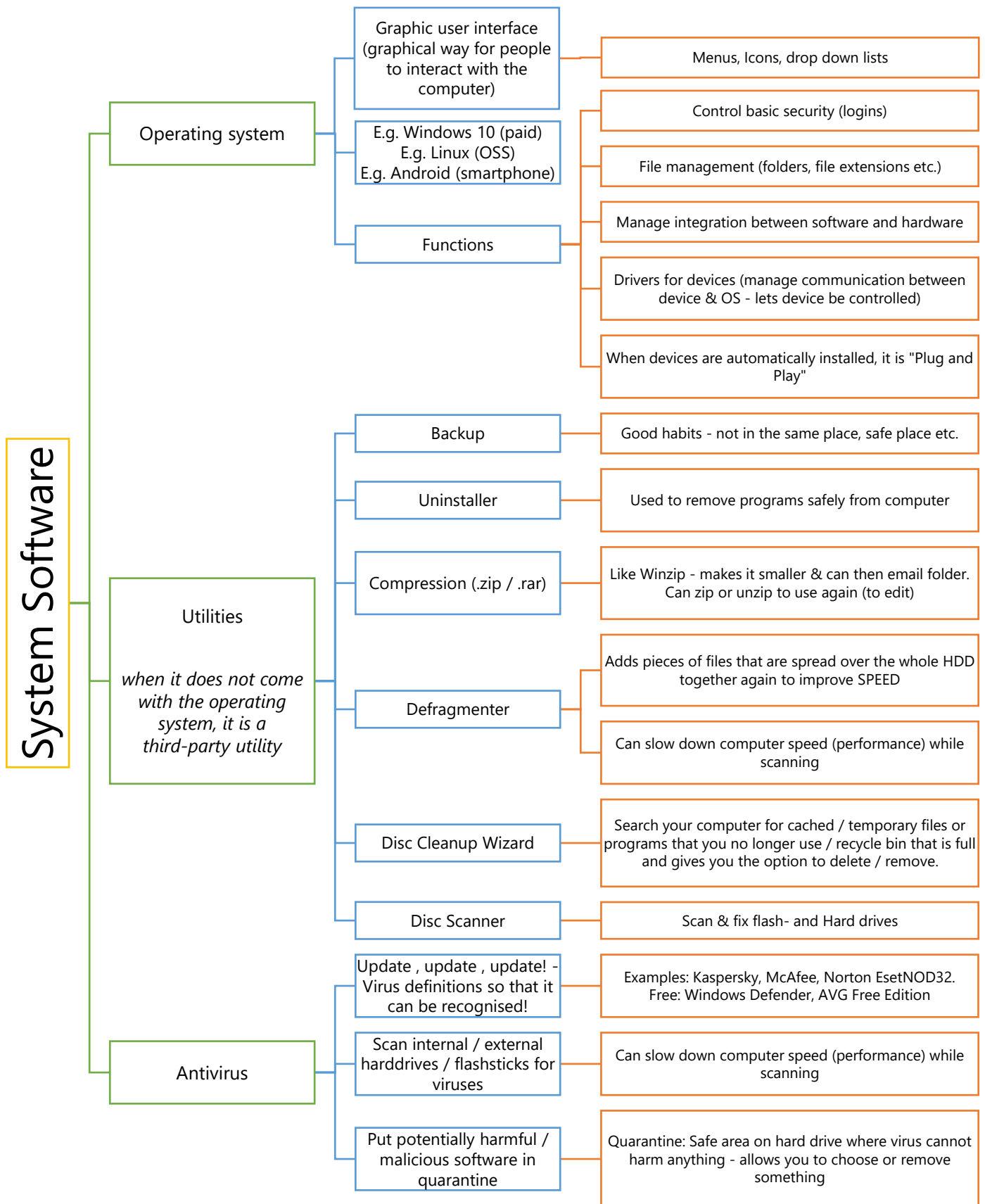
# HARDWARE

## Concepts



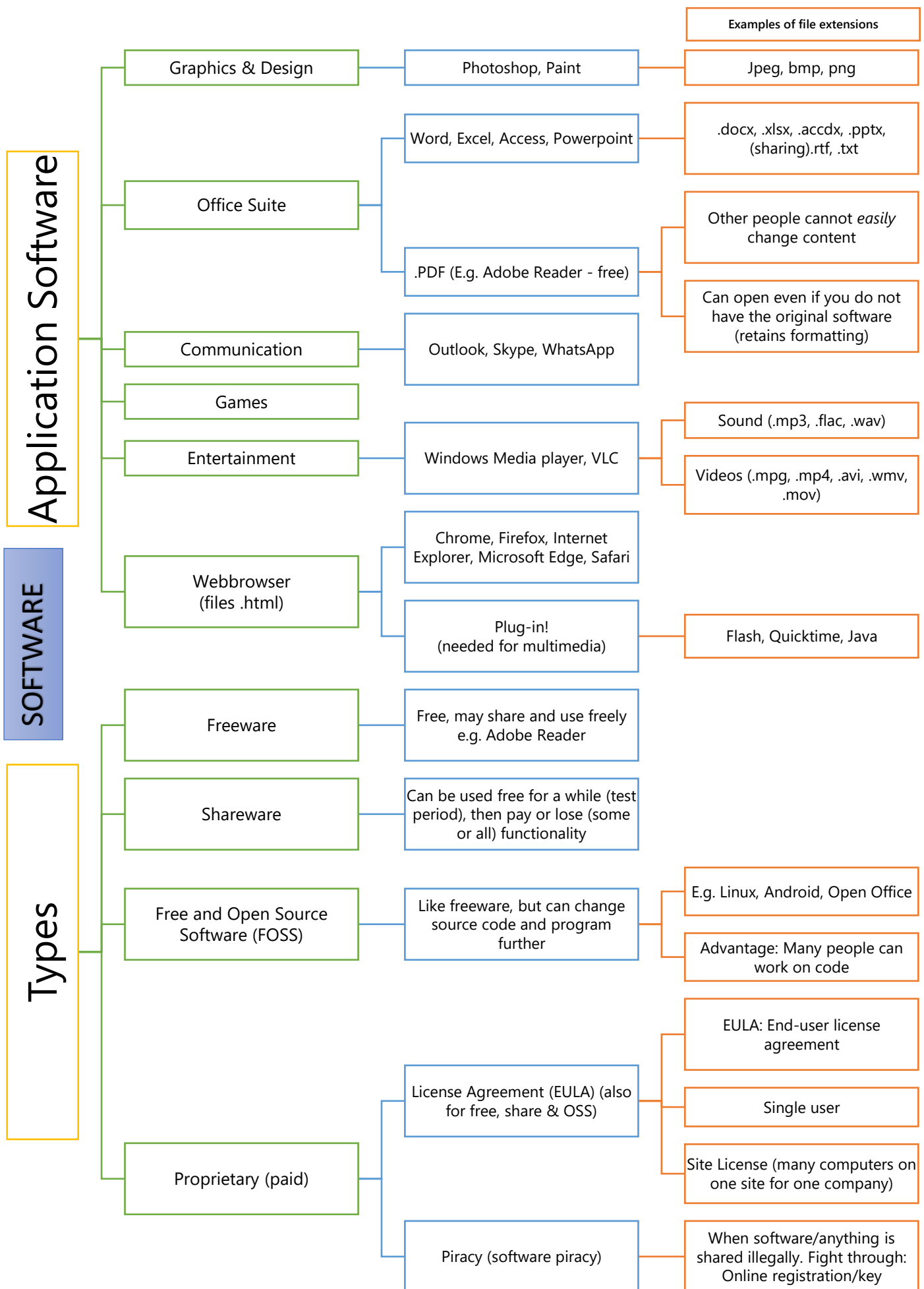


# SOFTWARE



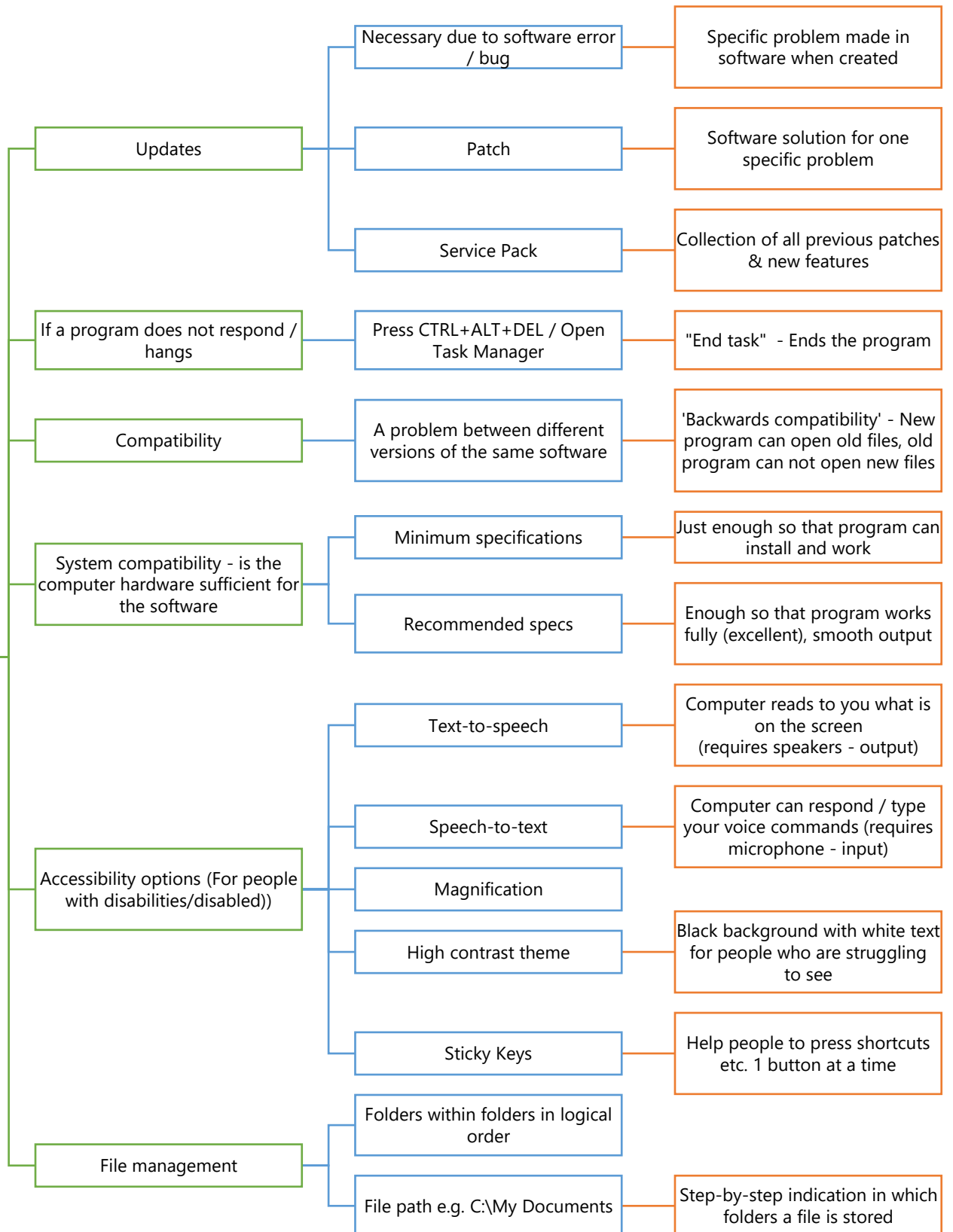
*System software manages resources on computer / allows computer to be used*

*Application software are programs for personal use / tasks*



# SOFTWARE

## Concepts



# NETWORKS

## Features

### Advantages

Can share resources like printers and Internet access

Data is kept in 1 central location / central storage

Easy communication between users

Share of software and / or updates

Can make backups from 1 central location

### Disadvantages

Viruses spread easily

Must have a lot of knowledge to draw up

Requires good security (so unauthorised users can not access confidential information)

Acceptable use policy

Definition: Contract / agreement between user and institution

Includes what may and may not be done on the network

A virtual private network (VPN) is a technology that creates a safe and encrypted connection over a less secure network, such as the Internet

The benefit of using a secure VPN is it ensures the appropriate level of security to the connected systems when the underlying network infrastructure alone cannot provide it

## Concepts

In school/work environment an AUP is signed

Virtual Private Network (VPN)

## Types

PAN - Personal area network - can fit on 1 table

HAN - Home area network - 2 or more rooms

LAN - Local area network - more computers in 1 room

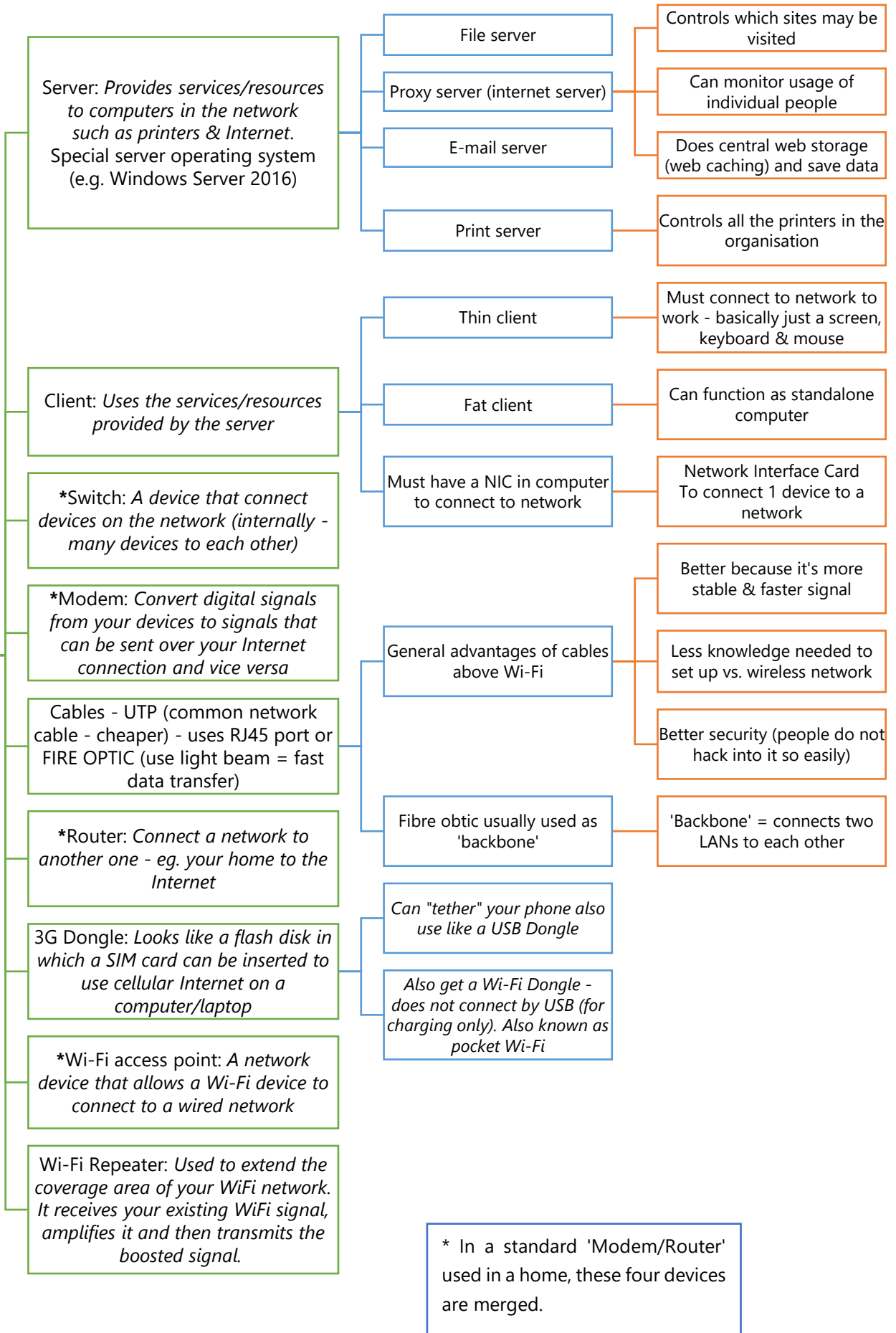
WAN - Wide area network - E.g. Gauteng

GAN - Global area network - e.g. Internet world wide

WLAN - Wireless LAN

# NETWORKS

## Hardware Needed



# INTERNET

**INTERNET** is a global network that is publicly available

**INTRANET** is shared content that is only accessible to members of a single organisation.

**EXTRANET** is a private network that uses Internet technology and the public telecommunication system to securely share part of a business's information or operations with suppliers, vendors, partners, customers, or other businesses. An extranet can be viewed as part of a company's intranet that is extended to users outside the company.

## Internet

Services:

Netiquette = Good manners on the Internet  
Do not type in capital letters (shout)  
Good spelling  
Do not send large email attachments

VoIP = Voice over Internet Protocol e.g. Skype

Instant messaging (WhatsApp, Google Chat, Skype chat)

Fax to email

Grid computing: Using multiple computers' processing power to solve 1 problem (as if it were 1)

FTP = File transfer protocol - share of large files over a long distance through the Internet

Cloud computing (web applications)

Cloud storage

Cheaper than regular calls (only uses data)

Can send video & audio

Can make calls wherever Internet access is available

Available on different devices like computers & smartphones

Video usage can use a lot of data (especially with a high resolution webcam)

Use of programs through a web browser - runs and is installed on Internet servers instead of on own computer

No installation/update required. Pay an annual/monthly license fee

Your own computer does not have to be so powerful because it works from the Internet server

A lot of people can easily work together on a document

Disadvantages: Internet access required, limited functionality versus installed software

Programs usually contain less features versus "desktop version"

Storing information/files on Internet servers

Can get information anywhere if you have Internet access

Can serve as a "Backup" for your data

Synchronises devices with the same content

The INTERNET is a global network of computers

The WWW is only one of the services on the Internet that displays web pages

# INTERNET

## Internet Services

### E-mail

To: to whom the e-mail is addressed

CC: other people who are being copied to take note - everyone can see each other's email addresses

BCC: people who are copied but cannot see each other's addresses (Netiquette - BCC people when emailing a group)

RE: an email reply automatically gets this prefix in front of the subject

FW: an email sent to someone else automatically gets this in front of the subject

Subject line: the subject of the email

Reply to all: when there is more than 1 person in the To or CC field you can "reply to all" and send a message to the same big audience (use with consideration!)

Attachment: attach a file to email (size limited to a certain number of MB)

Posreël ('mail rule'): automatic actions in an e-mail program according to rules you specify

### Social networks

Definition: Online service or technology that allows people with similar interests to communicate with each other regardless of time or distance

E.g. Facebook, Twitter, Instagram

Benefits: Allow groups to create virtual communities or pages for businesses/famous people, etc.  
Huge audiences to share your life with  
Can inform family members/friends about your life  
Businesses can place cheap and targeted ads and interact with their customers

Disadvantages: Thinking that friends on social media are real friends  
Danger of Cyber stalking/Cyberbullying  
Danger of online predator/pedophiles  
Someone who does not know you, may monitor your online habits to take advantage of it (to your detriment)  
May be addicted to social networks

Protect yourself/your business:  
Do not publish offensive content  
Do not accept friend requests if you do not know the person

### Podcast

Audio file downloaded from the Internet that can be played on computers or devices such as smartphones e.g. with radio programs/training etc. (Vodcast - when it includes video)

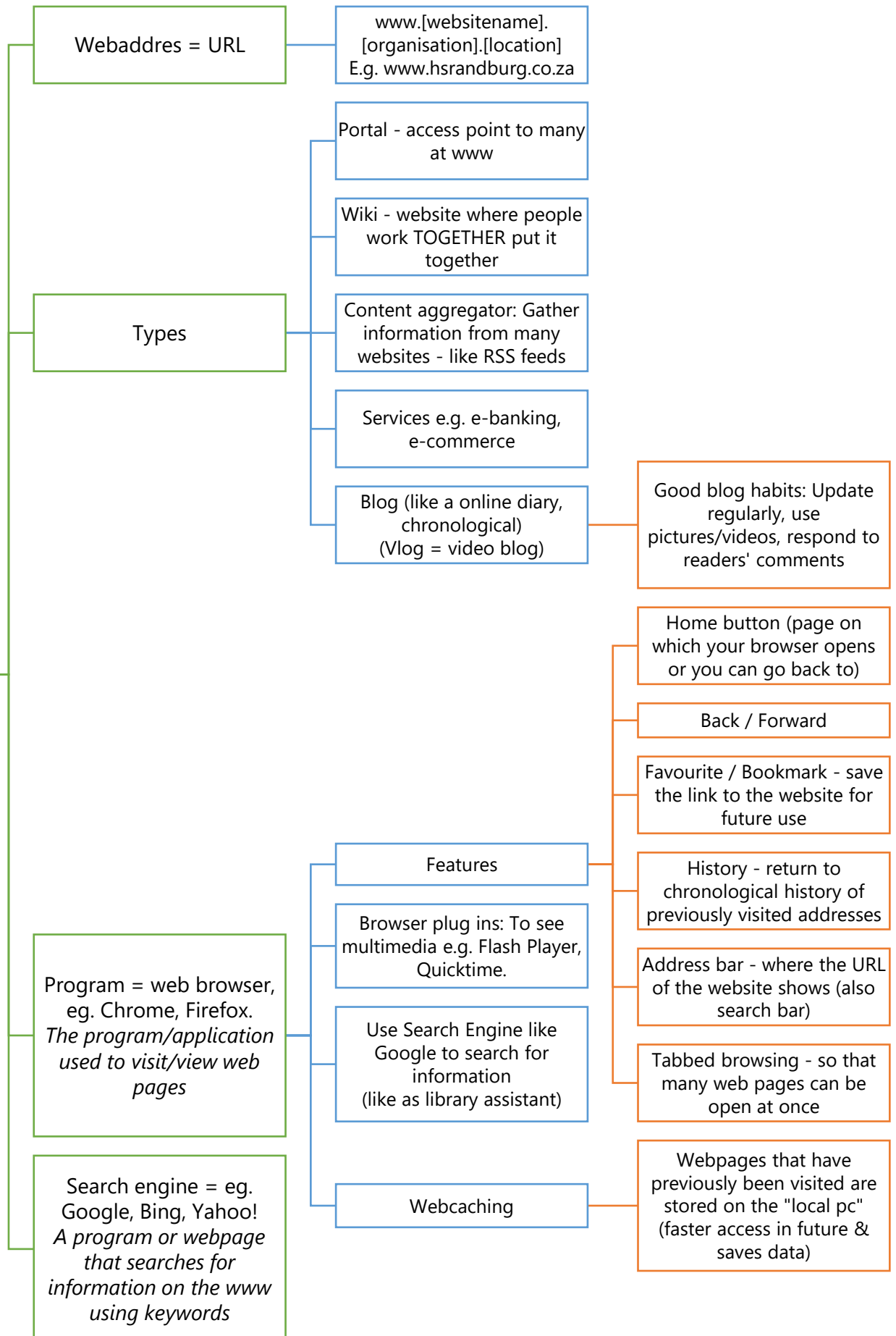
### Webcast

One-way flow of information broadcasted over the Internet to a large audience that may consist of audio, video and/or presentation slides  
Audience does not usually contribute to content

### Webinar

Interactive meeting or seminar. The content is usually education-based. The audience is usually smaller and takes part in the conversation through surveys, Q & A etc.

# World Wide Web





# INTERNET

## Technologies

Cellular (any connection using a SIM card)

Can it use it anywhere

3G (older)

4G / LTE (newer - faster)

Fixed connection at home

Cheaper than cellular **if** data usage is high

More stable connection than cellular (using copper telephone line)

Asymmetrical = Download speed high, upload speed slower

Highest data speed

Strongest signal (little interference)

Not easily damaged by lightning

ADSL

Fibre

**BROADBAND** =  
*High speed data transfer*

## Specifications

ISP - internet service provider = connect you to Internet (e.g. Mweb / Vodacom)

Every ISP has an AUP (Acceptable Usage Policy)

How much data you may use (though you are uncapped) without them throttling you

Bandwidth

The amount of data that can be sent/received in a certain time. Upload (data sent) vs download (data is received) speeds usually differ

Capped / uncapped data

Amount of data that you can upload and download in a specific period

Shaped / unshaped

Full speed all day: (low data usage services)

E-mail, regular browsing

Low speed by day (services that have high data usage), usually full speed night hours:

"Streaming" video (video that will never be stored on your computer)

Gaming / Torrents / VoIP

Throttling

Use so much data that they drastically lower your overall speed (penalty)

Can use any of the technologies listed above

Type of connections

Cabled

Wifi (802.11) - Wireless technology

Affected by walls / blockages

Bluetooth - short distances - pair devices

WiFi hotspot - area with WiFi coverage

NFC - near field communication like file transfer between mobile phones / payments with NFC bank cards - just tap

WiMAX - tower that broadcast Wi-Fi to a large area (few kms)

# NETWORKS / INTERNET

## Safe usage

Features of secure websites

URL starts with https

Address bar turns green

Lock icon shows

Antivirus & operating system updates

Do not click on pop-ups

Do not open unknown attachments / programs

Good passwords

Capital and lowercase letters, numbers, symbols, no patterns (*passphrase* - longer phrase is much safer)

Firewall

Hardware/system software that monitors access/ control from the network/devices to and from another network (like the Internet)

Piracy

Hacker

Identify security gaps in an ICT system

Cracker

Identify security gaps and *use it for criminal purposes*

Botnets

Many connected "bots" that include worms, trojans, spam, etc. Spread with other people's computers over the Internet without them being aware of their computers being used for that purpose

Identity Theft

Commonly used for a DDoS attack where masses of useless data or requests are sent to a network or computer. This can reduce the speed drastically or crash the entire network.

## Malware

(any malicious software)

Spread through emails, internet, flash discs, pirated software etc.

Prevent through antivirus software

Types

Worms (spread easily without action - like field fire)

Trojan (looks good but is bad - must be activated)

Spam - electronic junk mail

Hoax / fraud scheme

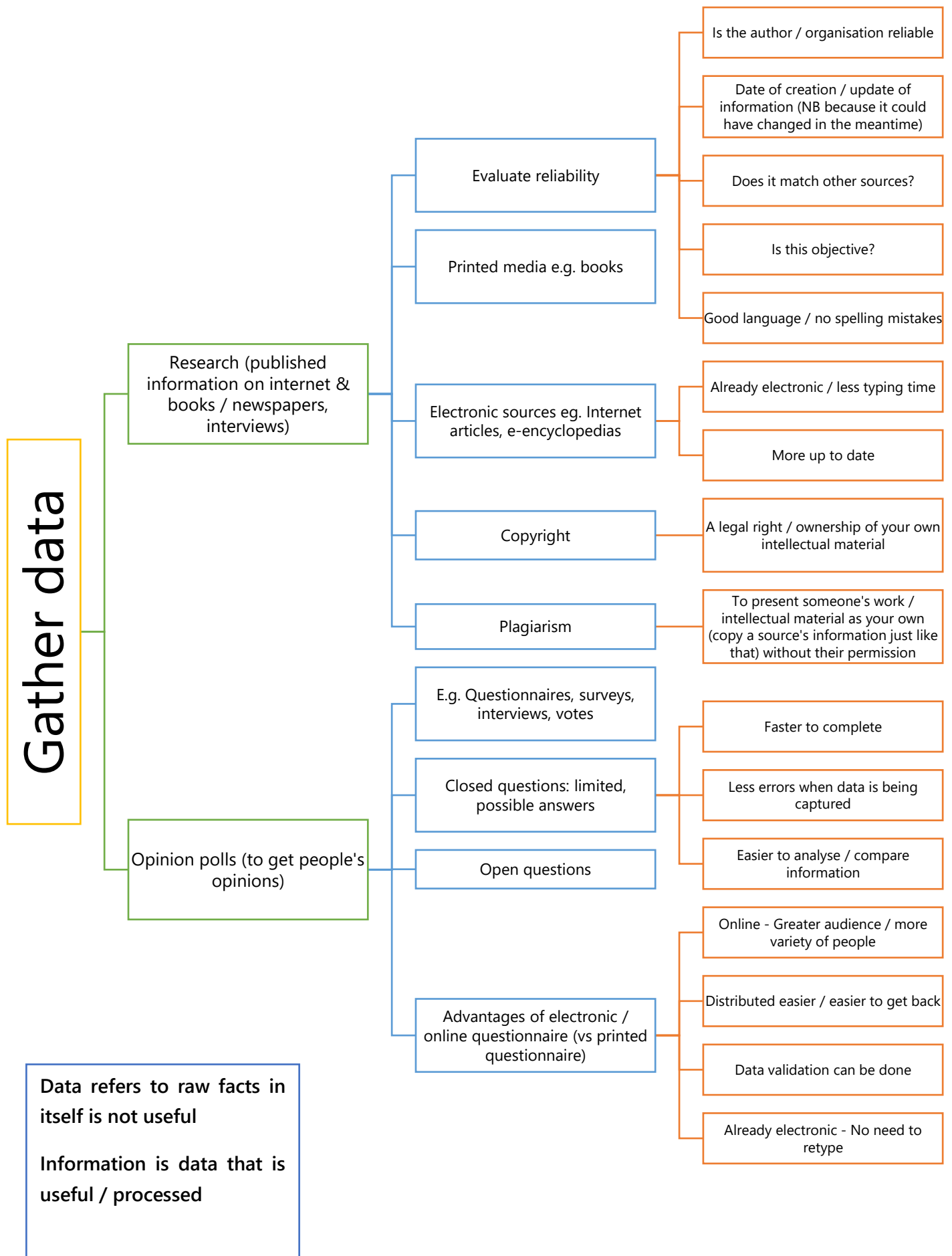
Phishing

Pharming - user is redirected to fake website, if he enter the correct URL

Spoofing - faking email header

Sniffer attack - Small program that can read data packets over a network

# INFORMATION MANAGEMENT



## Research / Data presentation / analysis

