

ICT Module 2 Terminology

Why learn terminology?

Both to understand the course and to be able to answer an exam question properly, you will need to understand all of the terminology associated with this unit.

Knowing terminology empowers you to be able to understand the subject and to show to the examiner that you understand the questions set.

This booklet outlines the terminology that you must know from Module 2.

Term	Definition (important words in italics)
(Relational) Database	A collection of tables of information which can be <i>linked</i> by the use of <i>primary and foreign keys</i> (see later for advantages), managed using a RDMS – Relational Database Management System
Acoustic coupler	A device, <i>attached to a normal phone line</i> , which allows a remote computer to connect to a network or mainframe.
Application Generator	With input from the user, who specifies the interface required and what functions are required, it automatically generates the code to produce the <i>customised application</i> . (No programming knowledge needed)
Application Package	Any <i>self-contained piece of software that is developed for a specific purpose</i> (one of which could be to act as a general purpose package) e.g. Sage is an accounts package, one purpose; Word is a general purpose word processing package. (as normally pre-written, other systems may have to change to interface)
Backbone	The cabling/connections used in a building that connect all of the computing power into a network

Batch Processing	Where <i>like transactions</i> are gathered together over a period of time, (in batches), and processed together at a set time (e.g. end of the day), without the need for human intervention. Verification is often mentioned with respect to key-to-disk systems. Validation is often mentioned as part of the batch input, producing <i>error reports</i> for rejected transactions. E.g. of use in a banking system, where transactions that have taken place during the day are collected and fed through in one go to update the Master file overnight, so that reports can be made re the day's business
Bespoke Software	Software written for a specific purpose for a particular company to do a particular job. E.g. to collect quality inspection results for a breakfast cereal manufacturer (probably written to fit in with other systems within the company).
Bridge	A hardware combination device that allows information to be passed between two <i>similar</i> networks, normally LANs. A buffer in the bridge allows communication between LANs of different speeds.
Command driven system	A system where <i>command words drive the operations</i> . E.g. MS-DOS where the command Copy a, b will copy the contents of file a into file b
Common User Interface	A selection of packages, normally produced by the same manufacturer, which look, feel and act in similar ways. E.g. WIMP features will be in same place and look the same (same icon for spell checker etc)
Communications device	Any piece of hardware that allows computers and other devices to <i>communicate</i> e.g. Modem, cable, satellite, bridge, gateway etc
Data format/data type	<i>How the data is held/looked at</i> e.g. Text (alphanumeric), numeric (binary, currency, data, integer, real), sound, code/program, Boolean, picture/image/graphical/video
De facto/De Jure standards	De facto standards are those which have come about by <i>commercial success</i> – e.g. no-one has said that everyone must use MS Windows and MS Office, but the vast majority do De Jure are those which mean that no single company has an <i>exclusive right to use them</i> – i.e. the way in which computers connect – RS232 ports, parallel ports, TCP/IP and so on.
Flat file	Is the accepted term for a collection of related data that has <i>no automated links</i> to any other data. Any combining of data has to be manually programmed. Still in use for transaction file data, but most master data is now held on a database or a set of databases known as a data warehouse.

Gateway	A hardware/software combination that allows information to be passed between networks of <i>dissimilar types</i> – e.g. a LAN to a WAN. I.e. they will translate the different protocols and enable communication
Generic Software Package	<i>An applications package that is appropriate to many areas of day-to-day business operations</i> e.g. a spreadsheet can be used in the accounts department for working out profit/loss, in the payroll departments for working out tax returns, in the MIS department for producing graphs for management reports. Usual examples given are word-processors, spreadsheets and databases management systems. Desk top publishers are normally an alternative to WP (not as well as). Integrated packages are OK, but will only get one mark where 3 might be available.
Graphic User Interface	Has <i>Windows, Icons, Menus and a pointing device</i> – simple for non-expert, intuitive (picture of a printer means click button, will print?), easy to learn, transferable skills. Most used – MS Windows
Hub/concentrator	A hardware device that handle the cabling requirements of linking LANs together and linking them to WANs.
Human computer interface	The way in which a computer user communicates with the operating system of the computer they are using. Types include – Command-driven, menu-driven, graphical user interface.
Input device	Any hardware device that allows data to be input to the system e.g. Mouse, Keyboard, scanner etc.
Integrated Package	Generic software from a manufacturer that normally contains <i>cut-down versions</i> of their main generic software. Advantages, less complex (to learn), data can easily be transferred across constituent parts, generally cheaper than buying full-blown, interface looks the same. E.g. MS Works. Disadvantages – not as powerful as full-blown packages, less functionality, may be harder to export to customers if not using the same software.
Interactive processing	Is a <i>dialogue between the user and the system</i> . The system responds to each input <i>straightaway</i> . (Not processes straightaway!)

Intranet	<i>Shareable information that uses internet/web technology, where access is restricted to within a company</i>
Local Area Network	A collection of computers (normally PCs) and other devices <i>connected together locally</i> – normally in <i>one building or on one site</i> , usually within a one mile radius, and normally <i>using physical data transmission media</i> (e.g. coaxial or optic fibre cable) although infra-red/wireless connections are also possible. There are different types (Server-based, Peer-to-Peer) and topologies (Star, Ring, Bus)
Macro	“is a small program”. It is <i>programmed or recorded series of actions/commands that can be activated by either a single key-stroke, or at the click of a button</i> , and can be performed as many times as required. Often used in spreadsheets to perform repetitive calculations or for printing out a report in a particular format e.g. a receipt
Menu driven system	A system where a <i>hierarchy of menus</i> is used – each level narrowing the options until the correct process is chosen. They could be pull-down menus, pop-up menus, choices (e.g. a list of items, numbered, with an input field to enter the number) or programmed buttons to choose from
Mode of processing	This is how processing is undertaken for a computer system. The two main modes are <i>Batch processing</i> and <i>Transaction processing</i> . Transaction processing is further broken down to <i>Real-time, Pseudo-real-time and Interactive</i>
Modem	Modulator-DEModulator – this is a device <i>that converts analogue signals into digital signals and vice-versa</i> . Analogue signals travel over telephone wires/cables (sound waves) and digital signals are what the computer understands (i.e. 0s and 1s)
Natural Language Interface	This is an interface where the user can simply type in a normal sentence ,e.g. a question such as “How do I find out about my family tree?”, and the interface will be able to assimilate the keywords and apply some logic to provide the desired response; total opposite of command-driven interface where special words are used.
Network Topology	The <i>shape of the network</i> – can be Bus, Ring and Star

Office Suite	A collection of <i>fully-functional generic application packages sold together with some extra bits and pieces, produced by the same manufacturer, that fully interact with each other.</i> Examples are MS Office 2000 (or XP) and Lotus Smartsuite. An example of an extra for MS-Office is MS-Query.
OLE (Object linking and embedding)	This is <i>the mechanism that enables, say a table of figures or a graph produced in a spreadsheet to be included in a word-processed document. Embedding is similar to copy and paste. Linking the object means that if the original changes, so does the "copy" in the WP document. (this is achieved by copy and paste link)</i>
Operating system	A piece of systems software that <i>controls all events in a computer system (see Useful lists, below)</i>
Output device	Any piece of hardware that <i>is used by the computer system to produce an output, either on paper/other hard copy (e.g. microfiche), an output media (eg. a CD by a CD-rewriter) or sound</i>
Peer-to-peer Network	A network set-up where all stations essentially are equal in stature. Software, Files and Data can be seen by all, access levels permitting. Data Transfer and communications easier. Peripheral sharing improved etc. If one node goes down, network normally fails, although depends on linking, as may just mean that info. on that node cannot be seen, but rest of network still works.
Printer Driver	<i>Interface between operating system and printer. Translates formatting info for printer; Stores set-up/configuration info; translates fonts, bit maps and size control for printer; controls printer error messaging.</i>
Processing device	This is the <i>"chip" or the computer system's "engine" that performs all arithmetic and logic operations.</i> In a PC, this is normally taken to include the CPU, the motherboard, the video and disk drive controller boards, input and output ports, plus possibly a maths co-processor (used typically for CAD/graphics systems)
Program	<i>A set of instructions that, when executed, perform a particular task.</i> Different programming languages suit different applications. Whatever the "programmer" produces is normally translated or compiled into machine-readable format.

Pseudo-real-time processing	A processing stem where things <i>appear</i> to happen instantly – a good example of this is a booking system where each transaction takes its turn in updating the master file (or true transaction processing). TSB bank are still the only bank to use this type of processing – i.e. your master account is updated as you take the money from their ATM (all others work with copies of the master files as a start point and record transactions during the day – the batch processing at night updates the actual master files)
Real-time processing	Where output (from sensor) affects input – life and death situations (heart monitors?) fly-by-wire aeroplane systems, nuclear reactor. Most business systems are not this critical!.
Repeater	A <i>hardware device used on a network to “boost” the data signal every so often, to stop the signal fading out.</i>
Report Generator	A <i>piece of software that allows the user to specify what data and what format they require for a report, with how the data should be grouped. The RG will generate the code to produce the customised report.</i>
Router	A <i>combination of hardware and software that makes sure that a packet of data is sent along the backbone in the fastest way</i>
Search engine	<i>Used on the Internet to look for web sites/pages that match the user’s criteria. Works using keywords.</i>
Server-based Network	A <i>central server (on a Star shaped network) that has central control over security, backup, monitoring of network activity. Each node (PC or peripheral device) has direct access to the server, so can be faster than peer-to-peer. Also can have different (non-compatible) device types as these direct links.</i>
Storage device	<i>Any hardware device that can hold data.</i>
Transaction Processing	Each item of data is dealt <i>with as it is submitted</i> . Each transaction is completed <i>before</i> the next is begun. E.g. Index Mail Order Catalogue, if you phone up, as you quote each item they check it is in stock and give the go-ahead, then they ask for next item number. GUS on the other hand, check a screenful at a time (so their “transaction” is bigger?)
Transmission Medium	<i>Any material across which data can be transmitted. Can be metal (twisted pair wires, coaxial cable) non-metal physical (fibre optic cable) or nothing/waves (radio-waves, infra-red waves, microwaves). Each has limitations.</i>

Validation	Where a program/software check is made to see if data entered in a field is allowable/follows the rules. Many types (see lists, below)
Verification	Two types – one is to sight check data is accurate/correct on screen or paper; other is automatic data preparation/key-to-disk system check, where data is keyed from the source document and stored, then keyed on “verify” a second time again from the source document, and compared with the stored data – this purely checks that the details on the source document have been accurately transferred to computer.
Wide Area Network	Connected hardware is spread over a wide geographical area (anything over 2km to world wide) and makes use of third party telecommunications equipment (e.g. telephone lines, satellite communications). Examples include the Internet, but also any large national or multi-national corporation e.g. big banks, car manufacturers, government operations.

❑ **Types of Validation Checks**

- ❑ Range check - input between/over/under
- ❑ Type check - input numeric only/alpha only
- ❑ Length check - input exactly/no more than nn characters
- ❑ Format check - input follows certain pattern eg dd/mm/yy for a date or LLOObOLL for postcode
- ❑ Presence check - input must be present
- ❑ List/look-up check - input must be one of a list
- ❑ Cross-field check - input must be x if other field is y
- ❑ Look-up/existence check - input must match something on a file in the system

❑ **Advantages of Relational databases over flat file systems**

- ❑ Independence of data
- ❑ Less redundant or duplicated data
- ❑ Better consistency of data
- ❑ Improved quality of management information
- ❑ Single input principle/less time wasted on updating same data many times
- ❑ Ad-hoc reports easier to produce as have linked information/increased productivity
- ❑ Different access rights to different parts of the database giving increased control over data security

❑ **Data Capture methods/devices**

- ❑ Speech recognition
- ❑ Magnetic Ink character recognition
- ❑ Bar code reading
- ❑ Key-to-disk
- ❑ Magnetic strip reading/readers
- ❑ Using sensors to capture data
- ❑ Optical character recognition
- ❑ Optical Mark recognition
- ❑ Keyboard
- ❑ Mouse
- ❑ Touch-tone telephones

❑ **Output devices**

- ❑ Dot Matrix Printers
- ❑ Laser printers
- ❑ Monitors (VDUs)
- ❑ Ink-jet printers
- ❑ Graph plotters (Pen or Flat-bed)

❑ **Storage devices**

- ❑ Floppy Disks
- ❑ Zip Drives
- ❑ RAID (Redundant array of inexpensive disks)
- ❑ DAT (Digital audio tape) drives (2-40GB)
- ❑ CD-ROM drives (700MB)
- ❑ Ditto Drives (2GB capacity, tape in removable cartridge, data transfer 10MB/minute)
- ❑ Optical Drives (used for long-term data storage, e.g. in Banking systems, where data must be held for 7 years minimum)
- ❑ Hard Drives
- ❑ Jaz Drives (similar to ZIP, larger 2GB capacity)
- ❑ DVD (digital versatile disk) Drives
- ❑ DLT (Digital linear tape) drives (70GB)
- ❑ CD-R and CD-RW drives

❑ **Functions of an Operating system**

- ❑ Manages all other programs in a computer
- ❑ Manages user communication with the computer
- ❑ Handles input/output from attached hardware devices/peripheral control
- ❑ Resource allocation and scheduling
- ❑ Memory Management
- ❑ Backing storage management
- ❑ Management of multi-tasking
- ❑ Interrupt handling
- ❑ Boot/re-boot/boot-strap loading/loading user interface

❑ **Editing facilities of word-processing packages**

- ❑ Cut/copy/paste
- ❑ Find and replace
- ❑ Delete letter/line/word/paragraph
- ❑ Drag and drop
- ❑ Insert/delete file/insert graphic
- ❑ Spell check/grammar check

❑ **Steps in Batch processing**

- ❑ Large volumes of like data
- ❑ is collected together
- ❑ over a set period of time/into batches of a fixed amount e.g. 50
- ❑ to be processed in one computer run'
- ❑ at a specified time
- ❑ without any human intervention

❑ **Security measures**

- ❑ Security procedures e.g. not leaving terminals logged on/password security
- ❑ Staffing issues – vetting/training/dismissal
- ❑ Backup procedures
- ❑ Virus checking
- ❑ Use of passwords
- ❑ Firewalls
- ❑ Use of encryption
- ❑ Permitted access levels
- ❑ Use of software for monitoring terminal activity

❑ **Backup Procedures**

- ❑ Selection of Hardware/Storage medium e.g. Dat tape/RAID etc
- ❑ Selection of Software
- ❑ Recording of transactions/What will be copied
- ❑ Frequency
- ❑ Number of copies held/generations
- ❑ Recovery procedures
- ❑ Location/security of backup copies e.g. offsite, fireproof safe etc.
- ❑ Job responsibilities for backup/recovery
- ❑ Prevention of access to backup – e.g. encryption, password protection etc
- ❑ Organisation of backups e.g. labelling
- ❑ Timing of backup operation e.g. at night

❑ **Implications of package change/upgrade**

- ❑ Upwards compatibility (no downwards)
- ❑ Training needs of users/lost productive time
- ❑ Increased use (and cost of) help desks possible
- ❑ Possible hardware incompatibility
- ❑ Possible systems/other software incompatibility
- ❑ Installation problems
- ❑ Learning curve for users (how long before up to speed)

❑ **Error types and handling**

- ❑ Transcription errors – transferring data from one place to another e.g. from a source document or from a telephone conversation putting into a keyboard – usually mixing like letters/numbers from bad handwriting e.g. o and O or S and 5; or person's speech not being clear. Or the inputter mishearing / misinterpreting or simple typing mistakes. For many transcription errors, using a form of verification is the only way to trap the error (see below).
- ❑ Transposition errors – where numbers, especially, get muddled up by mistake. The most common way of trapping these mistakes is by using a check digit (used extensively in banking for bank account numbers, credit card numbers etc and also ISBN numbers on books). Read in a book if you need to remind yourself how check digits work.

❑ **Problems testing complex software causing problems installing/running**

- ❑ May not have tested on same platform as being installed upon
- ❑ May still have bugs
- ❑ May be Alpha or Beta version (a pre-release version)
- ❑ May be incompatible with systems software or other software on computer
- ❑ Hardware may not be big/fast enough to run
- ❑ May not have tested for amount of data being used (lack of volume testing)
- ❑ May not have tested all paths properly
- ❑ May have rushed it to market (to beat competitor's product?)

Terminology Comparison Table

<p>Verification and Validation Verification is a second check to make sure that the data has been transcribed properly from source document (can be sight check or a machine-based check on a key-to-disk system), whereas Validation is when a software program checks that the data being input is in a valid format/holds valid data for that field</p>	<p>Accuracy and Validity of Data/Information Validity of data is stating that data in a field is acceptable to the program, whereas accuracy is saying that the data is in fact true or correct. E.g. WA15 6QF is an acceptable post code, but it is not correct for an address in London</p>
<p>LANs and WANs A LAN is normally located on one site and connected physically using cable or line-of-sight infra-red wireless signal, whereas a WAN can be world-wide, but certainly over 2km, connected using a telecommunication line e.g. telephone or satellite</p>	<p>Peer-to-peer and server-based networks Peer-to-peer, generally set out as a ring, have equal status on the network, are the same type of computer, and pass the data packet from machine to machine. If one fails, the network may stop working. Server-based, generally star type, keep shared applications and data on the network server, each station has direct communication with the server (therefore faster), central control of security, backup and monitoring. Different types of station are possible (i.e. PC and MAC), if one fails, does not affect the network (only server failing does that).</p>
<p>Security and Privacy Security is making people aware of their responsibilities to the company for whom they work, being wary of how they deal with company data/information (use of passwords/login procedures etc, signing a non-disclosure agreement, code of conduct/practice), generally taking care of company property in day to day activities, whereas Privacy is to do with personal data, covered under the data protection act.</p>	<p>Security and Safety Security of data is using measure to prevent anyone unauthorised from seeing the data e.g. hackers. Methods of security include encryption. Safety of data includes those measures to prevent malicious or accidental damage to data. Methods include staff vetting, backing up etc</p>
<p>Batch and Transaction processing Batch processing is used in large volume systems e.g. utility billing, where it is not urgent to process the data; Transaction processing is where it is important for the smooth running of a business for transactions to be processed as they occur. E.g. seat booking systems.</p>	

**Module Specific Terminology
(Created by AS ICT Students – 2002)**

11.1 - Data Capture (Steven Catton)

Input device	These are the components that take the data in like the keyboard, mouse, scanner, and web cam etc... anything that puts information in to the computer.
Processor	The processor is the computer itself and it controls the transmission of data from input devices to memory and from memory to output devices.
RAM and ROM	There are two types of main memory RAM/ROM RAM random access memory this is the type of memory that stores all the information to run the program that you are running at the moment but this memory is volatile as well so when the computer is turned off it loses all that information until it is opened again. ROM read only memory this type of memory is etched in to the computer and is not volatile like the other and it is what holds the bootstrap loader the program that runs as soon as the computer is switched on and instructs it to load the operating system which is what runs all the software and brings you to the main interface.
Auxiliary storage	This is another way of storing information but not on the computer so items like floppy disc and CD writers.
Output devices	These are items that give you the information instead of items that you enter the information so items that give you the information would be things like the printer and the monitor. <input type="checkbox"/> Printer - this is a hardware item that gives out information to you which is what make it an output device and it can give a print out of any information displayed on the screen. <input type="checkbox"/> Monitor_- This is the screen that displays all the information and work to you via the screen.
Direct data capture	This is when data is collected for a certain reason so if someone was to do a survey to see how many people would want a new facility in a area so its data that is collected for one purpose.
Indirect data capture	Sometimes when data is collected for certain reasons you sometimes find that it can be used for other purposes as well.
Main memory	Instructions and data are held in the main memory which is divided in to millions of individual addressable storage units called bytes and each byte can hold one character that becomes a part of something like a picture or sound or part of the instructions to run a software program.

Binary	This is the code that the computer uses to understand all the different pieces of data that you are entering into it and it work through using 0 and 1 and it is like a quick current that goes on and off so 0 is off and 1 is one and each character that you enter has it own code and when you input that character the binary enters the code that represents it so the computer can understand what you are doing.
Key to disc system	This is a system that is used when large amounts of data have to be typed in, the system work with one computer being the supervisors computer where he can see how quick everyone is typing and how many errors they are making a minute and then once a piece of data has been completed it is sent to a main computer that then saves the information to disk storage of magnetic tape, so a key to disc system is a system used by company that have to do batch processing data.
Capture devices	<ul style="list-style-type: none"> ❑ Keyboard - hardware item that is used to type information in to the computer. ❑ Mouse - hardware item that allows you to tell the computer what to do just through pointing and clicking. ❑ Scanner - hardware item that can capture data through copying something and then sending to the computer as a image. ❑ Barcode reader_-_this is another capture device that scans a bar code that then capture what the item was and the price which is the probably stored on a record some where.

11.2 – Verification and Validation (David Goodwin)

Accuracy	The information needs to be accurate and up-to-date. So accurate data needs to be specific.
Validity	This means whether or not the data that is used is useful to the user. Valid is if is accurate or up-to-date.
Verification	Data verification is a check to try to ensure that data entered is what was intended. So verification is whether or not the data inputted is correct. A verification check ensures that data is correctly transferred into a computer from the medium that it was originally stored on.
Transmission	The way in which data or information may be transmitted. It could have different structures. But it means the way something from one computer can be sent to another. There are many different forms of data transmissions, e-mails, and normal files.

Batch	This means the amount of data or anything. Batch is usually large amounts of data or products. But this is mainly large amount of data and information being sent or used by someone.
Processing	This means the converting of raw data to machine-readable form and its subsequent processing (as storing, updating, combining, rearranging, or printing out) by a computer.
Validation	This means an act, process, or instance of validating; especially: the determination of the degree of validity of a measuring device. A validation check is an automatic check made by a computer to ensure that any data entered into the computer is sensible. Also validation checks are important in spreadsheets to make sure that the data that is inputted meets a right and sensible level.
Transcription	This means the way in which data is transcribed into the program or computer you re using. It is also the way that something is represented or presented, like pictures and writing, these are transcribed.
Presence check	This is whether or not the right information or data is present in the system. So the verification and validation can check if all of the data is good and that it has all of the right data present and in the system.
Check Digits	This is the check for whether all of the digits in the system are right and if they correspond within the system properly. The digits are very important in systems like spreadsheets because they are used all of the time and they need to be checked to see if they are the right digits.
Format	This means that way that something is formatted in a system. The size of a file or what the file looks like. The format is important because it allows the data to be compressed or manipulated so that it suits your needs.

11.3 – Organisation of Data for Effective Retrieval (Rob Houchill)

Database	A database is a collection of data, stored in either a computerised or in some cases a non-computerised form. With the main difference between the two being the speed at which the data can be accessed. The data stored can range depending on its intended use, for example it may be a simple collection of artists and song titles on a CD or data related to students in a school.
Flat Files	Data stored in a single file is referred to as a flat file database. This allows very simple structuring of data. The software used to access and edit the file is commonly known as a File Management System.

Data Independence	When the data is independent it does not affect the programs that access the database.
Data Redundancy	Redundant data that is repeated or in an excess, for example storage of names and address multiply times may be unnecessary making retrieval of information a slower process and taking up space on the disk storage. This is problem often encountered with flat file systems but can be overcome with the introduction of relational databases.
Relational Databases	Within a relational database the data contained is stored within tables, as opposed to a flat file system where the data is stored in one file. The problems of data redundancy and adding new fields that are faced when using a flat file system are overcome when the introduction of a relational database is made.
Tables	One of the basic components of a database. Tables are what make up a database, all the information is entered into them in either of two ways; straight into the table with what Access calls Datasheet view or using a form designed solely for the purpose.
Forms	One of the basic components of a database. Forms have several advantages as opposed to using the table to enter data: <ul style="list-style-type: none"> - They have a much more user friendly appearance; - The forms can be arranged in a convenient order for data entry; - Some of the fields can be assigned default values so that the user will rarely have to enter a value; - Validation can be performed automatically; - Forms can be created that contain fields for several different tables; - Several data entry forms can be created for different purposes.
Queries	One of the basic components of a database. Queries are regarded as extremely powerful tools in databases. They are normally used to find subsets of data, such as books that may be overdue from these subsets of data mail merges can be developed using specific data.
Reports	One of the basic components of a database. When a query has been used to pick out records that meet specific criteria these sets of data can be sorted and summarised to be printed in a report.
Database Management Systems	The software that is used to update, manipulate and edit data in a computerised database is referred to as a Database Management System; there are numerous ways in which data can be organised with the most common being the relational database model. Microsoft Access is an extremely popular Relational Database Management System (RDBMS).

Primary Key	Each individual row or record of data that is contained within a database must be assigned a unique identifier; this is referred to as the primary key. The primary key must be carefully selected to ensure that it is not used twice so that confusion between two sets of data may arise.
Flat file Information Storage and Retrieval Systems	Prior to the introduction of database management systems it was common practice for departments in large companies to store data in separate files. For example Payroll, Personnel, Sales Department would individual keep separate files of data; this type of system is referred to as the flat file information storage and retrieval system.
Foreign Keys	When the primary key from a table is used to identify a record in another table it is referred to as a foreign key as it is a second (foreign) table to the original table in which it was assigned.

11.4 – Software: Nature, Capabilities and Limitations (Josh Dowson)

Serial communications	Serial refers to the transfer of data one bit at a time. Serial communications include most network devices, keyboards, mice, modems and terminals.
General purpose applications software (generic)-	<p>These programs are not used for one specific purpose as they have many other features that enable them to perform and complete different tasks. Examples of these listed below.</p> <ul style="list-style-type: none"> ▪ word processing software (e.g. Word, WordPerfect); ▪ desktop publishing (DTP) software (e.g. Publisher, PagePlus); ▪ spreadsheet packages (e.g. Excel, Lotus 123); ▪ database packages (e.g. Access, FoxPro); ▪ graphics packages (e.g. PaintShop Pro); ▪ computer aided design (CAD) software (e.g. TurboCAD); ▪ multimedia authoring tools (e.g. Macromedia Director); ▪ telecommunications software (e.g. Dial-Up Networking); ▪ expert systems software (e.g. ELSIE).

<p>Special purpose applications software</p>	<p>These can almost be considered the complete opposite to a generic piece of software, as they are made especially for one specific task. Examples of this listed below:</p> <ul style="list-style-type: none"> ▪ keeping business accounts; ▪ stock control; ▪ payroll; ▪ theatre booking; ▪ general practice (doctors) management and appointments. <p>These can be bought 'of the shelf' or they can be written especially for the user, these are known as 'bespoke' programs, designed especially for a particular task, for a particular user.</p>
<p>Operating systems</p>	<p>An operating system is piece of software that is installed to more or less run your computer. It provides an interface to make using the computer more accessible. The most well known example of this is Microsoft windows.</p>
<p>Utilities</p>	<p>Utility programs perform a range of tasks on the computer such as formatting discs, copying and deleting files or repairing damage of some kind. Examples of this include;</p> <ul style="list-style-type: none"> ▪ Norton Utilities (an integrated package of disc utility programs); ▪ Norton Antivirus (for detecting and eradicating viruses on computers); ▪ Adaptec Create CD (for writing to a CD).
<p>Multimedia</p>	<p>While this has been a separate category, all it really means is that a software program incorporates sound, graphics, animation, video and pictures. Many software programs on the internet and CD-ROM have comprehensive programs that use all these elements for entertainment and instruction.</p>
<p>DOS (disk operating system)</p>	<p>Tells the computer how to format, read and write information on to disk (either floppy or hard). It also manages devices such as printer and keyboard. It also controls the execution of application software. DOS appears as a black screen.</p>

11.5 – Manipulation and / or Processing (Carl Smith)

<p>Batch processing</p>	<p>Batch processing is when a group of similar data is collected over a period of time and then all of these are processed all at once. The transactions can be collected as input on a computer or as just as pieces of paper. All of these documents are collected together and then inputted</p>
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	<p>into a computer at a convenient time. This could be during the night, or early in the morning. Once a batch has been started it continues until it is done or until an error occurs.</p> <p>Noninteractive program, are all batch processing applications. A noninteractive program is one that, when started, continues without any human contact.</p>
Interactive processing	<p>Interactive processing unlike batch processing as the data is processed straight away. Interactive processing accepts input from humans. These programmes allow users to enter data or commands. Some of the most popular programs include word processors and spreadsheet applications, as these are all interactive.</p>
Transaction processing	<p>Transaction is a type of computer processing when the computer responds immediately to a user requests. Each request is saw as a transaction. Transaction processing requires interaction with a user unlike batch processing, which does not.</p> <p>An example of a transaction process is a, Automatic teller machines (ATM) for banks.</p>
Real-time (pseudo) processing	<p>Real-time processing happens when a computer responds instantly to an occurring event. A good example of this is when a computer controlling the flight path of an aircraft makes a instant adjustment, which is based on data input from wind speed and direction sensors etc. It is essential that these adjustments be made instantly, as this may affect the safety of the aircraft.</p> <p>Pseudo real-time processing has a delay of a few seconds, which is acceptable and does not affect safety - such as taking a book out of the library. The system needs to know the information as soon as possible, but it is not essential that the information should be processed instantaneously.</p>
Binary code	<p>In computing binary numbers are used to indicate characters and numbers. In computer processors they perform calculations of these numbers into characters and numbers. So adding these binary numbers together is vital. Normal mathematical laws do not apply when adding binary numbers. Binary numbers are made up of only the digits 1 and 0. Binary addition is fairly similar to normal everyday additions, except that it carries on a value of 2 and not a value of 10.</p>
ASCII	<p>Stands for American Standard Code for Information Interchange, and it is the most popular coding scheme for character data. It uses a 7-bit code, which can represent 128 symbols.</p>
ANSI	<p>Stands for American National Standards Institute this code is an 8-bit code used to represent character data. In addition to the regular character set in ASCII, it has extra symbols, such as some used in other languages. This code can represent 256 symbols.</p>

EBCDIC	Stands for Extended Binary Coded Decimal Interchange Code this is another 8-bit code that is used by IBM in its mainframe computers. It is a different code to ANSI and ASCII and it does not use these.
Unicode	Stands for Unicode is a 16-bit code, which can represent over 65000 symbols. This is enough for all the symbols used in all the languages in use or that have ever been used. One advantage to using Unicode is that it is easy to write software in different languages, since programmers do not have to use a different coding scheme for these different languages.
Bitmap Images	Bitmaps are based on pixels. One of the disadvantages of this type of graphic is that it does not scale well. Because if you resize a bitmap image, you may see that the images quality suffers. If you open a bitmap graphic in Photoshop and begin to zoom in on the image, you will see that the image is broken down into smaller squares at around 300-400%. And if you keep zooming in this will become easier to see. Each of these little blocks is a pixel and can contain only 1 colour.
Vector Images	Vector graphics do not use pixels and are based on mathematical formulas that represent curves and lines. Vector graphics are very smooth looking and can easily be resized without loss of image quality.

11.6 – Dissemination and Distribution (Sam Cunnell)

Dissemination	The distribution of information with out physical items, which are distributed.
Distribution	The handing out of information or data to others in physical items.
Generic Software	Word used to describe the application packages that are used to perform operations that are an integral part day-to-day business operations. These include, word processors, Database management systems, spreadsheets, and electronic mail.
Application	An application is a document, which is created for a specific purpose. An example of an application is an accounts system or a stock control system.
Spreadsheet	These allow the user to create worksheets representing data in column and row form. These are normally used for any application that uses numerical data. E.g. Budgets, cash flow. An example of spreadsheet software is Microsoft Excel.
Database	A database is a collection of data. It can be something as simple as a list of names and addresses.

Word Processor	This is a program or set of programs used to enter, edit, format, store and print documents. E.g. Microsoft Word
Presentation package Software	These are used to put together presentations, which can be delivered using a computer, attached to a projection device if required. E.g. Microsoft PowerPoint
Image editing software	Software used to edit, transfer and adjust images. E.g. Paint Shop Pro or Microsoft Paint.
Application generator	A piece of software, which allows a user to develop an application with out having to do much programming. E.g. Microsoft Access (application generator) is used to create a stock control system (application).
Report Generator	A piece of software that allows a business user to specify the format and content of a printed report to be made form using values from a database or calculations made by a computer.
Web Browser	Used to view information stored on the World Wide Web. The browser interprets the information, displays it on the screen and enables you to move between linked items.
Portability	The ability to run the same program on different types of computer. I can also refer to the ability to transfer a file from one computer to another.
Object Linked and Embedded (OLE)	This makes it possible to share information between programs. An object can be either linked to or embedded in a document. Linked → The original information remains stored in the data source, and it can be accessed through a link from the document. Embedded → The embedded object becomes part of the destination file. It has no link to the source file so if the original data is changed, the embedded object's data is not updated.
Mail Merge	A collection of data from a database or stored on a computer, which is used in a document to hold selected information. E.g. Get names and addresses from Microsoft access to create personalised letters in a word processor with individuals details on.
3½" Floppy	Thin flexible plastic disk coated in metal oxide, enclosed in a rigid plastic casing. High-density disk has a capacity of 1.44Megabytes.
Zip disk	Larger and thicker than a floppy disk. Has it's own disk drive. Hold about 100Mb of data.
CD ROM	Store around 680Mb- equivalent of 100 floppy disks. Data may e text form, graphics, photographic images, video clips or sound files. Disks are read only.
Microfiche	Computer output on Microfilm (COM) devices are used to prepare microfiche. A 4" by 6" hard copy film- sometimes seen in bookshops or libraries.
Primary Storage	A computer main memory (RAM) is known as primary storage.

Secondary Storage	More permanent form of storage to save software and data files.
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11.7 – Hardware: Nature, Capabilities and Limitations (Louise Wright)

Hardware	The mechanical or electrical parts of a computer system. - The physical, touchable, material parts of a computer or other system.
Software	The instructions executed by a computer, as opposed to the physical device on which they run (the 'hardware'). Programs or code, which controls the hardware in a computer system.
Processor	The part of the computer, which controls all the other parts.
RAM	Used for storing programs and data being used by the computer at the moment of use.
ROM	Permanently stores the <i>bootstrap loader</i> program, which is etched onto the chip at the manufacturing stage and instructs a computer to load the operating system from the hard drive into the memory.
Cache memory	This type of memory is used in the computer to improve its speed - It stores the most recently used files between the computer's main memory and the processor.
Input devices	Devices (called peripherals), which allow users to put data into the computer (e.g. keyboards, scanners, microphones, etc.)
Output devices	Devices (called peripherals), which allow users to get data out of a computer (e.g. monitor, printer, disc drives, etc.).
Auxiliary storage	Character and file storage on removable disk or tape media, such as floppy discs, zip discs, backup tape drives, CD-ROMs, etc.
'Program'	Describes a single, complete and more-or-less self-contained list of instructions.
Inputs	Computers are able to accept information from primary input sources, such as the keyboard, mouse, and microphone, and from secondary storage systems, such as disk drives and tapes.
Process	The computer can manipulate information (data) in a variety of ways, depending upon the nature of the software and the needs of the user.
Stores	A computer can store information temporarily in random access memory (RAM) or permanently by using hard disks, floppy disks, and optical storage systems (e.g., CD-ROM).
Outputs	The computer can 'print' to a screen, print to paper, print to other disks, and print over cables, telephone, and satellite for transfer to other persons. Colour monitors today come in four

	<p>popular types:</p> <p>CGA - (Colour Graphics Adapter) a colour graphics standard of 640 X 200 pixel resolution, which is unacceptable for word processing because of eyestrain.</p> <p>EGA - (Enhanced Graphics Adapter) a colour graphics standard that displays text with 640 X 350 resolution.</p> <p>VGA - (Virtual Graphics Array) a colour graphics standard of IBM that displays 16 colours or 256 colours (with a proper graphics card) and 640 X 480 pixel resolution.</p> <p>SVGA - (Super Virtual Graphics Array) 256 colours and 1024 x 768 resolution.</p>
Input device	An input device permits entry of information into a computer.
Modem	Another important output device for transferring data is the modem (modulate / demodulate), which can transfer data over a telephone line or fibre cable.
Macros	The purpose of a macro is to automate tasks involving several key presses (such as to display a spreadsheet, allow user to enter data, print it and then save it).
Types of graphics	<p>Bit mapped graphics (e.g. Paintbrush) - pixel-based where the graphics package changes colour of each pixel on the screen.</p> <p>Vector based graphics (e.g. CAD) - Object oriented, geometric data about objects saved rather than their picture (for instance, for a line, the co-ordinates of its end points, width and colour would be saved).</p>

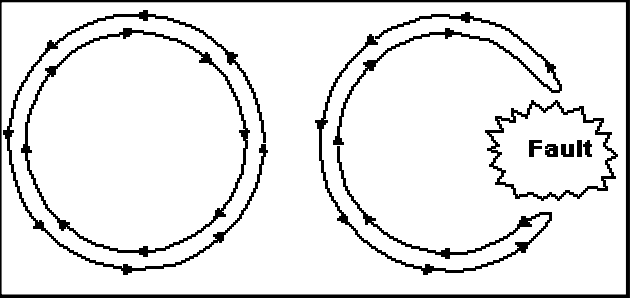
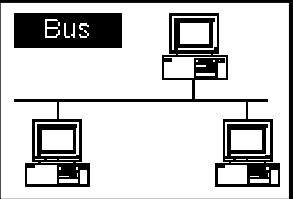
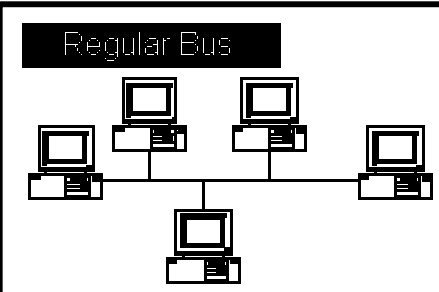
11.8 – Security of Data (Gemma Gooch)

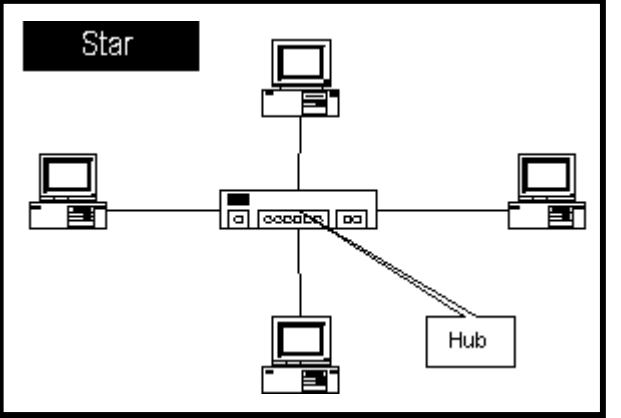
Privacy	Privacy is every persons right to have things about themselves that other people don't know. It means we have a right to not have details about us or our lives held or circulated without our knowledge and consent
Security	The security of data is keeping data, which is being held, secure, so that it cannot be accessed, copied, read, or altered by unauthorised persons. The individual holding data has a obligation to keep it secure

Data Integrity	This is the correctness of data. Data, which is incorrect and being held doesn't have very good data integrity.
Biometric Security Measures	Biometric security measures are processes of security that involve body parts; fingerprint recognition is a biometric security measure.
Periodic Backups	This is where whatever needs to be backed up is copied regularly and kept, safely. An example would be, every week copying a database and storing it safely. There are usually two backup copies made, one is stored in the building, in a safe, and the other off site.
Write Protecting	Write protecting disks and tapes is simply guarding them against being changed. For example, write protecting floppy disks is easy, you just open the little write protect window, when it is open the contents of the disk cannot be altered.
Access Rights	Individuals are given access rights to a system. Often only one person has the rights to see an entire database, and other people have access to read it, and/or change the information held. The computer can be programmed to restrict access from certain places, at certain times and certain people.
Call-back Procedure	Call-back security is when a user tries to login to a high security system, and before the computer lets them login it will call them at a prearranged number to check their right to look at the system

11.9 – Network Environments (Hannah Sawyer)

Standalone computers	A standalone computer is the opposite of a LAN computer, it is an individual computer that is not connected to a network, but may be connected to the Internet.
LAN / WAN computers	When the devices in a network are close together, e.g. in the same building, they can be linked by means of cables; this is what is meant by LAN. A wide area network is a collection of computers spread over a wide geographical area. The use of global networks including Internet has increase over the past few years, owing to: <ul style="list-style-type: none"> ▪ Change over of telephone networks ▪ Reduction of costs
Ring Topology	This is a ring / circle of computers. It consists of a set of stations connected serially by cable. There are no terminated ends to the cable; the signal travels around the circle in a clockwise direction.

<p>The counterrotating ring</p>	<p>A counterrotating ring is a ring topology that consists of two rings transmitting in opposite directions. The intent is to provide fault tolerance in the form of redundancy in the event of a cable failure. If one ring goes, the data can flow across to the other path, thereby preserving the ring.</p>	
<p>Bus Topology</p>	<p>This is the connection between each computer in the LAN that connects them to a single segment trunk. The trunk is the communication line; this is typically coax cable. The coax cable is high quality cable that makes the link between the computers on the LAN.</p>	
<p>Terminator</p>	<p>These are required to absorb the signal so that it doesn't reflect back across the bus. In bus topology signals are broadcast to all stations. Only one computer can 'talk' on a network at a time. A <u>bus topology</u> is passive. In other words the computer in the bus simply listen for a signal; they are not responsible for moving the signal along.</p>	
<p>Regular bus</p>	<p>This means that each computer is attached to the cable (called a backbone) by means of a drop cable (a shorter cable connecting the computer to the backbone.)</p>	
<p>Local Bus</p>	<p>In a local bus each computer is attached directly to the backbone in a daisy chain configuration by means of a 'T' connector. Peer-peer networks are often configured as a local bus.</p>	
<p>Star Topology</p>	<p>All of the stations in a star topology are connected to a central unit called a hub. The hub offers a common connection for all stations on the network. Each station has its own</p>	

	<p>direct cable connection to the hub. In most cases, this means more cable is required than for a bus topology. However, this makes adding or moving computers a relatively easy task; simply plug them into a cable outlet on the wall.</p>	
<p>ISDN lines</p>	<p>The amount of data that can be sent over a line depends partly on bandwidth, which is the range of frequencies that the line can carry. The greater the bandwidth, the greater the rate at which data can be sent, as several messages can be transmitted simultaneously. A network that is capable of sending voice, video and computer data is called an integrated service digital network (ISDN,) and this requires a high bandwidth.</p>	
<p>Bridges and Gateways</p>	<p>A bridge is a connection between two local area networks. Wide area networks may be connected through a system of gateways, a gateways being a computer, which acts as a point of connection between different networks.</p>	
<p>Modems</p>	<p>Telephone lines were originally designed for speech, which is transmitted in analogue or waveform. In order for digital data to be sent over a telephone line, it must be converted to analogue form and then converted back to digital at the other end. This is achieved by means of a modem (MOdulator/ DEModulator) at either end of the line.</p>	
<p>Asynchronous transmission</p>	<p>This is when one character at a time is sent, with each character being preceded by a start bit and followed by a stop bit. A parity bit is also usually included. This is known as a check bit at the end of a binary code, it checks against incorrect transmission</p>	
<p>Synchronous</p>	<p>This is the other type of transmission mode. It is sued for timing signals (usually the computer's internal clock) control the rate of transmission and there is no need for start and stop bits to accompany each character. Mainframe computers usually use synchronous transmission. It is less error-prone than asynchronous transmission.</p>	

<p>Protocol</p>	<p>In order to allow equipment from different suppliers to be networked, a strict set of rules (Protocols) has been devised covering standards for physical connections, cabling, mode of transmission, speed, data, format, error detection and correction.</p>
<p>Client – server – architecture networks</p>	<p>When different devices on the network are treated as clients or servers. The client devices send requests for services, such as printing or the retrieval of data to specific server devices that perform the requested processing. An example of this is the client devices might consist of twenty workstations in a room, and the server devices might be a laser printer and a computer dedicated to managing the network.</p>
<p>Peer-To Peer Architecture networks</p>	<p>Each workstation can communicate directly with every other workstation on the network without going through a server. This is an alternative to client-server for small computer networks. Peer-to-peer is most appropriate when the network users mostly do their own work but occasionally need to share data or communicate with each other.</p>

11.10 – Human / Computer Interface (Victoria Patmore)

<p>Command line interface</p>	<p>The command line interface is a method used to communicate with users. The method is basically based on commands, modified by parameters and switches. The command line interface can be very fast and uses less system resources than any other form of interface. Drawbacks to a command line interface are that it is not user friendly. The user has to type in a specific syntax; otherwise the computer doesn't know what to do. The commands are lengthy and complicated- also users don't like to have to memorise all the switches and parameters etc. This method of interfacing is not used that much any more, now computers are made with better interfaces that are user friendly.</p>
<p>Menu driven interface</p>	<p>This method of interfacing is where there is a list of menus somewhere on the screen. The command is built by choosing options from menus in a particular order. This type of interface is easy to use because the commands and options are all shown on the screen to the user. Errors therefore, are avoided because only valid options are displayed. It is a very easy system to learn and use.</p>

	<p>There are 4 types of menu:</p> <ul style="list-style-type: none"> ▪ Vertical ▪ Horizontal (menu bars) ▪ Pull Down ▪ Pop Up.
<p>Prompted user interfaces</p>	<p>This user interface uses prompts and a form for the user to fill in. The prompt asks for input or it issues an instruction, and then asks that the instruction be carried out. The interface can be shown in 2 ways - as a form to fill in or one at a time. When using a form fill in, the user just fills an entry and goes on to the next one when finished. In the other method, the user fills in an entry, and when that is done, the computer shows the next prompt. Prompted interfaces are very easily created by novice programmers, but are NOT user-friendly. Prompted interfaces are mainly used today on the Internet for forms.</p>
<p>Graphical User Interfaces (GUI)</p>	<p>GUI pronounced 'goeey' is a form of interface that combines elements of the other three interfaces as well as introducing its own. GUIs are very user friendly because they are graphics based. Directories are represented as folders on the desktop. An image of a printer is used to indicate the printer connected to a computer system. A GUI also introduces some of its own interface types. The use of a mouse facilitates the copying and moving of files and directories. Dialogue boxes, check boxes, buttons and tools allow simple and quick manipulation of the machine. The strength of GUIs is that they are intuitive. Very little training is required. They are simple for people to learn and use. GUIs are the interface of choice for computer systems.</p>