

- Disadvantages
- Copying data- means copyright holders lose out on money when music, games and videos are copied
  - Data can be copied quickly-means personal data can be stolen
  - Reliance on networks- if the network fails, you cannot access data
  - Security problems- data needs to be protected from viruses, hackers etc.

- Advantages
- Less storage space is needed
  - Data is easily copied, it can be copied quickly
  - Easier to back up - can be performed quickly and transferred off-site using the Internet or copied onto removable media such as a CD
  - Easily transferred
  - Fast access to stored data
  - Data can be put into a secret code when stored e.g. encrypted

# Advantages & Disadvantages to Encoding

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## Encoding of Data

- Encoding means putting the data into a code and reducing its size
- Data is often coded when it is collected on input into an ICT systems

Reasons for:

- coded data is quicker to type in
- It takes up less storage space on disk
- It is easier to check a code using validation checks
- It is faster to access data that is coded
- It is quicker to send the data over a network

Examples of encoding

- M= Male F= Female
- 19/08/10- 19th August 2010
- GB= Great Britain IRL= Ireland

- transcription (using the wrong form, mishearing words etc.)
- input (e.g. keyboarding errors etc.)
- processing (e.g. mistakes in formulas in spreadsheets etc.)
- transmission (e.g. data is corrupted as it travels through wires, cables, air etc.)

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## How Errors can Occur?

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## Problems Processing Inaccurate Data Causes

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Errors in data can cause all sorts of problems such as:

- Incorrect decisions being made resulting in loss of money, goods being sent to the wrong address etc.
- Having to spend time sorting out mistakes
- Loss of goodwill
- Loss of trust
- Being prosecuted under the Data Protection Act 1998 for not keeping accurate personal data.

- Validation is a check performed by a computer program during data entry.
- Validation is the process that ensures that data accepted for processing is sensible and reasonable.
- Validation is performed by the computer program being used and consists of a series of checks called validation checks.

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## Data Validation

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## Types of Error

- Transcription Error- errors introduced when transferring data from a form to a computer. Also caused by mishearing what a person says over the telephone and entering it into the computer
- Transposition Error- easily made when typing quickly and involves typing letters or numbers in the wrong order. e.g. fro instead of for

- similar to hash totals except the totals have meaning.
- e.g. adding up all the totals of a batch of invoices could be used to check that all the invoices had been input. The total would be the total amount owed for those invoices processed in the batch. The amounts could be worked out manually and then compared with the answer the computer calculates, any discrepancies could be checked.

#### Batch Totals

- meaningless totals used for a check
- e.g. if each survey form is numbered then the total of all the numbers could be calculated and input to compare with the answer the computer calculates. If the hash totals are equal it shows that all the survey forms have been input.

#### Hash Totals

When large numbers of input documents are used for data entry, it is necessary to check that all the documents have been input and processed properly. There are two checks:

## Hash&Batch Totals

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## Types of Validation Checks

- Data types checks- these check that **data being entered** is the **same type** as the data type specified for the field.
- Presence Check- A presence check would make sure that **data had been entered into a field**, if the field has not been filled in the data will not be processed
- Range Checks- are performed on number. They check that a number being entered is **within a certain range**.
- Format Checks- are performed on codes to make sure that they **conform to the correct combinations of characters**. e.g. a code for car parts may consist of 3 numbers and one letter.
- Check digits- are digits that are added to important numbers such as account numbers. These numbers are placed at the end of the block of numbers and are used to check that the numbers have been entered correctly into the computer. When a large number is entered, the computer performs a **calculation using all the numbers** to work out this extra number, if the calculation reveal that the **check digit is the same** as the answer it means numbers have been **entered correctly**

- bad weather disrupting the satellite signals
- cost of subscriptions

Disadvantages of satellite/cable

Many of the services that we currently use the Internet for, we will be able to access using out TV.

- interactive advertisements
- placing votes of programmes- there are plans to use this service for voting in parliamentary elections
- using email
- placing bets
- shopping
- playing games
- booking cinema and holiday tickets
- viewing extra new stores and sports coverage
- joining in with programmes by sending in comments

Digital TV features:

## Interactive Digital Television

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## Data Verification

- means checking that the data entered into the ICT system matches the source of the data.

### Methods

- Proof Reading- involves one user carefully reading what they have typed in and comparing it with what it on the data source (order forms etc.) for any errors which can then be corrected.
- Double Entry of Data- involves using the same data source to enter the details into the ICT system twice and only if the two sets of data are identical will be accepted for processing. The disadvantage is that the cost of data entry is doubled.
- Parity Checking- involves checking data after it has been sent through a wire or wirelessly. Parity checks check that the data has not been corrupted in any way.

- Many people are busy and like a faster way to meet someone
- Some people are shy and find it hard to meet people, they can chat to someone on a chat room or email

## Dating-Adv

- People may gamble more than they would when using cards.
- It can become addictive
- A credit or debit card is needed - you have to create an account before you can bet

## Online Betting Dis

- You do not have to leave the house, good for disabled and elderly
- Special Internet offers - there are special offers to tempt you to gamble more
- No need to pick up your winnings - they are added to you credit or debit card
- Quicker, you do not need to visit betting store

## Online Betting-Adv

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# Interactive Digital Television- Interactive Servic

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## Interactive Digital Television- 2

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### Pay-to-view services

These are subscription based services where you pay a monthly or one-off fee for digital TV services that include:

- satellite channels and other services
- cable TV and other services
- digital terrestrial TV and other services (like ordinary TV but with an encrypted signal)

One off fees are payable to watch:

- a specific film
- a specific sporting event e.g. Premiership football match

- Young children can learn from them
- They can make learning fun
- Some games are played online as a team, so it encourages teamwork
- They can lead to well-paid employment as a games designer, programmer, etc.

## Advantages of Computer Games

- a fast processor
- a large screen
- a large amount of RAM
- a disk drive with plenty of storage capacity
- a high quality sound and graphics cards
- large powerful speakers
- specialist input devices e.g. joystick, steering wheels etc.

For fast action computer games it is necessary to use:

# Gaming and Digital Photography- Gaming

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## Interactive Digital Television- Interactive Service

### Dating- Dis

- Need to be extremely careful.
- They may use fake information or pictures
- They may be meeting other people- can they be trusted?

### Online Voting- Adv

- Encourage more people to vote, as not much effort needed.
- People would not be needed to count the votes, so it could be cheaper.
- Results would be obtained faster
- People who are away would not need to use postal votes.

### Online Voting- Dis

- Not everyone has a computer and the Internet
- Good security system would be needed to prevent vote rigging
- It is likely to have very high initial costs

- apply filters (i.e., alter the colours in an image)
- alter the file format
- remove red eye
- crop
- re-size
- add text
- copy part of an image

Using photo editing software, you can:

Photo Editing Software

- They can be shared by attaching them to emails.
- They can be sent via mobile phones.
- They can be passed to social networking sites such as facebook, flickr
- They can be edited.

Many people enjoy the flexibility offered by digital images. For example:

Basic Digital Photography

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# Gaming and Digital Photography- Photography

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## Gaming and Digital Photography- Gaming 2

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### Disadvantages of Computer Games

- They can be addictive
- They are often a sedentary activity where little physical activity takes place, this can lead to obesity
- They can be very violent and some people think that this can cause teenagers to act violently
- They waste time- schoolwork can suffer through the time spent playing games
- Health problems- repeated use of input devices such as a joystick or mouse can lead to repetitive strain injury (RSI), also incorrect posture when sitting can lead to back ache



- a computer screen
- a printer (ink-jet printers are best)
- a TV
- the screen of a mobile phone
- a digital photo frame

The main output device is the LCD screen where you view the image. Other output devices include:

Output devices used in digital photography

## Gaming and Digital Photography- Photography 3

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## Gaming and Digital Photography- Photography 2

### Input devices used in digital photography

An image sensor picks up the light from the image. The image sensor is made up of a silicon chip consisting of millions of photosensitive diodes. Each diode is capable of capturing a pixel of light. The pixels form the whole picture. The whole map of the pixels is converted to a binary code and this is compressed before storing.

### Megapixels

The number of pixels a digital camera can detect is measured in megapixels. Generally, the more megapixels there are, the better the quality of the picture. However, increasing the number of megapixels in an image decreases the number of photographs you can store on the memory card.

### Storing Digital Photographs

Most digital cameras use memory cards, which are solid state devices that are able to store digital information. These memory cards use what is often called flash memory, which is a type of memory that can be written to and erased many times over. Examples of memory cards include:

- Secure Digital (SD) cards
- Compact Flash (CF) cards
- Memory Sticks

- Many employers and schools ban their use because some people become addicted.
- Paedophiles have been known to surf networking site pages
- Many young people share too much info on these sites and they do not realize that their teachers, employers etc., can view the info
- danger of identity theft
- You have to be on all the sites your friends use if you want to take advantage of the services they offer.

## Disadvantages of Social Networking

- Facebook- offers a way of keeping up with friends online. You set up a profile of yourself and you then decide what you want to have displayed.
- MySpace- a social networking site with a music connection holding the site together. Many bands and artists have their own pages on the site along with the pages of millions of other people. You design a profile page, and add info about your fave music.
- Bebo
- Twitter- Twitter is the simplest of all the social networking. Twitter sends your status; to your twitter friends.

Social networking is very popular. Examples of sites:

# Webcam Services and Social Networking Sites

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## Webcam Services and Social Networking Sites

### Webcams (Web cameras)

A webcam is simply a digital camera that is used to capture still images and video images. These images can then be transmitted to a computer where they can be stored in a suitable graphics format. If required, they can be published to a website.

Webcams are often included with complete computer set ups and the camera in these systems is placed on top of the screen This simple system allows videoconferencing. Webcams are not just restricted to the tops of computers. There are webcams everywhere. Here are some users:

- Distance Learning
- Advertising- cruise companies place them on the ship so that potential customers can see what is going on inside the ship and where the ship is at a particular time.
- Checking on children in nurseries- Some nurseries have webcams so that parents can see their children on computer whilst they work.
- Checking on the weather in another area of the world

### Disadvantages of Webcams

- Sometimes webcam sites show inappropriate content e.g. torture

- download and listen to music and play games
- watch live TV
- surf the internet
- take short video clips
- take digital photographs
- make phone calls
- send and receive text messages, email and picture messages

### Services obtained through mobiles

- You need a broadband connection
- The service is not completely reliable

### Disadvantages of Internet Radio

- The quality of sound is good and there is no need to adjust aerial
- you can listen to radio stations from around the world
- you can listen to programmes you missed

### Advantages of Internet Radio

## Music, Sound and Mobile Phones 2

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# Music, Sound and Mobile Phones

## Downloads

Downloads are where you transfer files off a website and then store them on your computer or portable music player. For the music files to be transferred in this way, they are converted to a file format called MP3. MP3 file format involves compressing the file so that you can store more music files in the same space. Downloads have become very popular owing to:

- the ease with which they can be obtained e.g. 24/7
- the ability to just download tracks that you want- you do not need to buy the whole album
- you can still burn the tracks to a CD provided they are only for personal use
- the ease with which they can be loaded onto portable players such as iPods, MP3 players and mobile phones.

There are a number of problems with downloads including:

- viruses could be introduced
- many people use file sharing sites to avoid having to pay for downloaded music tracks
- people who downloaded music or films illegally could be cut off from the Internet by their service providers.
- you do not have a physical CD that can be sold at a car boot sale or on e-Bay

- You are not restricted to where you can work
- you can work whilst on the move
- fewer/no trailing wires to trip over
- it is easier to keep working area clean if there are fewer/no wires
- No costs associated with sinking wires.

### Advantages of Wireless Communication

With wireless communication, the data travels through the air rather than through cables. Wireless networks enable people to connect wirelessly to the internet or to a network set up in a home. This means they can work anywhere they can get a radio signal for their network. There are many places where the internet can be accessed wirelessly using a laptop computer or PDA. These places where you can access the internet using WiFi are called hotspots.

### Wireless

Satellites are used to beam data signals from one continent to another where the terrain makes it difficult to lay cables. Communication between Britain and America is via a cable laid on the ocean bed. Data signals from one continent are beamed up to the satellite in orbit and then beamed back down to a satellite dish in another continent.

### Satellite Communication

# How Computers Can Connect to the Internet 1

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## Music, Sound and Mobile Phones 3

### Advantages of Mobile Phones

- You can be contacted in case of an emergency
- Plans can be changed at the last minute
- Parents like children to have a mobile phone as they feels safer

### Disadvantage of Mobile Phones

- Many people use their phones when walking along and this has caused accidents.
- Calls can disturb other people in the cinema, theatre, cafes etc.
- Many people still use hand-held phones when driving, which is dangerous and illegal

A router is a device that enables a network to be connected to the internet. They are frequently used in home where several computers need to share a single internet connection. Wireless routers are very popular and allow wireless connection to the internet by any computers in range of the router.

Routers

## How Computers Can Connect to the Internet 3

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# How Computers Can Connect to the Internet 2

## Disadvantages of Wireless Communication

- The danger of hackers reading messages
- there are areas where you cannot get a wireless network
- there may be a danger to your health

## Modems

Devices that enable a communication link to be set up between the computer and a medium such as a wire or cable that is used to carry the data. There are 2 types:

Dialup Modem- This is a slower more old-fashioned modem. When you log onto the internet using a dialup, it dials the number of your ISP. You are then asked for your user-ID or screen name and a password. On providing this, you are connected to the internet.

Broadband Modem- These are the latest modems and offer connection to the internet using a broadband link. Broadband is much faster than dialup and allows you to:

- use a phone at the same time
- download files at high speed
- watch TV programmes and online videos

- determine how far it is from one place to another
- see a bird's eye view of your house and its surrounding
- plan the quickest route to school/collage/work
- view the surrounding when you go the new place or go on holiday
- look at the surrounding area when you are thinking of buying or renting a property

a GIS you can:

A GIS is an ict system that is used to capture, manage, analyse and display geographically referenced information. Using

Geographical Information Systems (GIS)

- Can only be used over short distances- uses low power radio signals.
- Relatively small bandwidth- this limits its use. Wireless video is not as clear as the video transferred by wires.
- There are health concerns similar to the use of mobile phones

Disadvantages of Bluetooth

## Communication Systems 2

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# Communication Systems

## Bluetooth

Bluetooth is a method used to transfer data over short distances from fixed and mobile devices. Other Applications for bluetooth include:

- Wireless keyboards and mice avoid clutter on your desk
- Wireless headsets allowing you to use a mobile phone legally when driving
- Sharing data such as voice, music and video wirelessly with others. P
- Printing a picture from your camera phone
- Listening to music using wireless earphones
- Bluetooth webcams- these are very small and can send a picture using bluetooth to a computer without using wires. However it does not produce a good picture and the range is small

## Advantages of Bluetooth

- No wires are needed- you can connect several devices such as printers, cameras, mobile phones etc.
- You can synchronize devices
- It is very easy to use. In most cases no new hardware is needed and there is no new software to install

You can browse for goods by using a series of menus or you can enter a description of what you are looking for in a search box.

Online stores have online databases of all the goods that they stock containing information such as:

- photographs of the goods
- details about what they are
- price
- reviews from people who have bought the product

Searching for products on websites

# Home Business - Online Shopping and Searching for

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## Communication Systems 3

### Examples of GIS

- Satellite Navigation systems- you can get navigation instructions as you drive, be directed to the nearest petrol station, locate hotels etc.
- Google Earth
- Multimap- useful for maps and aerial views
- The AA- useful for finding route details from one place/postcode to another
- The energy saving trust- this site allows you to enter your postcode and it will tell you whether you could use a wind turbine to generate your own electricity.

### Advantage of GIS

- They reduce fuel consumption, making it greener
- you can arrive at your destination without delay as you can be warned about delays
- You can save money by choosing the shortest route.

### Disadvantage of GIS

- Satellite navigation systems can send you down very small and windy roads
- sometimes difficult to use

- dangers of hackers accessing your banking/credit card details
- personal data is kept about customers and this could be targeted by hackers
- networks can fail and this means customers cannot access the store
- Business lost abroad if their goods are cheaper
- Unemployment- staff in traditional shops lose their jobs

### Disadvantages of online shopping to the store

- can sell goods 24/7
- do not need to work long hours like in a shop
- can sell goods to anyone in the world
- can site warehouse anywhere that rental is cheap
- cheaper to keep in touch with customers as they can be emailed
- less shoplifting
- because of high volume of goods sold they can negotiate good discounts with suppliers
- No expensively fitted out high street stores to pay for

### Advantages of online shopping to the store

# Home Business- Online Shopping and Searching for P

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# Home Business- Online Shopping and Searching for P

Online Shopping- purchasing goods and services using the Internet

## Advantages of Online Shopping to Customers

- No opening hours- 24/7
- Goods/Services are cheaper because of lower costs of internet business
- wider range of goods to choose from
- no travelling costs to go shopping
- worldwide marketplace-you can order goods from anywhere in the world
- cost savings are passed to customers with cheaper goods
- goods are delivered to your home-ideal if people cannot get out because they are elderly or disabled.

## Disadvantages of Online Shopping to Customers

- Shoppers may be worries about entering their details
- sometimes more hassle when returning goods
- lack of personal service
- hidden costs e.g. post and packaging



Online check in avoids people with only hand luggage having to wait in a queue to check in.

- You could easily enter the wrong information and book the wrong.
- There is no personal service like at a high street travel agent
- People could hack into the site and knock you away and burgle your house
- You have to enter credit/debit details and these may not be kept safe

#### Disadvantages

- You can book from the comfort of your home 24/7
- There is more time to look for holidays than when at a travel agent.
- You can make savings when you book direct as there is no travel agent commission to pay.
- You can read reports from people who have been on the same holiday
- You can find out about your lodgings before you go

#### Advantages

### Online Booking Services

## Home Business- Online Booking and Verification of

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# Home Business- Online Shopping and Searching for P

## Battle between traditional and online stores

The losers may be:

- Some traditional stores may have to close resulting in a loss of jobs
- companies who fail to get involved in online shopping will see lower profits
- Shopping as a leisure activity may go into decline, as goods are bought online
- City centres may become deserted as shops close down
- The gap between the richer and poorer member of society may widen as richer take advantage of savings made by shopping online

The winners may be:

- As many goods are delivered straight to customers homes there is an increase in the number of staff employed in postal companies
- Those people employed to set up websites are now in great demand
- Criminals, who are now able to take advantage of anyone off guard
- People with mobility problems who are now able to shop from home

Verification of data is also used when you set up a user account with an online business you use regularly. The account is useful because you do not have to re-enter all your personal details such as name, address etc. as the online shop keeps these. You still have to do a visual check to ensure that details have not been changed. Some sites even keep your card details, which means you can order without having your card details to hand. When first setting up an account you have to enter a password twice, this is so that if the two versions are not the same the computer will query this. The site can then be sure that the password typed is the one you intended.

## Home Business- Online Booking and Verification of

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# Home Business- Online Booking and Verification of

## Booking using interactive digital TV

Interactive digital TV can be used in similar ways to a home computer. Such TV's allow you to search for holidays and place bookings in the same way as you would do using a computer

## Verification of Data

With online booking and shopping the user will type the details into an online form. In order to verify the details the user will need to perform a visual check on everything they have entered. Here are things they might check:

- credit card number entered is correct by comparing it with the number on the actual card
- card expiry date
- check all fields have been filled
- name and address details are corrects
- passport numbers against the numbers on the actual passports

- Computer Based methods of registration
- Any ICT system used for student registration should:
- capture student attendance accurately
  - capture the student attendance automatically
  - be very fast at recording attendance details
  - as far as possible avoid the misuse of the system
  - enable not only the morning and afternoon attendance to be recorded but also to record attendance at each lesson
  - be able to work out attendance patterns for individuals and defined groups
  - be relatively inexpensive
  - be able to work with other ICT systems used in the school, such as the system for recording student details.

## School Registration Systems 2

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# School Registration Systems

## Paper Based Registers

- Marks were made on a sheet of paper containing the students names, a tick would be placed next to the child's name if they were present during morning lunch and after lunch registers.

## Problems

- Registers often left unattended so could be altered easily.
- Mistakes in register entries meant registers were hard to understand
- Statistics for attendance tended to be only produced each term
- Students could register themselves and then play truant by not attending the lessons.

The cards can be topped up with money at the start of the week or daily and this reduces the time it takes for meals to be brought, as no time is spent exchanging cash.

- registration of students
- monitoring attendance at each lesson
- for the payment of meals in the school canteen
- for access to the school site, buildings and room to improve security
- for access to certain facilities such as the computer network, photocopier etc.
- to record borrowing and return of school library books, digital cameras, musical instruments etc.

Smart cards look like credit cards and they contain a chip that can be used to hold certain information. Smart cards hold more information than cards containing only a magnetic strip. They can be used in schools for:

Smart Cards

## School Registration Systems 4

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## School Registration Systems 3

### Optical Mark Recognition (OMR)

Optical Mark Recognition works by the teacher marking a students attendance by shading in boxes using a pencil. The forms are passed to the admin office where they are collected and batched together and processed automatically using an optical mark reader. As the forms are read automatically, it removes the problems of making mistakes when the marks are typed in using a keyboard. Once input, the attendance data is processed and reports can be generated, for example listing students where attendance is a problem.

#### Disadvantages

- Registration is not done in real time- if a student came in half way through a lesson this system would not record this
- Registers need to be passed manually to the admin staff
- Registers are easily altered by students
- If the forms are folded or damaged, they are rejected by the reader

#### Advantages

- OMR is cheap
- Reader can be used for other purposes such as reading multiple choice answer sheets

- total reliance on the ICT system
- there are privacy issues
- Biometric systems are expensive

#### Disadvantages

- There is nothing for a student to forget like a card
- you have to be there to register so no one else can do it for you and it cannot be altered by students
- performed in real time so the system knows exactly who has registered and when

#### Advantages

- fingerprint recognition
- retinal scanning

Biometric methods provide a fast and easy way of recording student attendance. Biometric methods make use of a feature of the human body that is unique to a particular person in order to identify them. Biometric methods include:

#### Biometric Methods

## School Registration Systems 6

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## School Registration Systems 5

### Swipe Cards

Students are given a swipe card they use for registration purposes by swiping the card using a card reader. Swipe cards are plastic cards with a magnetic strip containing a limited amount of data on it. The swipe card is used to identify the student to the registration system and some other systems such as the library system and the school meals system. The same card can be used for access to school buildings

### Advantages

- the cost of the cards and the readers is low compared to other methods
- readers can be made that are almost vandal proof

### Disadvantages

- cards are often lost or forgotten meaning that students have to be registered using keyboard
- students can be swiped in by someone else

packages

- The data can be analysed and graphs and charts can be drawn. The data can be processed using a spreadsheet
- The sent data can be stored and processed by a computer
- The sensors can be put in remote locations, and can then be sent back wirelessly or even using satellites
- You can set the logging rate
- You can set the logging period.
- The readings are taken automatically, so humans aren't needed. Meaning it is cheaper than employing a person

Data logging is where readings are taken regularly over a period of time using sensors. The main features are:

## Data Logging in School Activities

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## Management Information Systems in Schools

Managements information systems (MIS) are ICT systems that supply managers and other staff with information that can help them make decisions. For example, the attendance system might produce information about those students for whom attendance is bad. Here are how they are used in schools:

- to work out how many students will be in the new year 7 and to allocate them forms
- to decide whether a new teacher should be employed
- to work out the best way of allocating teachers and classrooms
- to decided on how best to spend the training budget to keep teaches up to date

### Advantages

- they reduce the workload for teaches in the classroom and in the office
- they can provide up to date information for parents
- they can support decision making for school managers
- they can tackle truancy effectively
- they can be used to plan timetables

### Disadvantages

- The software is expensive to buy

- Equipment malfunction can cause wrong readings
- Equipment is expensive

#### Disadvantages

- readings can be taken 24/7
- can be situated in inhospitable places
- readings can be taken faster
- the systems does not forget to take a reading
- no human error
- do not need anyone to take the readings
- readings are always taken at the exact time specified

#### Advantages of Data Logging

- Use wires to connect the data logger to the computer
- Use wireless normally bluetooth

The data from a data logger can be sent to a computer. There are two ways to do this:

## Sending data to a Computer

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## Sensors

Sensors are used to detect and measure physical quantities. Examples:

- Temperature sensors can be used in school experiments such as investigating the cooling of a hot drink.
- Light sensors detect the brightness of light. Can be used to see how different light levels affect plants
- Sound sensors measure the loudness of sound, can be used in noise disputes
- Pressure sensors- barometric pressure sensors measure air pressure
- Humidity sensors- measure moisture in the air
- Passive infrared sensors- these are the sensors in schools and homes used to detect movement.

- Security light systems- uses a PIR sensor to sense movement. As soon as the sensor detects movement the system turns the light on. After a period of time the systems turns the light off
- A burglar alarm- works in a similar way to the security light system. This time the output device is a bell or siren that sounds when the alarm is on and movement is detected.

## Simple Control Systems

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## Main Components of a Control System

- Sensors- which are the input devices that send data to the computer/processor
- Computer/Processor- uses a control program to decide what action to take when it receives data from the sensors. Once the decision has been made, a control signal is sent to the output device.
- Output device- such as lights, heaters, motors, etc. that are controlled by the control signals

### Non feedback control systems

If you are writing a simple program to control a robot arm by rotating it, you can issue instructions to a stepper motor. A stepper motor rotates in short steps and you can determine how many steps you need. This will determine the angle it moves through.

The motor will rotate through an angle and then stop. This is a non feedback system because there is no way of detecting whether it has actually moved through the correct angle. If there was an obstacle in the way of the arm, it may not have been able to move the correct angle. If another instruction was issued then it will simply move from its incorrect starting point.



In the heating system in a school, if the temperature gets too high, the heater is switched off and a fan is turned on. If it gets too cold, the fans turn off and the heater comes on. The input and the output bits can be put into a table. The first row in the table shows the way the inputs and outputs are numbered.

Example

each of the output bits.  
 on and if it is 0 it will be switched off. The control program deals with the input bits and applies rules to it in order to set Output bits (0s and 1s) control the output devices. For example, if an output bit is set to 1, a heater could be switched the temperature is too high. Otherwise it would be set to zero.  
 Input bits- (0s or 1s) are detected by the sensors. For example, the input bit for temperature sensor might be set to 1 if

## How Control Systems Work?

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# Output Devices Controlled by Control Systems

The input signals from sensors are passed to the computer, where control signals are passed to output devices to control them. These output devices include the following:

- Actuators- devices such as motors that react according to signals given to them by the computers. An actuator can be used to open a window in a greenhouse
- Stepper motor- a motor that turns in a series of small steps. The control signals tell the stepper motor how many steps and in which direction it should move. You can therefore control the angle through which the motor rotates.
- Bells/Sirens- these are used in control systems where an alarm signal needs to be sounded. Burglar alarms use bell/sirens
- Heaters/Coolers- are used for controlling the temperature of an environment. Central heating/air conditioning systems use heaters/coolers as the output device
- Light- floodlights or flashing lights are often used in control systems. For example, as well as sounding an alarm, a fire or burglar alarms system will also flash a warning light.

Sensors used for the collection of weather data:

- Temperature sensor-used to measure temperature. As well as the maximum and minimum temperatures are recorded.
- Pressure sensor- used to record atmospheric pressure
- Rain sensors -used to measure rainfall/snowfall
- Wind speed and wind direction sensors

Data is collected by sensors and then sent to the computer/base station for processing. The resulting weather information is then displayed in a variety of different ways such as:

- Using icons
- Graphically- showing how values such as temperature and pressure, change
- Using text- messages about the weather are produced
- Using numbers- values such as the maximum and minimum temperatures are displayed

## Weather Forecasting Systems

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# Advantages&Disadvantages of Control Systems

Compared to manual control, a computer-based control system has the following advantages and disadvantages.

### Advantages

- It can operate continuously 24/7
- It is cheaper- no need to pay wages
- It can work in dangerous places
- It is easy to change the way the device work by re-programming it
- It is more accurate than humans
- It can react quickly to changes in conditions

### Disadvantages

- The initial cost of equipment is high
- The equipment can go wrong
- Fewer people are needed to leads to unemployment.

- Volume- can be changed using the control panel. You can set the master volume and also change the
  - Contrast- Contrast determines the difference between the dark and light parts of the screen.
  - Graphics- you can change the screensaver, background, customize icons and more
  - Position- you can alter the position of elements on the screen such as windows and toolbars.
  - Colour- you can change most of the colours used for the desktop.
- This can be done by increasing the dpi
- Desktop fonts- text and other items such as icons that appear on the screen can be made bigger or smaller.
  - size. Higher screen resolutions mean items on the screen are sharp but small.
  - Screen resolution- This determines how sharp the icons etc. appear of screen. It also determines their and people with poor eyesight:
- You can have large, medium and classic. By making icons bigger you can improve the use by children
- Icon Size- If you right click the mouse button when on the desktop, you can adjust the size of the icons.
  - works and alter the speed of the scroll wheel.
  - Mouse settings- you can change how the mouse button work, how the mouse pointer looks and how it
  - Adjusting window size- windows can be maximised, minimised and made any size between

of: [Icons](#), [Windows](#), [Toolbars](#), [Folder](#), [Help](#). Making Changes:

A desktop environment is a graphical user interface that allows a user to change certain settings of the operating system. These settings can include changes to window size, mouse settings, icon size, screen resolution etc. Is normally consists

## Changing the Settings in the Desktop Environment

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# Adv&Dis of ICT-based Weather Forecasting Systems

## Advantages:

- Data can be collected automatically
- Data is collected at exactly the correct time
- Mistakes are not made when taking readings
- Weather data can be collected from remote and inhospitable places
- Data can be transmitted using radio/satellite communication
- Output can be in different forms e.g. video, audio etc

## Disadvantages

- Equipment is expensive
- Malfunction of equipment may lead to incorrect forecasts.

No-one can remember the steps you need to take to change settings. Instead, all you need to know is that it is possible to make the changes and then be able to access the online help. The online help gives you the instructions you need to make the changes.

## On-screen help

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# Things You can do with Files&Folders

Because of the large number of files you store on a computer, over a period of time you need to be organized in the way you maintain them.

You need to think carefully about the filenames that give you some idea of their content. Files should always put into folders so that they can be found quickly when needed. In order for you to use ICT successfully you need to be able to do the following on files and folders:

- move
- copy
- delete
- rename

Shortcuts enable you to do a task using the operating system quickly rather than go through a series of menus/windows, which takes time. There are keyboard shortcuts where you enter key combinations rather than go into the control centre to change settings. The trouble is remembering the combination of keys is not easy. Shortcuts to programs are handy if you want to access a program or file directly from the desktop by double clicking on an icon.

## Shortcuts

Using windows you can create a password, which means other people cannot access the computer without knowing the password. This prevents someone waiting up to our computer and being able to use it or view the files and programs on it.

## Password Protection

The print settings allow you to add or remove a printer and also set which printer will be used if you do not specify a particular one.

The print settings can be used to tell the computer which printer you want to use. It is important to note that when you use a network there are often several computers to choose from. For example, you may want a colour copy

## Print Settings

# Print Settings, Shortcuts & Password Protection

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## Features of a Control Panel

The control panel is part of the operating system used to change the look and settings of Windows. Here are some of the features of the control panel:

- You can alter the colour of the desktop and windows.
- You can set up hardware and software
- The settings can be changed to cope with a variety of disabilities
- You can change the way folders are used and displayed
- You can change the way the computer connects to the internet
- You can set up user accounts
- You can set up parental controls
- You can install or remove programs
- You can set up security such as passwords and updates

- The software is often complex and uses lots of animation and graphics which makes it expensive
- Students often need the interaction of their classmates in order to learn
- Can present an opportunity for students to have a break rather than work on the online tutorials
- It is hard for teachers to gauge progress using some of the packages
- Lack of flexibility as human teachers can explain things in different ways.

#### Disadvantages

- Students have the flexibility as to where they want to learn
- Materials are provided in lots of different ways (i.e. they make use of multimedia) , such as text, voice, video, animations
- You can access the material using a variety of different hardware such as laptop, PDA, mobile phone with MP3 player, iPod etc.
- You can learn in many different environments such as in a car, while out running etc.
- They keep students using them interested and motivated by the variety of activities
- Students can work at their own pace
- They do not have to worry about getting things wrong- the computer will not judge them

## Advantages of Online Tutorials

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## The Features of Online Tutorials

Online tutorials use ICT to help you learn about a subject or topic. There are a variety of ways online tutorials can be run on a computer: The software can be run straight from a CD or DVD, It can be installed and run from a network, on its own or in conjunction with a VLE, The software can be run over the internet.

The features of online tutorials include:

- Use ICT to teach a subject or topic
- Content- to instruct students in the subject
- Simulations- to help students understand complex situations
- Animations- help students understand how things work.
- Drill and Practice- help students consolidate the learning
- Tests- let students know how well they have learnt the topic
- Games- introduce fun into the learning process
- Learning can be done at a distance

- Homework can be set and tailored more to individual ability
  - It allows teachers to set up blogs- this allows students to discuss their work with each other
  - It allows peer assessment- this means that the students mark each other's work
  - It allows teachers to return marked work student work
  - teachers
  - It allows students to submit their work electronically- projects, essays, assignments etc can be submitted to the
  - Communication- it allows student to communicate with each other and also with their teachers
  - can access them
  - It allows teacher to upload content- they can put their notes, presentations, videos etc on the VLE, so students
  - the computer
  - It allows students performance to be assessed using tests and assessments that are marked automatically by
- A VLE is a software system that uses the Internet to support teaching and learning in a school, college or other education institution. The main features are:

## Virtual Learning Environment (VLEs)

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## Online Assessment

Online assessment is where you take a test or an examination online. Online assessment is often provided as part of online tutorials, so once you feel you understand a topic or subject, you can take a test or assessment on it.

### Advantages

- The results are obtained immediately
- You can analyse what you did well on and what you did less well on so you can target your revision
- It frees up teacher time, as there are no assessments to mark

### Disadvantages

- Danger of hackers accessing the system and changing marks.
- Reliance on equipment that may go wrong
- Only suitable for certain types of assessment, as it would be hard to get a computer to mark an essay

Touch sensitive data entry devices allow a person to make selections by simply touching a screen. They are used as input devices for purchasing train tickets or used as information points in tourist information offices. They can also be used to provide information on services provided by banks and building societies. Mobile Phones use them as do satellite navigation systems. The main advantage of the touch screen as an input device is that it is so simple it is capable of being used by almost anyone. It can be used by people who have poor coordination skills who would find it hard to use a keyboard.

#### Touch Sensitive Data Entry Devices

Microphones can be used to issue instructions and enter text into computer systems. They can be wired or wireless. Wireless microphones are useful because you can wander around the room whilst issuing instructions or dictating. Microphones are ideal input devices for people with certain disabilities that prevent them from using a keyboard.

#### Microphones

There is a huge range of specialist input devices that can be used by people with disabilities and help them learn. Braille keyboards are used to enter text into a computer and are used by blind or partially sighted people.

# Learning Devices & Software to Support Disabilities

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## Adv & Dis of VLEs

### Adv

- Students can access the VLEs using any computer or portable device that will connect to the internet
- Learning can take place at any time- the student is not restricted to learning only in lessons
- Students can assess themselves at any times- this makes them feel more responsible for their own learning and progress
- Individualized learning- students can do work that is more closely matched to their ability, they do not have to wait for others to catch up

### Dis

- The software is very expensive
- There is a danger of hackers altering reports, test marks etc
- Staff need a lot of training to use them
- Entering content can be time consuming



Text to voice software enables a computer to read text that has been typed in, or it can be used to give some sort of response such as the direction instructions in a satellite navigation system. The system can be used by visually impaired users to check what they have typed in using a Braille Keyboard. The output devices for a speech synthesis system are headphones or loudspeakers.

Text to voice software

all the noise.

- background noise causes errors-you cannot use it in noisy situations as the software will attempt to convert there is confusion with similar words e.g. two and to correcting the mistakes.
- it is not accurate at first- the software needs to get used to your voice/accents by you speaking and then it takes a while to get used to - and can be frustrating to use at first

Disadvantages:

Voice recognition continued

# Learning Devices & Software to Support Disabilities

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## Learning Devices & Software to Support Disabilities

### Voice Recognition Software

Voice recognition software allows you to enter data by talking into a microphone. The voice recognition software can be used to:

- enter text into word processing software
- enter text into emails
- issue commands to the operating system
- enter data into a database

Voice recognition software works by recognizing spoken words and turning them into text that can be put into a variety of software packages. You basically speak into a microphone, which can be wired or wireless (usually making use of Bluetooth) , and your speech is recognized as text or instructions. Advantages:

- faster than typing-most people can talk faster than they can type
- accurate-provided time has been spent with the software teaching it how to recognize your voice
- cheap- it is cheaper to dictate yourself than pay someone to type, and the software and microphone are inexpensive.

in the country. This means that an organization can type in the postcode and the full address will appear, which saves. For example, there is a CD-ROM produced by the Royal Mail that contains the address detail that will all the postcodes. CD-ROMs or DVDs - these are most often used for the transfer of video and music files but they can hold large databases. of people are working on the same project and they need to show others what they have done.

Files on Removable Media - many people work on many different computers, so they need a way of storing and transferring files. Often work is stored on removable media because it is easy to transfer files to other computers. Sometimes a group create a document using word-processing or desktop publishing software.

Files on Disk - Many computers have pre-installed software that is ready to use when you buy the computer. For example, you may have an Office suite of software on your computer and you may use the library clip art and images when you

- files on disk
- files on removable media e.g. pen drives, flash drives, memory sticks
- CD-ROMs or DVDs
- databases
- the internet

as:  
Organizations need information in order to function and this information can come from a variety of different sources such

## Sources of Information

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# Learning Devices & Software to Support Disabilities

## Customized Desktop Environments

There are many ways in which the desktop environment can be changed to suit the needs of a user who is disabled. The desktop environment can be changed in the following ways:

- You can use an on-screen keyboard and use a mouse or joystick to point and select letters from it.
- You can use an on-screen magnifier that will blow up certain areas of the screen
- You can use what is called the narrator to read out text that appears on the screen
- You can choose to use voice recognition to type in text or issue commands
- You can alter the combination of colours used (this is useful for users who are colour blind)

Some software, called specialist software package, is developed for a particular application. For example, there is software that helps in the running of a school. It helps keep details of staff, students, timetables etc. It would only be of use in a school. Other examples include software to run libraries, software for garages etc. Applications software is written in a programming language by a person called a programmer. The programmer designs and then puts together the step-by-step instructions that tell the computer what to do. The whole set of instructions to do a task is called the programming code.

- word-processing
- spreadsheet
- database
- desktop publishing
- presentation

Some software, called general purpose software, can be used in any type of business. General purpose software includes:

- That is will work with the hardware that you are using
- That is will work with the operating system that you are using

Applications software, you need to make sure of the following:

Applications software is software that is capable of doing a specific job. A job is called an application. When you buy applications software, you need to make sure of the following:

# Applications Software

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## Sources of Information 2

Databases- these are stores of data that you can buy or set up yourself and access in a variety of different ways. Schools keep large stores of data about their present and past student that can be searched using information such as students in a form, student who attendance is poor, details of student who get free school meals etc.

The Internet- this is the biggest store of information and the most popular source of data, as you access it using so many different devices such as computers, PDAs, mobile phones etc. Software called search engines are using to find information by putting in the search criteria.

Deleting means removing some of the data from a data handling system. For example, a person may no longer want to receive mail from a certain company, so they will need to be removed from their mailing database. Here are some situations where data needs to be deleted:

- Where personal information is wrong and a data subject has asked for it to be deleted
- When a person dies
- When a customer has not placed an order for a certain period of time

It is important to delete data for the following reasons:

- You can waste money sending mail shots and other correspondence to people who have moved.
- It is a requirement under the Data Protection Act that personal information that is incorrect should be either corrected or deleted.

## Deleting

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## Updating

Updating means bringing data up-to-date because of changes that may have occurred since the data was originally input. There are many situations that result in the data needing to be changed, here are some of them:

- A woman changing her surname when she gets married
- A person changing their credit card
- A person changing their address
- A person changing their car
- A person paying a bill

File: A collection of related records is called a file. The group of records for all the pupils in the school is called the

Record: The detail relating to a single thing or person is called a record. A record consists of fields.

Field: A field is an item of data. In other words it is a fact. A surname would be an example of a field.

Information: Information is data that has been processed into a form that is useful to the user

Data: These are facts about a specific person, place or thing.

Fields are always COLUMNS.

You can build a simple database by organizing the data in rows and columns in a table. Records are always ROWS and

- spreadsheet software
- database software

There are two types of software you could use to produce a database:

Choosing the Software to Create a Database Structure

Information handling software is used to put data into a certain structure. Once the data is put into this structure it can be manipulated and output in lots of different ways.

# The Structure of Data in Information Handling Syst

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## Sorting&Searching

### Sorting

Data can be sorted into ascending or descending order and it can be sorted on one or more fields.

Ascending order: in the case of numbers the smallest number is first and the largest number is last. In the case of text the letter Z is first and the letter A is last. Reasons for sorting data include:

- If lists are printed, then it is easier to find a particular person if they are ordered according to surname.
- You can identify who your best customers are by the amount they have spent in a year. To do this you can sort them according to the total amount they have spent.

### Searching

In order to narrow down information can restrict it by asking only for data satisfying certain criteria. For example, in a list of all the pupils in a school, we might only want a list of boys. This is classed as searching using a single criterion. The single search criterion could be as follow: Sex=Boys. Searches can also be multiple criteria. This means that data is being searched for using more than one criterion. For example, we could search for all the boys in a school born before a certain date, Sex=Boys AND Data of Birth< 01/09/99

- Reports should have a relevant title
  - The report should contain a date. Information changes, so the person looking at the information needs to know that it is the latest version.
  - Only data or information that is important should be included.
  - The details of the report should be clearly laid out
  - The report should present the information in the clearest way possible
  - The pages of the report should be suitably numbered
- Reports are used to prevent the output from an information system. Reports are used to present the data in such a way that it is more suitable to printing. Here are some points about reports:

## Outputting Information in Report Format

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## The Structure of Data in Information Handling Syst

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**Table:** In databases a table is used to store data with each row in the table being a record and the whole table being a file. When only one table is used, it is a very simple database and it is called a flat-file database. For more complex databases created using specialist database software. lots of tables can be used and such a database is called a relational database.

**Key Fields-**A keyfield is a field in an information handling system that is unique to a particular record. For example, in a file of all the children in a school a record would be the details about a particular pupil. The key field would be a Pupil Number, which would be a number set up so that each pupil is allocated a different number when they join the school. No two pupils would have the same number. Surnames would not be unique so it is unsuitable for a key field. It is possible to have more than one key field in a record.

### Searching for Information

**Search engines:** Search engines are used to find information on the internet but they can also be used to search for information on an organization's intranet

**Keyword searches:** All information stores provide ways of searching for information using key word searches. When information is sought, the person searching for the information may not know such things as they key field and they have to use several key words.

If there are a small number of options that a user can type in for a field you can set these up in the form of a list. The user is presented with a list of possible data and they simply click on one of them to choose it. For example, sizes could be presented as a list such as S,M,L,XL. Lists restrict the user to allowable data. Of course the data can still be incorrect as the user could click on the wrong item in a list.

Lists

When data is being entered into a structure it is important that certain types of error are spotted by the data handling software. The user can then be alerted to check and possibly re-enter the data. When the structure of a store of data is being designed, a series of validation rules can be devised to govern what can and cannot be entered into each field. It is impossible to trap every type of error; if someone's address is 4 Bankfield Drive and the user incorrectly types in 40 Bankfield Drive, then no simple validation check would detect this. The main types are range, presence and format checks.

## Validation Checks & Lists

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## How Simple Calculated Fields are Produced

Calculated fields are those fields whose contents are worked out from data in other fields using calculations that the information handling software performs. New fields can be created containing the results of calculations and these are called 'calculated fields'. For example, you might want to multiply the price of an individual article by a quantity to give the total price. To do this a new 'total' field would be created to contain the results of a calculation involving the other two fields.

There are a number of ways information handling software can provide faster access to data:

- Search engines can be used to quickly access information on the internet
- Key word searched can be performed
- Search criteria can be used to extract specific information from huge databases
- Information searches can be performed even if only part of the search details are known. For example, a car could be searched for if only part of the registration number is known and a few other detail such as a white Honda.

Faster access to data

- Faster access to data
- A variety of output formats
- Improved data integrity

Information handling packages offer many advantages which include:

# The Benefits of Using Information Handling

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## Input Masks

In some fields, data might all have the same format, so to simplify data entry an input mask can be used. The input mask supplies the invariable characters in a field so that the user need only enter the data that differs from one field to another. This is best illustrated by taking an example of entering telephone numbers. If all the telephone numbers to be entered have the same format (0151) 876 2341, for example, we can use the input mask to supply the brackets and space between blocks of numbers.

As well as saving some input time, input masks help to ensure that the data entered adheres to a format. If an order number field contains customer numbers that each start with a single letter of the alphabet followed by four numbers, this can be specified in the input mask. Microsoft access uses the following mask characters. Note the difference between 'may be entered' and 'must be entered'.

For a telephone number such as (0151) 876 2341 we could use the following input mask (0000) 000 0000. But if we want dashes between the groups of numbers we should instead use this mask (0000)-000-0000



- Explaining to users the need to use passwords that are not easily guessed.
- Telling users not to write their passwords down
- Training so that users understand that they should keep their passwords private
- Ensuring that users change their passwords on a regular basis

Password protocols are steps that need to be taken regarding passwords such as:

Password Protocols

unauthorized access.

to data and the password ensures that the person using the systems is who they say they are. Passwords protect against Access to files is restricted using usernames and passwords. The username allocates the user with certain access rights

Password Protection

transferred off-site. It is also more secure because of restricted areas.

Data held in information handling systems is more secure than data held manually mainly because it is easily copied and

Security Issues

## The Benefits of Using Information Handling 3

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## The Benefits of Using Information Handling 2

Variety of output formats

Information contained in manual systems can only be output on paper, but with information handling systems the information can be output in a variety of different formats such as:

- on screen
- as hard copy
- as a copy on a disk or other removable media
- as sound

Data integrity

Data integrity means the correction of the data. As soon as some of the data contained in the database is discovered to be inaccurate, the users start to lose faith in all the data in the database. To make sure data integrity is maintained you can:

- ensure that errors are not introduced when data is input into the system, by using verification techniques- these include visual checks and double entry of data
- Use validation checks- these will ensure that only data which passes the validation checks to be entered
- Ensure that the data is updated regularly, and that data no longer needed is deleted

- specify who is responsible for the taking of the backups
- specify how often the backups are taken i.e every house, every day etc.
- state what media is used for the storing of backups
- specify where the backup copies are kept e.g. fireproof safe, kept off site
- specify how any data can be recovered from the backups
- ensure that staff are trained in the recovery of data from backups

Backup procedures are needed to:

Information handling systems store huge amounts of information and this must be protected against loss. Backup copies of the data must be kept and procedures must be put in place to ensure that data can be easily recovered from the backups.

Backup Procedures

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## The Benefits of Using Information Handling 5

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## The Benefits of Using Information Handling 4

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### Access to rights to data

Access rights are given to staff by the network manager. These rights allow certain staff to access only certain files. For example, a member of staff who deals with customer orders can have access to those files such as the customer file needed to perform their job. This member of staff would not be given access rights to the personnel or payroll files. In addition to this, access rights determine what you can do with the data in the files you have access to. For example:

- Read only access- you can only look at the data and not alter it
- Read/Write- you can view and alter data
- Create- you can create new records.
- Delete- you can delete records

Here are the main features of email:

- Search- allows you to find an email using keywords in the title or you can search for all the emails from or to a certain email address
- Reply: This allows you to read an email and then write a reply without having to enter the recipient's email address. As the recipient is sent both the original email and your reply they can save time because they know what your email is about.
- Forward: If you are sent an email that you think others should see you can forward it to them. An email for example sent to you by your boss, could be forwarded to everyone who works in your team.
- Address book: In the address book are the names and email addresses of all the people to whom you are likely to send email. Instead of having to type in the address when writing an email, you just click on the email address or addresses in the address book. You can get the email software to automatically add people to your address book if they have sent you or you have sent them an email.

## The Facilities Offered by Email 2

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# The Facilities Offered by Email

## Creating a standard outgoing signature and message

Email signatures allow you to add a personal touch to your email by adding some of the following:

- name
- screen name
- address
- phone number
- job title
- favorite quote

Signatures can be added after you have composed you email by clicking on the signature button. You then get a window where you can enter the details for your signature, The email program will remember this for next time so you only have to enter it once. You can have lots of signatures depending on who you are sending the email to and each signature can be given a name.

If you want to send more than one file, you can select a group of files and attach them. Usually, if there are lots of files to send, the files will be compressed to reduce the time taken to send them.

You can attach files to emails. You could attach a file containing a photograph of yourself obtained from a digital camera, a piece of clip art, a picture that you have scanned in, a long document etc. You can attach more than one file to an email, so if you had 6 photos to send, then you can attach them all. Before you attach a file you must first prepare an email message to send, explaining the purpose of your email and also giving some information about the files that you are sending. Once the email has been completed, you click on the file assessment button and select the file you want to send. A box will appear to allow you to select the drive, folder and eventually the file that you want to send.

File Attachments

## The facilities offered by email 4

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# The Facilities Offered by Email 3

## Groups

Groups are lists of people and their email addresses. They are used when an email needs to be distributed to people in a particular group. For example, if you were working as part of a team and needed to send each member the same email, then you would set up a group. Every time you needed to send the members of the group email, you could then just send the one email to the groups thus saving time.

## Using CC (carbon copy) and BCC (blind carbon copy)

cc means carbon copy and it is used when you want to send an email to one person but you also want others to see the email you are sending. To do this you enter the email address of the main person you are sending it to and in the box marked cc you enter all the email addresses, separated by commas, of all the people you wish to receive a copy.

bcc means blind carbon copy and this is where you want to send an email to one person and others but you do not want the others to see each other's email addresses.

- Virtually instantaneous - mail is sent immediately and a reply can be received as soon as the recipient checks their email box.
- No need for the formality of a letter. Email is meant to be quick and to the point. You do not need to worry about spelling mistakes.
- You can easily attach a copy of the sender's message with your reply so they do not have to search for the original message
- If you discount the cost of hardware and software that the user will probably already have, then an email is virtually free to send.
- Emails can be accessed using a large number of devices from mobile phones to television.
- Emails are more environmentally friendly since less energy is used in delivering the mail from source to destination

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## The Advantages of Email

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## The facilities offered by email 5

### Create and Manage an address book

An address book is part of an email package and it is here you can enter all your contacts details such as names, addresses, telephone numbers and email addresses. Setting this up takes a little time, but once it is set up it is easy to send emails because you only have to click on the name and the email address is automatically entered. You can also set the address up so that everyone who sends you an email has their address automatically added to your address book.

### Organize and Name Email groups and Files

Rather than keep all the emails together it is better to be organized and set up folders. The way this is done depends on the email package you are using. When sending emails you can organize them in a similar way. For example, you could keep your personal emails in a separate folder to school/college-related work. It is important to remember to back up emails.

- Formatting Text to Make it Stand Out - Text can be made to stand out by formatting it in a number of ways, font type changed the shapes of letters and numbers, font size used to make headings subheadings stand out, bold italics and underline are used to draw attention to text.
- Aligning Cells - When you enter data into a cell, the spreadsheet automatically aligns the cells, numbers are aligned to the right, text to the left. Do not put any spaces in front of numbers in order to align them as this will make it impossible for the spreadsheet to use the numbers in calculations. If you want to align the data differently you can use the alignment buttons.

Data can be presented in cells in a variety of different ways:

#### Cell Presentation Formats

Formatting cells to match data types

If the general number format is used the numbers will be shown with up to eleven digits. A cell that has a formula typed in will show the results of the formula rather than the formula itself. Cells need to be able to hold the data you want to put into them. The spreadsheet will interpret the data you put into the cell. What is displayed in a cell depends on the cell format. Although each cell is set the general number format, it can change automatically depending on the data you type in.

## Formatting Techniques & the Benefits of Using Spread

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## The Measures that need to be taken to Prevent the

There are a number of misuses of email services and precautions need to be taken in order to prevent damage from these misuses. The precautions include:

- Email monitoring- this can be done by the state to detect and prosecute and terrorists and criminals. It can also be performed by software that automatically detects abusive emails or those containing inappropriate language. Monitoring can help prevent cyberbullying.
- Email parental control- Parents can set whether their children can send or receive email or just to or from selected people.
- Email encryption- encrypting email messages means they can only be read by the intended recipient.
- Spam- use software called a spam filter that will remove spam automatically
- Virus Attack- attachments to emails should not be opened unless you know who they are from or they are from a trusted source. The latest virus scanning software should be used to ensure any viruses that enter are discovered and removed.

A thesaurus is useful for ensuring that you use a variety of words in a sentence. This allows you to highlight a word in a document and the computer lists alternative words with similar meanings.

Thesaurus

Nearly all word processors contain a dictionary against which all the words in a document may be compared to check their spelling. Most allow you to add words to the dictionary, which is useful if you use special terms such as are used in law and medicine. It is important to note that spellchecking a document will not get rid of all the errors.

Spellchecker

## Spellchecker & Online Thesaurus

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# Formatting Techniques & the Benefits of Using Spread

- Borders and Rotating text- Using borders you can: put a border around cells or groups of cells, shade in certain cells or groups of cells. Rotating text is useful when you want a narrow column but the column heading is wide.
- Adding colour- Colour may be added to text, borders and background colours for cells.
- Cell Merging- Sometimes a label may be too big to fit into a single cell and when this happens it can be made to overflow into the other cells. This is called cell merging

The benefits of using spreadsheet software

There are lots of benefits in using spreadsheet software such as:

- You can perform 'what if' investigations- you can make changed to the spreadsheet values to see what happens.
- Automatic Recalculation- when an item of data changes, all those cells that are connected to the changed cell by a formula will also change
- Accurate calculation- provided the formulas are all correct, the calculations on the numbers will always be correct.
- It is easy to produce graphs and charts- once the data has been entered, it is very easy for the spreadsheet to produce graphs and charts based on it.

- font types: the style of the letters and numbers used
- page layout: margin, justification, indents, line spacing, page numbering.
- special formatting: bold, italics, etc.

Rather than create a design from scratch, you can use a design that has already been created. These designs are called templates. Some templates allow you to alter them slightly. The template will often guide you through a series of choices that will tailor-make the design. Some programs include their own set of designer templates for a variety of documents. Templates determine the structure of the document. They set things like:

Style Sheets  
It is important to make a document consistent through all in pages. Style sheets are used to help make the text, headings and subheadings consistent throughout all the pages in a document. It means that a heading or subheading is changed once in the style sheet and all the headings or subheadings throughout the document will be changed automatically.

## Automatic Routines

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## Mail Merge

### Mail Merge

A mail merge involves combining a list of, say, names and addresses, with a standard letter, so that a series of similar letters is produced, each addressed to a different person. The list is created either by using the word-processor or by importing data from a database of names and addresses. The letter is typed using the word-processor, with blanks where the data from the list will be inserted. Here are the steps involved:

- Create a letter to be sent to different people
- Create a name and address list for the recipients of the letter
- Insert the variable fields into the letter.
- Merge the names and address detail with the letter to produce the personalized letters.



automatically used to create the contents list.

You can identify headings to put into the contents manually or you can specify that all the headings and subheadings are Contents are a list at the front of a document outlining the headings and the subheadings of material in a document.

Automatic table of Contents Production

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## Automatic Routines 3

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## Automatic Routines 2

### Headers and Footers

Headers and footers are used to hold information that appears at the top of the page in the case of a header, and at the bottom of each page in the case of a footer. Headers are placed in the top margin whilst footers are placed in the bottom. You can choose whether the text included in the header or footer is included on every page or just some of the pages. Page numbers, dates, titles, company logos, author's name and the filename of the file are often put in headers and footers.

### Pagination

Pagination is concerned with the appearance of the text on the page and it determines when a page finishes and a new page starts. You could of course leave it to the computer to sort all this out but there are problems in doing this.

For example, you may find out that a heading appears at the bottom of a page where the reader is least likely to look. It would be even worse if the heading appeared at the bottom of the page on its own with the text to which it refer over the page. It is therefore important during the proof reading process to look out for this and correct it. You can make the computer start a new page by inserting what is called a page break.

Pagination is also concerned with the way pages are numbered. Pages in documents should always be numbered, as people need to refer to the content of the page by its number.

Tabulation means to arrange information in tabular form by condensing it and listing it.

Tabulation

software.

Once the file has been opened by the software you want to use, you can save in it the normal file format used by the

This flexibility means the file can be used by a lot more people.

or put into a DTP package such as publisher. Packages that are not part of Microsoft Office could be used to read the file.

This means that you could read the file using the spreadsheet software Excel or use the database software called access

(CSV). The reason for using a CSV file is that it can be loaded into most other software packages including DTP software.

When data is to be used by lots of different packages it is best stored as a file format called a comma separated value

Comma Separated Value/Variable files

spend time correcting this.

If the data is not saved in the same format, you may find that some of the formatting is lost and you may have to

## DTP Techniques 2

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# DTP Techniques

## Justifying (aligning) text

Justifying text mean aligning the text in some way. Align left lines the text up with the left margin but leaves the right had side ragged. This is the most common align.

## Font Type and Font Size

Changing the font type alters the appearance of the characters. Font types are given names and you can change the font by selecting the text and then clicking on the correct part of the formatting toolbar shown below. You can also alter the font size.

## Font Styles

Font styles include bold, italic and underlining. These can be used to highlight certain words or text in order to draw particular attention to them.

## Important Different File Formats

Sometimes data you want to use in a document has been created in a different package. You could of course simply print the document out and then key the material into the DTP software. This takes times and effort. It is usually possible to import the data into the software you intend to use to process the data.

You can use an image such as a photograph or graphic as a background to a document. The image has to be adjusted so that it is very light because there needs to be contrast between the image and the text. A very light image used as a background is called a watermark.

Watermarks

- It can be resized
- It can be rotated through a certain angle
- It can be mirror imaged
- Part of the image can be cropped

Once a graphic has been obtained it may need adjusting in some way. Graphics software is available that allows you to alter images. Here are some of the ways that an image can be manipulated

Manipulation of Graphics

## DTP Techniques 4

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## DTP Techniques 3

Tables

Tables are ideal for organizing facts and figures and they are easily created. You only have to specify the number of columns and rows in the table. There are also lots of pre-stored styles of tables to choose from.

Borders

A border can be used to add more emphasis to a word, section of text, paragraph or table. A border can be just a line or you can have a picture border such as a row of Christmas trees around the edge of a page. If you look at the selection of clip art, then it usually includes a good selection of picture borders.

Single and Double Line Spacing

Line spacing, as the name suggests, refers to the spacing between each line in document. Single line spacing- this is just normal line spacing. The computer will apply single line spacing to a document unless you tell it otherwise. Double line spacing- a single blank line is left between each line of text. For example, when work needs to be marked, space needs to be left so that the marker can leave their comments. Sometimes a document is produced and other people need to look at it and make corrections or insert comments, so double spacing is used.

Transitions

on what the user has typed in.

One way of providing a link is for the user to click on an image. You can also link to different webpages or slides depending

view files that have been created using software such as word processing software.

the material by clicking on the links. As well as providing links to webpages and slides, the links can also enable users to a series of webpages or slides does not have to view them in a set order. The user decides the order they want to view Links provide a way for the user to move from one webpage or slide to another. The use of links means that a user viewing

Links

slides and webpages. You can produce your own animations using programs such as Flash.

the same way as you can get clip art off the internet. Some of these are copyright free and you can include them in your Animations can range from a simple moving logo or banner to a full length cartoon. You can get simple animations in much

Animations

## Presenta

# Good Practice in Designing Webpages & Slide

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## DTP Technique 5

### Autoshapes

AutoShapes are shapes that are already stored by the software. You can select the shapes from the various menus and edit them. The autoshapes can be seen on the drawing toolbar and include:

- lines
- connectors
- basic shapes
- block arrows
- flowchart symbols
- stars and banners

You can turn any of the boxes used into text boxes, which means you can enter text inside the box. If you then apply a change to the box such as rotate, the text inside the box will rotate.

- Use of forward and back to move to the next or previous webpage/slide
- Use of the home button to enable users to return to the homepage.
- Use of menus to provide simple ways for the user to make selections
- Use of hyperlinks to link to other pages/slides
- Bookmarks/Favourites to enable users to go back to a webpage/website they like.

Computers have to be used by everyone, so it makes sense to create software that offers a standard way to move around to enable the user to obtain the information they need. Having standard navigation techniques means that users do not have to learn how to navigate each time they use a different system. Here are some navigation techniques:

Appropriate Use of Standard Navigation Techniques

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## Standard Navigation Techniques

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# Good Practice in Designing Webpages & Slide Presenta

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## Target Audience

The target audience are the people your document is aimed at.

Once you have identified who your audience is, you still need to find out more about them. You must ask yourself questions like:

- What are their needs?
- How much do they already know?
- What is the knowledge of the reader about the subject?
- What level of literacy do they have?
- How much specialist vocabulary can they handle?
- How interested are the likely to in the subject?

The target audience are the people your document is aimed at. You need to make sure that the design of the document is appropriate for the people who will be reading it. The information you have will need to be presented, before you present the information you need to think about who the intended audience is.

movies.

- Images are not as high quality as images without compression
- Sound quality is not as high with compression such as that used with MP3 files
- Compression means it is much faster to transfer movie files and this causes problems with illegally copying

disadvantages

- more files can be stored on the storage medium e.g. DVD, memory card, hard disk etc.
- It is much faster for others to download it from a webpage
- It is much faster to upload to put it on a webpage
- It is faster to load when viewed with any software used to view or edit it.
- It is faster to transfer as an email attachment.

are even bigger than audio files and so need to be compressed. advantages of data compression:

normally saved in MP3 format, which compresses the file and makes the file more manageable. Movie&Video files and to download by users. Audio files such as files containing speech or music are extremely large and these are copy onto other media. If the presentation is to be provided as a download on a website it will be quicker to upload image. Compressing files makes the file size smaller, which makes it quicker to load by the software and also to If images are to be used on a website or a presentation, they can take time to load, so it is best to use compressed

# Data Compression

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## Disability Considerations

When designing websites and presentations you must be aware that users with a range of disabilities will be using the products you produce. You will need to consider people who are visually impaired by:

- having a facility to speak words on the screen
- having a facility to zoom in so that the page is magnified
- increasing the font size
- choosing those font types that are easy to read
- using plenty of contrast between the text and the background
- allowing the user to change the colour scheme

You will need to consider people who have a hearing impairment by:

- using visual warnings rather than sound warnings
- using typed versions of any speech used
- using subtitles for any video used

Someservices, such as chat rooms, message boards, blogs etc. are moderated. This means that a person is appointed to view the material and remove any inappropriate content. Sometimes the services are regulated automatically, which means that the computer will pick out inappropriate words. Some systems may suspend you from the network service for a certain period. In serious cases you could be suspended from the service permanently.

- you do not use swear words
- you do not use racially offensive words
- you do not use words likely to offend certain groups of people
- that your material can be read by people of all ages
- you do not engage in cyberbullying

When you post messages on a blog or message board or use a chat room it is important to realise that this will be viewed by people of all different ages and backgrounds. You therefore need to ensure:

Using inappropriate Language

## Staying Safe Online 2

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# Staying Safe Online

## The Dangers of Disclosing Personal Information

You should never ever give out personal information when you are online. You may be chatting to someone who seems genuine but you could be chatting to anyone. If you reveal your personal information or even worse meet them then you could meet someone who wants to do you harm. There are lots of weird people out there, and they may contact you and you may meet them thinking they are a nice person.

## The Misuse of Images

It is very easy to copy images of a website or social networking site. Images sent to one person can be passed to others without their permission. It is very easy to misuse an image so you need to be very careful where you put your images and what sort of images you send. Here are some ways in which can be misused:

- You may be identified from you image even though there are no other contact details
- You may encounter stalkers or be pestered by email or worse still they may find where you live and you phone numbers
- Your image might be posted on an inappropriate website.
- Your image might be edited using image editing software.
- Paedophiles use school and athletic club websites to obtain images.

If you had young children, you would not want them to have full access to the internet. If they had full access, they could see pornographic images and talk to unknown adults. All internet service providers have parental controls that restrict a child's access to parts of the internet.

## Staying Safe Online 4

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## Staying Safe Online 3

### Codes of Conduct for Personal Protection

- 1) Do not give out personal information such as your address or phone number on a message board, blog, chat room etc.
- 2) Do not use your real name when using chat rooms etc. People may be able to identify you and find where you live.
- 3) Always report abuse or bullying
- 4) Never reveal personal detail in response to an official-looking email.
- 5) Avoid publishing pictures of yourself, as they can be misused.
- 6) Do not open attachments to emails from people you do not know. They may contain inappropriate material.
- 7) Never meet strangers unless you are with an adult you trust.



- Use a firewall to prevent hackers- a firewall is hardware, software or both that works in a network to prevent communication that is not allowed from one network to another. The firewall looks at each packet of data trying to pass from one network to another to see if it is allowed. If it isn't, the network rejects it.
- There are various ways to protect data from deliberate damage:

- Cyber terrorists- it has become known to terrorists that they can cause as much damage as by a bomb by rendering certain sites and data unusable. They hack into the computer systems of large organizations to do this.
  - People who produce and distribute computer viruses- it is illegal to produce and distribute computer viruses but this does not put some people off. Viruses can cause damage to data by altering or even deleting it.
  - Disgruntled employers- these people may have a grievance with the organization and seek to do damage to it by destroying the data.
  - Hackers who want to access your computer and view the data, alter the data or use the data to commit fraud.
- There are a number of different people around who present threats to data such as:

# Viruses

## How to Protect Data from Damage Caused by

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## How to Protect Data from Accidental Destruction

Data can be destroyed accidentally in a number of way such as:

- Equipment malfunction- for example, a hard disk drive might go wrong.
- Equipment destruction- if the computer or computer room is destroyed by fire, earthquake, flood then the data held on the computers, storage devices etc. will be lost.
- User error- it is easy to make mistakes and we have all probably lost work. Training will help users be more aware of what they are doing in order to minimize the likelihood of this happening.

Steps to reduce the likelihood of permanently losing data:

- Train users- users should understand what they are doing. This will reduce the likelihood of them making mistakes such as copying an old file over a new file, deleting the wrong file etc.
- Ensure backup copies are kept- if users do lose data then at least most or all of the data can be recovered from the backup copies kept.
- Thoroughly test software- software should be thoroughly tested before it is used with real data.

Physicals Methods: locks to computer rooms, keyboard locks, biometric access restrictions.

drive is automatically encrypted on that if the computer is stolen or the data copied it cannot be understood.

no sense to the interceptor. Encryption is also a feature of the latest operating systems where the data stored on the hard Encryption scrambles data as it is passed along communication lines or wirelessly so that even if it is intercepted, it makes

Encryption

Passwords are strings of characters kept secret by the user and are used to access the ICT system. The password makes sure that the person who gives the user ID is the person who they say they are. Passwords must be changed on a regular basis and users must remember to log out when they are away from their computer.

to a stand-alone computer.

can allocate resources such as storage area and access to certain files. You can also use a password to prevent access A user ID is a name or number used to identify a user of a network. Once the network knows who is using the network, it

Use of passwords and user-IDs/Username

Here are some ways of protecting stored or transmitted data from authorized access.

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## How to Protect Stored or Transmitted Data from Unauthorised Access

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# How to Protect Data from Damage Caused by Viruses

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- To protect against disgruntled employees destroying data- ensure that you carefully select the staff and if they leave they should not be allowed to work their notice
- Virus Attack- Install virus checking software, do not open file attachments unless you know who they are from, train staff on the problems cause by viruses, do not allow staff to attach portable drives or memory sticks unless they are scanned first and do not allow employees to download games and other unauthorized software onto their computers.
- Virus Scanning software should be kept up-to-date and scans should be scheduled so that they are performed automatically on a regular basis.

- Use an adjustable chair
- Always check the adjustment of the chair to make sure it is suitable for your height. Use a foot support, called footrest if necessary
- Sit up straight on the chair with your feet flat on the floor
- Make sure the screen is lined up and tilted at an appropriate angle

To help prevent back problems:

- Not sitting up straight in your chair
- Using a laptop on your knees for a long period of time
- Working in cramped conditions

The following can cause back ache:

Back Ache

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## Methods of Preventing or Reducing the Risks of Headaches

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## Potential Health Hazards when using Computers

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- Repetitive strain injury (RSI)- this is caused by typing at high speed or using a mouse over a long period of time. RSI is a painful illness that causes swelling of the joints and is similar to arthritis. It can get so bad that many sufferers are unable to use their hands
- Eye strain- looking at the screen all day can give you eye strain. Many people who use computer screens for long periods of time have to wear glasses or contact lenses. The symptoms of eye strain include blurred vision and headaches.
- Back ache- is a painful condition that prevents you from sleeping properly and doing many activities such as playing sport
- Stress- computers can cause situations that are very stressful, such as losing your work, getting a virus, being unable to connect to the internet and so on. All these things tend to go wrong at the worst possible time; for an example, when you have an important piece of work to hand it. Stress is also caused by too much work to complete in to little time. Stress can produce headaches and can affect a person's behaviour towards others. Stress can cause depression and mental illness.

- Have regular eye tests.
- Give your eyes a rest by focusing on distant objects.
- Use blinds to avoid glare
- Use appropriate lighting
- Keep the screen clean, so it is easy to see characters on the screen.

To help avoid eye strain:

- Using the screen for long periods
- Working without the best lighting conditions.
- Glare on the screen
- Dirt on the screen

The following can cause eye strain:

Eye Strain

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# Methods of Preventing or Reducing the Risks of Hea

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# Methods of Preventing or Reducing the Risks of Hea

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Repetitive Strain Injury (RSI)

The following can cause RSI:

- Typing at high speed
- Using a mouse for long periods
- Not adopting correct posture for use of mouse and keyboard
- Not having properly arranged equipment

To prevent RSI:

- Adjust your chair to the correct seating position for you.
- Make sure there is enough space to work comfortably
- Use a document holder
- Use an ergonomic keyboard/mouse
- Use a wrist rest
- Key in with your wrists straight
- Position the mouse so that it can be used keeping the wrist straight
- Learn how to type properly two finger typing has been found to be much worse for RSI

- Have a help-desk to help with user problems
- Train users fully in all the ICT systems they use so they do not get stuck
- Ensure that all software is thoroughly tested so that it does not crash
- Design the software so that it is easy to use
- Ensure that users do not have an unreasonable workload
- Take regular breaks to avoid stress

To help prevent stress:

- The pace of work
- Worry about using the new technology- older people feel they cannot cope
- Software that is frustrating to use because it has not been designed properly
- Losing work, problems with viruses and technical problems.

The following can cause stress:

Stress

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# Methods of Preventing or Reducing the Risks of Hea