Introduction

I intend to carry out my case study using my own knowledge and also gaining research from the internet and books from the library. I have provided some research on communications systems and network systems before I began my tasks. I obtained information about these from the internet and books from the Beauchamp library.

Communication system: an assembly of equipment that allows data to be transferred between two or more places.

Network systems:

Below is a chart to show the speeds of technology and how good the connection speeds are for communication. This information was obtained from

The Chart

Technology	Speed	Wireless	Range	Support	Cost
Ethernet 10/100	100Mbs	A	A	A	A
802.11b	11Mbps	Y	B	A	B
802.11a	52/72 Mbps	Y	C	B	C
Phone Line 2.0	10Mbps	N	A	B	B
Gigabit Ethernet	1000Mbps	N	A	D	D
802.11g	22/54Mbps	Y	C	N/A	N/A
Firewire	400Mbps	N	D	C	A
Blue tooth	1.5Mbps	Y	D	C	C
Homer 2.0	10Mbps	Y	B	C	C
Power Line	14Mbps	N	A	C	C

Chart Explanation - D is poor or inappropriate, A is best
Range: In terms of a home network, will it cover the whole house? A D means short distances; an A means almost any home would be covered without additional equipment.
Support: In terms of industry support for home networking ranging from drivers for different OS's, the availability of bridges and routers, and the support the industry has for using this technology as a home network solution.
Cost: An A is the least expensive. This is the relative cost not just for the network adapters, but the relative cost of hubs, access points, repeaters, or other things needed for a complete home networking solution.

Task 1

1. A comparison of peer-to-peer networks with client server networks.

Peer to Peer Network

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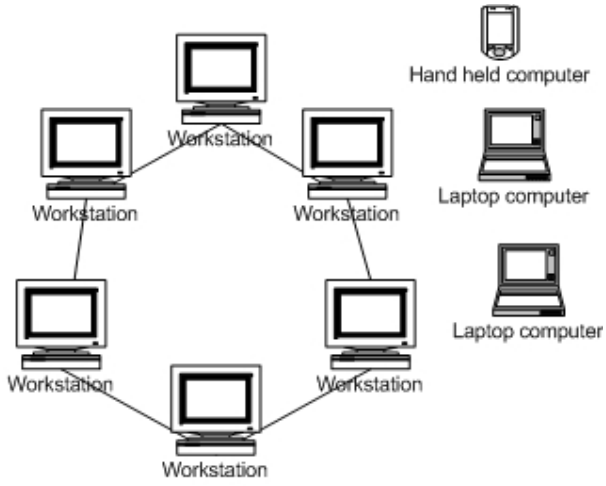
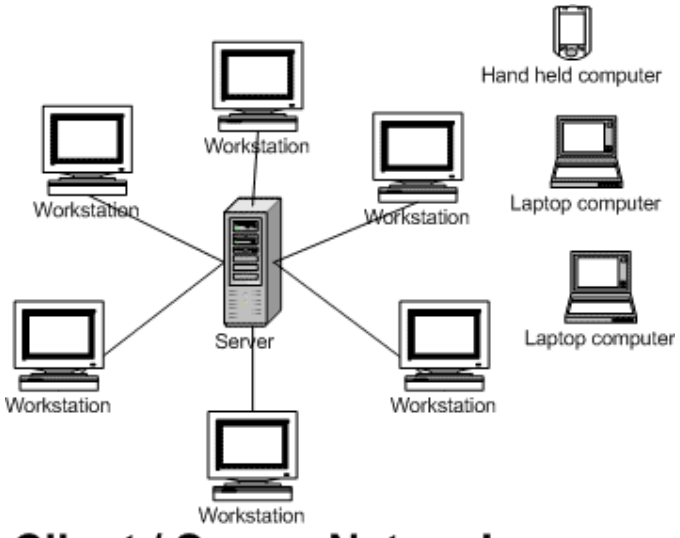
This type of network consists of computers simply connected to each other by Ethernet cables. There is no server, one of the workstations acts as a backup server and there is little upgradeability. This type of network reaches its optimum capacity with 5 workstations. Below is a diagram shown of the p2p network.



Peer to Peer Network

Client Server Network

This type of network consists of computers connected to a central server that acts as a File and Print Server, Backup and Firewall. This is a much more stable network than P2P, but considerably more money to develop and also to maintain. Below is a diagram shown of a Client Server network.



Client / Server Network

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2. Details of the relative advantages and disadvantages of the follo wing topologies:

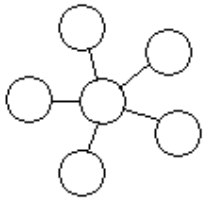
Star - All devices are connected to a central hub. Nodes communicate across the network by passing data through the hub.

Advantages of a Star Topology

- Easy to install and wire.
- No disruptions to the network then connecting or removing devices.
- Easy to detect faults and to remove parts.
- If a cable fails only one user will be affected.
- Fast data transfer as each user has an independent link to the server.

Disadvantages of a Star Topology

- Requires more cable length than a linear topology.
- If the hub or concentrator fails, nodes attached are disabled.
- More expensive than linear bus topologies because of the cost of the concentrators.



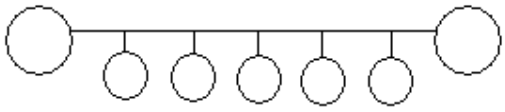
Bus - All devices are connected to a central cable, called the bus or backbone. In a bus topology stations broadcast their messages to all other station. If there is a break in the cable then the entire segment is affected.

Advantages of a Bus Topology

- Easy to connect a computer or peripheral to a linear bus.
- Requires less cable length than a star topology.
- Inexpensive

Disadvantages of a Bus Topology

- Entire network shuts down if there is a break in the main cable.
- Terminators are required at both ends of the backbone cable.
- Difficult to identify the problem if the entire network shuts down.
- Not meant to be used as a stand-alone solution in a large building.
- More users mean that the network is slower



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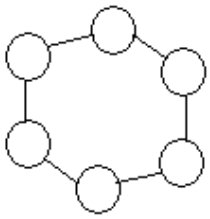
Ring – This topology features a single cable to which all workstations and peripherals are connected. In this respect, ring topology marginally resembles bus topology. The difference is that a ring network's backbone is a closed loop as shown in the diagram below.



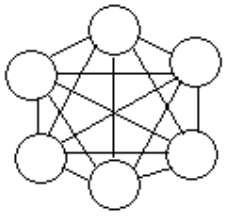
Advantages of a Ring Topology

- Fast data transfer as the data travels in one direction
- Ring networks can be easier to establish
- Ring networks represent low initial overhead (that is, no need to purchase a hub, and each wire only has to connect to the next workstation instead of having all wires come back to the hub).

Disadvantages of a Ring Topology

- Main cable failure affects all computers. Many ring designs incorporate extra cabling that can be switched in if a primary cable fails.
- Because each node must have the capability of functioning as a repeater, the networking devices tend to be more expensive.
- It is difficult to troubleshoot.
- Adding and removing computers disrupts the network.

Mesh - In a mesh topology, each computer on network has redundant data paths. The mesh topology provides fault tolerance-if a wire, hub, switch, or other component fails, data can travel along an alternate path. A diagram of a mesh network looks like a fishing net. A mesh topology is most often used in large backbone networks in which failure of a single switch or router can result in a large portion of the network going down.



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Advantages of a Mesh Topology

- Not dependent upon one link
- More nodes can be added making this an expandable topology.
- Sensor nodes serve as repeaters – no need to specially set up repeaters.

Disadvantages of a Mesh Topology

- Limited bandwidth – each sensor node may be called upon to send data from many different sensors.
- Power issues – Sensor nodes may transmit signals from many adjacent nodes.
- Cost – Software and hardware needed for routing algorithms on each sensor node.

Network Topology:

Topology refers to the shape of a network, or the network's layout. How different nodes in a network are connected to each other and how they communicate is determined by the network's topology. Topologies are either *physical* or *logical*. Below are diagrams of the five most common network topologies.

3. An explanation of the advantages and disadvantages of networking the computers.

ADVANTAGES OF NETWORKING

- Access your files from any computer on the network
- Access one printer and other hardware devices from any computer on the network
- Play multiple-player computer games from different rooms in your home
- Share a high-speed internet connection (cable or DSL)
- Back-up your files on multiple computers
- Scalable: more clients and servers can be added to the system without changing the network significantly
- Easier to manage, administer, and secure than peer-to-peer networks

DISADVANTAGES OF NETWORKING

- If Sever develops a fault then users may not be able to run the application programs.
- A fault in the network can cause user to lose the data.

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- If the network stops operating then it may not be possible to access to various computers.
- It is difficult to make the system secure from hackers, novices or industrial espionage.
- Decisions on resource planning tend to become centralized.
- Networks that have grown with little thought can be inefficient in the long term.
- As traffic increases on a network the performance degrades unless it is designed properly.
- The larger the network becomes difficult to manage.
- If the server fails, all network functions fail
- More complex to set up and maintain than stand-alone computers and peer-to-peer networks, often requiring schools to hire a technician to oversee the network
- Because of the need to have a central "dedicated" server, initial costs are higher

4. A clear diagram, using the diagram supplied (see Fig.1) showing the position of computers, servers, cabling and any connecting equipment required. See attached sheet.

5. Details of the network requirements including the reasons and purpose of the following:

Types of Cable to be used

Cable Type	Advantages	Disadvantages
Optical Fibre	Speed, Electrical isolation, The cable can be long, High transfer rate, Light weight, Upgrading ease	Very expensive, Difficult to install, Breaks easily, Difficult to be mended
CAT5E	It is reliable, easy to install, has decent speeds for the price	Expensive to setup
Coaxial	Easy installation, cheap, cable lengths are greater than CAT5e	Bad contact, Difficult manipulation, Slow for many computers, in general used in linear topology

Category	Type	Spectral B/W	Channel Length	LAN Applications
Cat3	**UTP**	**16 MHz**	**100 meters**	**10Base-T, 4Mbps**
Cat4	**UTP**	**20 MHz**	**100 meters**	**16Mbps**
Cat5	**UTP**	**100MHz**	**100 meters**	**100Base-Tx,ATM,CDDI**
Cat5E	**UTP**	**100MHz**	**100 meters**	**1000Base-T**
Cat6	**UTP**	**250MHz**	**100 meters**	**None available at this time**
Cat7	**ScTP**	**600MHz**	**100 meters**	**None available at this time**

Category 7 cabling advantages

- Higher Bandwidth of up to 600 MHz as compared with Cat 5e (100 MHz) & Cat 6 (250 MHz)
- Suitable for installing in strong RFI & EMI environment
- Individual pair shielding enable better NEXT isolation allowing different application to run in the same cable
- Lower cost than using a fibre LAN
- Moving from existing copper based LAN without having to change the existing electronics.
- Secure transmission shielding keeps signal within cable.

Category 7 cabling disadvantages

- Individual pair and overall shielding increases the overall weight and size of cable. Hence needs larger & stronger pathway and more stringent bend radius (100 mm or 4 inch)
- Individual pair and overall shielding means higher labour cost and longer time to terminate cable.
- Bandwidth of 600 MHz is it truly useful· May have earth loop problems, if both ends of the cable are connected to ground.

Hardware required to build the network

- **Patch panel:** A panel of network ports contained together, usually within a telecommunications closet that connects incoming and outgoing lines of a LAN or other communication, electronic or electrical system. In a LAN, the patch panel connects the network's computers to each other and to the outside lines that enable the LAN to connect to the Internet or another WAN. Connections are made with patch cords. The patch panel allows circuits to be arranged and rearranged by plugging and unplugging the patch cords.
- **File server:** A computer or device on a network that manages network resources. For example, a *file server* is a computer and storage device dedicated to storing files. Any user on the network can store files on the server. A *print server* is a computer that manages one or more printers, and a *network server* is a computer that manages network traffic. A database *server* is a computer system that processes database queries. Servers are often

dedicated, meaning that they perform no other tasks besides their server tasks. On multiprocessing operating systems, however, a single computer can execute several programs at once. A server in this case could refer to the program that is managing resources rather than the entire computer.

- **Mail server:** Often referred to as simply "mail server", an e-mail server is a computer within your network that works as your virtual post office. A mail server usually consists of a storage area where e-mail is stored for local users, a set of user definable rules which determine how the mail server should react to the destination of a specific message, a database of user accounts that the mail server recognizes and will deal with locally, and communications modules which are the components that actually handle the transfer of messages to and from other mail servers and email clients. Generally the person(s) responsible for the maintenance of the e-mail server (editing users, monitoring system activity) are referred to as the postmaster. Most mail servers are designed to operate without any manual intervention during normal operation.
- **Printer server:** If you have a printer to share between multiple computers, you most likely want a printer server. You can share the printer on one computer, but then you need to have that computer turned on even when you just want to print a document from another computer.
- **NIC (Network Interface Card):** The purpose of a Network Interface Card (NIC) is to provide your computer with a physical connection to a network. Almost all new computers come with a pre-installed NIC
- **Hub:** A common connection point for devices in a network. Hubs are commonly used to connect segments of a LAN. A hub contains multiple ports. When a packet arrives at one port, it is copied to the other ports so that all segments of the LAN can see all packets. A *passive hub* serves simply as a conduit for the data, enabling it to go from one device (or segment) to another. So-called *intelligent hubs* include additional features that enable an administrator to monitor the traffic passing through the hub and to configure each port in the hub. Intelligent hubs are also called *manageable hubs.*
- **Switch:** In networks, a device that filters and forwards packets between LAN segments. Switches operate at the data link layer (layer 2) and sometimes the network layer (layer 3) of the OSI Reference Model and therefore support any packet protocol. LANs that use switches to join segments are called *switched LANs* or, in the case of Ethernet networks, *switched Ethernet LANs.*
- **Bridge**: receives the entire message into memory. If the message was damaged by a collision or noise, it is discarded. If the bridge knows that the message was being sent between two stations on the same cable, it discards it. Otherwise, the message is queued up and will be retransmitted on another network cable. The bridge has no address. Its actions are transparent to the client and server workstations.
- **Router:** acts as an agent to receive and forward messages. The router has an address and is know to the client or server machines. Typically, machines directly send messages to each other when they are on the same cable, and they send the router messages addressed to another zone, department, or sub-network.
- **Firewall:** A system designed to prevent unauthorized access to or from a private network. Firewalls can be implemented in both hardware and software,

or a combination of both. Firewalls are frequently used to prevent unauthorized Internet users from accessing private networks connected to the Internet, especially *intranets*. All messages entering or leaving the intranet pass through the firewall, which examines each message and blocks those that do not meet the specified security criteria.

- **RJ45 connectors:** an eight-wire connector used commonly to connect computers onto local-area networks (LAN), especially Ethernets.
- **UTP cables (accept specification of cables e.g. CAT5): u**nshielded **t**wisted **p**air, a popular type of cable that consists of two unshielded wires twisted around each other. Due to its low cost, UTP cabling is used extensively for local-area networks (LANs) and telephone connections. UTP cabling does not offer as high bandwidth or as good protection from interference as coaxial or fibre optic cables, but it is less expensive and easier to work with.
- **UPS (Uninterrupted Power Supply):** a power supply that includes a battery to maintain power in the event of a power outage. Typically, a UPS keeps a computer running for several minutes after a power outage, enabling you to save data that is in RAM and shut down the computer gracefully. Many UPS's now offer a software component that enables you to automate backup and shut down procedures in case there's a power failure while you're away from the computer.
- **Repeater:** receives and then immediately retransmits each bit. It has no memory and does not depend on any particular protocol. It duplicates everything, including the collisions between data streams.
- **Patch Leads:** A cord resembling that of a telephone wire but thicker with slightly larger connectors, that physically connects the computer to the network. Patch cables come in many colours but are usually gray or yellow.

A comparison between different network components

Media	**Maximum Segment Length**	**Speed**	**Comparative Cost**	**Advantages**	**Disadvantages**
UTP (unshielded twisted pair)	100 metres	10Mbps/100 Mbps	Least Expensive	Easy to install, widely available, widely used.	Susceptible to interference; can cover only a limited distance
STP (shielded twisted pair)	100 metres	10Mbps/100 Mbps	More expensive than UTP	Reduced crosstalk, less susceptible to EMI than UTP	Difficult to work with; can cover only a limited distance
Coaxial	500/185 metres	10Mbps/100 Mbps	Relatively inexpensive, but more costly than UTP	Less susceptible to EMI than other types of copper media	Difficult to work with; limited bandwidth; limited application;

					damage to cable can bring down entire network
Fibre optic	3km and further (single node) 2km and further (multimode)	10Mbps/1000Mbps (single node) 100Mbps/9.92Gbps (multi mode)	Expensive	Cannot be tapped easily, so security is better; can be used over great distances; not susceptible to EMI; higher data rate than coaxial and twisted-pair	Difficult to terminate Susceptible to atmospheric conditions

Any additional Software required

- Microsoft XP
- Novell client (this is used at Beauchamp College)

Different types of protocols

Protocols - is a standardized means of communication among machines across a network. Protocols allow data to be taken apart for faster transmission, transmitted, and then reassembled at the destination in the correct order. The protocol used determines the way errors are checked, the type of compression, the way the sender indicates the end of the transmission, and the way the receiver indicates that the message has been received. Protocols can describe low-level details of machine-to-machine interfaces (e.g., the order in which bits and bytes are sent across a wire) or high-level exchanges between allocation programs (e.g., the way in which two programs transfer a file across the Internet).

Netbeui - is an enhanced version of the NetBIOS protocol that is used by Microsoft Windows networking. It is a non-routable protocol, which means that computers that are not located on the same network segment or subnet can't communicate.

Token Ring - A type of computer network in which all the computers are arranged (schematically) in a circle. A *token*, which is a special bit pattern, travels around the circle. To send a message, a computer catches the token, attaches a message to it, and then lets it continue to travel around the network.

IPX - Short for ***I****nternetwork* ***P****acket* ***Ex****change,* a networking protocol used by the Novell NetWare operating systems. Like UDP/IP, IPX is a datagram protocol used for connectionless communications. Higher-level protocols, such as SPX and NCP, are used for additional error recovery services.

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Fast Ethernet - A networking standard that supports data transfer rates up to 100 Mbps (100 megabits per second). 100BASE-T is based on the older Ethernet standard. Because it is 10 times faster than Ethernet, it is often referred to as *Fast Ethernet.*

Like Ethernet, 100BASE-T is based on the CSMA/CD LAN access method. There are several different cabling schemes that can be used with 100BASE-T, including:

- **100BASE-TX:** two pairs of high-quality twisted-pair wires
- **100BASE-T4:** four pairs of normal-quality twisted-pair wires
- **100BASE-FX:** fibre optic cables

TCP/IP - ***T****ransmission* ***C****ontrol* ***P****rotocol/****I****nternet* ***P****rotocol,* the suite of communications protocols used to connect hosts on the Internet. TCP/IP uses several protocols, the two main ones being TCP and IP. TCP/IP is built into the UNIX operating system and is used by the Internet, making it the de facto standard for transmitting data over networks. Even network operating systems that have their own protocols, such as Netware, also support TCP/IP

SPX - ***S****equenced* ***P****acket* ***Ex****change,* a transport layer protocol (layer 4 of the OSI Model) used in Novell Netware networks. The SPX layer sits on top of the IPX layer (layer 3) and provides connection-oriented services between two nodes on the network. SPX is used primarily by client/server applications.
Whereas the IPX protocol is similar to IP, SPX is similar to TCP. Together, therefore, IPX/SPX provides connection services similar to TCP/IP.

Different types of Connector

Connector Name	Used for	Description
BNC	Coaxial cable	There are many different types of adapter which can be used for the BNC connector these include a barrel connector, terminator and a T-connector.
ST connector	Fibre optic cable	It is similar to the BNC as it is as well barrel shaped. The connector is easy to connect in a small space as it has a square face.
RJ45 connector	CAT5E cable	This connector looks like a standard telephone socket. The connector can only be inserted in one way into the slot.

Task 2

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Changing from standalone to networked computers will add new functionality to the system. There will however be an increased risk from hackers and viruses. Write a memo to the Managing Director detailing how hackers and viruses could get into the network and what must be done to protect the network from such intrusions. See attached sheet.

Task 3

The Managing Director wants to connect the new network to the Internet. Produce notes for the Managing Director.

The notes need to cover:

A description of services that the Internet can provide for the company and its employees

E-mail: Standard {hacker} terminology for electronic mail, i.e., messages that are sent by computer network. (Compare {snail mail}.) Email is a much appreciated and indispensable tool of persons whose work attaches them to the Internet, especially computer professionals. Email can be dealt with according to the receiver's own schedule. That could mean immediately, resulting in turnaround times of just a minute or so. But it allows the receiver to prioritize messages. In comparison the telephone is a rude device that interrupts you and demands immediate attention, no matter what you are doing. Another advantage is that when email is saved, it leaves a written record of exchanges that can be built into a substantial information database. That I often receive and send over 200 email messages a day, but only two or three phone calls, usually from my wife, is strong evidence that busy computer workers greatly prefer email to the telephone for most lower priority communications
Conferencing: Any number of web-based discussion groups can be created in WebCT. Contributions can be listed either threaded by subject, or ordered by time of posting. URLs typed into the body of a message are seen by readers as links which, when clicked, cause the destination to be viewed in a separate window. The conferencing system does have some features that make it particularly useful in an educational setting. For example, message readings, follow-ups and original contributions are tracked and recorded for each student. This may be useful for courses where discussion forms part of the evaluation.

WWW: (World Wide Web) Also called WWW, W3, or just the Web, the World Wide Web is the whole gamut of hypertext servers that let HTML programmers present virtual, on-screen pages combining text, graphics, audio, and other file types -- not to mention links to other pages. Users point and click to access World Wide Web pages using browser software, such as Netscape Navigator, which provides the front-end once the Internet connection is actually established.

Public Domain Software: Any non-copyrighted program; this software is free and can be used without restriction. Often confused with "freeware" (free software that is copyrighted by the author).

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File Attachments: This would be useful as people working at the Swan could attach files in their emails using the web browser and sending it to one another across the server.

E-commerce: E-commerce (or electronic commerce) is any business transaction whose price or essential terms were negotiated over an online system such as an Internet, Extranet, Electronic Data Interchange network, or electronic mail system. It does not include transactions negotiated via facsimile machine or switched telephone network, or payments made online for transactions whose terms were negotiated offline.

Bulleting Boards: Usually a computer with a hard disk that can be accessed with a modem. Software and programs can be uploaded (left on the Bulletin Board) by a caller, or a caller can download any software (transfer to their computer). Bulletin Boards also often have help and messaging services. Byte A unit of measurement for memory and hard disk space. One Byte (usually) contains 8 bits. Also, Kilobyte (K or Kb), Megabyte (Meg or Mb) and Gigabyte (Gig or GB). 1 Byte - 8 Bits

Discussion Forums: Discussion forums are online tools that capture the exchange of messages over time, sometimes over a period of days, weeks, or even months. Threaded discussion forums are organized into categories so that the exchange of messages and responses are grouped together and are easy to find.

Advertising: has three basic objectives: (1) to inform the consumer about new products, product users, services available, or other facts that need to be known by consumers; (2) to persuade an audience to purchase a product, change brand preferences, or perceive a product different; and (3) to remind consumers about the need for need for a product or where it may be purchased

A description of the different types of software required to:

Connect to the Internet

1. Browser: handles the display of the data that the modem or network connection brings to your computer. Netscape and Internet Explorer are the most popular browsers and are both free now, but there are many other good browsers out there. Older browsers may be text only. An online service may provide its subscribers with a browser with a special interface.

2. Email: handles the creating, sending, receiving, and storing of email messages.

3. Other useful software:
    a. FTP program- for file transfers
    b. IRC (chat) or instant messaging program- for discussions and general conversation using text.
    c. Newsgroup program - for exchanging messages about a particular topic, like Windows installation problems.
    d. HTML editor - Writing your own web pages can be done with just a text editor like Notepad, but it's easier with an HTML editor.

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FrontPage Express is a WYSIWYG (sort of) editor and can get you started, but it is quite limited. Microsoft FrontPage is a more advanced editor.

If you install the complete set of programs that come with Internet Explorer 4 or 5, or the programs that are available as additions, you will have IE as your browser, Outlook Express for both email and newsgroups, Microsoft Chat for IRC chatting, and FrontPage Express for creating web pages (depending on which version of IE you install). If you install Netscape or Netscape Communicator 4, you will also have software that performs all these important functions. Neither Internet Explorer nor Netscape have an FTP program. Both sets of programs do their jobs. Each has certain advantages over the other. If you don't like either of these suites of programs, there are many other programs available from other companies.

View pages on the Internet

Some of the ideal software needed to view some pages: -

- Adobe Acrobat Reader 7.0 - Adobe® Reader® 7.0 is free software that enables business professionals and home users to reliably share information using intelligent PDF files. With Adobe Reader 7.0, you can easily view, print, and search PDF files using a variety of platforms and devices.

With a growing list of rich features, this new version of familiar Adobe Reader software:

Provides better overall performance for faster launch times and real-time zooming and panning. Enables you to fill out and submit PDF forms from a variety of devices. Helps you download and organize digital editions on a variety of devices, with full support for portrait or landscape viewing. Lets you display and share Adobe Photoshop Album slide shows and electronic cards, and export images for online photo processing.

Allows you to save a range of files attached to PDF documents, such as word processing documents, spreadsheets, and multimedia files, and open them in their native applications

- FreeZip/Winzip 9.0 – The most popular compression utility for Windows, with more than 130 million downloads. Quickly and easily zip and unzip files and folders. Save storage space, dramatically reduce e-mail transmission time, and efficiently archive documents. Easy-to-use AES encryption to protect your sensitive data. Flexible user interface: the intuitive WinZip Wizard for first-time users and the award-winning WinZip Classic interface for power users.

- Power Point Viewer- Microsoft PowerPoint Viewer is a piece of software that enables people who do not use PowerPoint to view and print PowerPoint Presentations exactly as they appear in PowerPoint, but it does not allow them to edit presentations. You can use this viewer to view files created in both PowerPoint for Windows® and PowerPoint for the Macintosh.

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- Netscape Communicator - Netscape Navigator is a network navigator that allows retrieval and viewing of World Wide Web multimedia documents. It is compatible with NCSA Mosaic and is designed to provide the next generation of performance and ease-of-use.
- Quick Time - At its simplest, QuickTime is software that allows Mac and Windows users to play back audio and video on their computers. But taking a deeper look, QuickTime is many things: a file format, an environment for media authoring, and a suite of applications:

QuickTime Player - for playing back audio and video files
QuickTime Pro - for flexible multimedia authoring
Browser plug-ins - for viewing media within a web page
PictureViewer - for working with still images (Windows only; Preview is available on Mac OS X)
QuickTime Streaming Server - for delivering streaming media files on the Internet in real time
Darwin Streaming Server - for delivering streaming media with Linux, Solaris, and Windows.
QuickTime Broadcaster - for delivering live events on the Internet
MPEG-2 Playback Component - for playing back MPEG-2 content.

Assist with the use of the Internet – utility programs

- WinZip
- PKZip
- CuteZip
- Stuffit Deluxe
- ZipIt
- Mozilla Firefox 1.0

Communicate on the Internet

If you have got broadband internet connection then you need the broadband installation CD. If you have got dial up internet connection then you need your ISP setup CD. Without the installation CD's for both broadband and dial up you will not be able to connect to the internet.

Other types of software needed to communicate with others on the internet are messaging clients such as:-

- ❖ Msn Messenger
- ❖ Yahoo Messenger
- ❖ AOL Instant Messenger
- ❖ ICQ Messenger
- **An explanation of the costs associated with using the Internet and a cost comparison of different methods of connection**

Dial up and broadband are the two types of connection for internet. The connection I would recommend for The Swan to use would be broadband. My explanation of the costs associated are as shown below.

How Does a Dial-Up Connection Work?

A Dial-Up Connection is a connection to the internet (or other remote computer or network) made by dialling up an access connection number.

Simply put, Dial-Up Internet Access is a cheap and easy way of accessing the internet whenever you want to. When using a dial-up connection you are not 'always on' the internet. When you want to access the internet you must have your telephone line plugged in to the modem port on your computer, then your computer accesses the internet through your telephone line to allow you to surf the net or check your emails.

There are no download restrictions with your dial-up connection and to close the connection all you do is hang up. This cost-effective way of surfing the internet means that you only ever pay for what you use (unlike other types of connection that are always on - even when you're not using them). Connection speeds of up to 56 Kbps will allow you to enjoy what the World Wide Web has to offer.

One time costs:

It requires very little expenditure as almost everyone already has a phone line. Also, almost every PC sold in the last five years came with a modem built in.

Ongoing costs:

There are several options available. The most basic is to set up a 'free' account and pay for the phone call costs. This works out to be very expensive if you are more than an occasional user. With the advent of flat rate, you can sign up with a provider to pay a flat monthly fee for a set number of hours access. There are several options available.

Advantages:

- Inexpensive to set up. Very little capital cost is involved if you already have a phone line.
- It is available almost everywhere.
- If you own a portable device like a laptop or PocketPC, you can use this method of connection on the move.

Disadvantages:

- It can be very expensive to use. During peak times (from 8am to 6pm Monday to Friday) it costs approximately 5p per minute to connect. You should sign up for a flat rate package if this is a concern.
- It is slow to use. More and more web sites are using flash animation and other attractive programming to increase the appeal of the site. This adds to the time it takes for the site to appear. Using dialup, it isn't uncommon to wait 15 to 30 seconds for the next page to load.
- Dialling up to the provider can take a minute or longer depending on the equipment. This becomes an irritation if one connects to the internet frequently.

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- Most residential users only have one phone line. It is not available while connected to the internet using the dialup method.
- Depending on the provider, you may get a busy signal at peak times during the day as all the modems at the provider's side are in use.

How Does a Broadband Connection Work?

A Broadband connection is a connection to the internet which is much faster than Dial-Up Connection. You are always connected to the internet and you always have the same IP address. This is convenient as you do not have to dial a number all the time as supposed to Dial Up. Broadband enables both telephone calls and your Internet connection to operate on the same phone line simultaneously. This is achieved by plugging a filter (sometimes known as a splitter) into all phone sockets that are to be used, allowing voice and Internet at the same time. A filter separates the telephone signal from the broadband signal, therefore allowing telephone and Internet connection at the same time. As part of your broadband package you will receive the broadband modem and data cable. Many of the broadband suppliers also offer at least one filter free of charge when you sign up with them, but if they don't you can buy them from places like www.ebuyer.co.uk for approximately £2 each.

- Connection fee -
  This is the cost of setting you up with broadband. The cost varies greatly with some suppliers connecting you free of charge and some charging up to £100.
- Modem -
  Some broadband suppliers offer a free modem whilst some charge from £20 to £100. Make sure you check to see if filters are included in the price too.
- Monthly fee -
  This is your subscription fee that you will have to pay every month. It includes all of your Internet calls.

The only other thing to be aware of is that some broadband suppliers may charge you a delivery fee for the modem.

You also need to be aware of what the minimum contract is when you sign up. Many suppliers only work on a minimum 12-month contract but as the market gets more competitive some companies are beginning to offer 1-month minimum contracts.

- **A description of domains and subdomains, the advantages of each and how they might be used by The Swan.**

A domain is a specific virtual area within the Internet, defined by the "top level" of the address or URL (Uniform Resource Locator). The top level is the end of the address; example: "whitehouse.gov". In this example, the top-level part of the domain is ".gov", indicating a US government entity. The "whitehouse" part is the second-level domain, indicating where within the ".gov" domain the information in question is to be found. Other common top-level domains include ".com", ".net", ".uk", etc.

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ADVANTAGES

Easy to find:
A URL with your name or the name of your company is easier to find or even can be guessed correctly by your prospective visitors.

Easy to remember:
Once your customers have found your Web site, it's much more likely that they will remember a short URL than one that reads http://www.somehost.com/members/you/index.html.

Independence:
You can switch to another Web space provider and take your URL with you. Without your own domain name you would have to

- resubmit your pages to the search engines and directories
- find out who links to your site and inform them of your new address (hoping that they all change the links)
- Eventually keep paying your previous hosting site for a while to redirect the visitors of your old pages to your new location.

Credibility:
A lot of Internet users tend to trust a company with their own domain a lot more than one without. However, for others this is not relevant. What do you think of companies that can't afford their own domain name or are hosted on a free server? Serious businesses need to have their own domain name.

Easy to type:
A short URL is easier to type in the browsers address field. It's also easier to add it to your SIG file or to write it on your business cards and print it on your business letters.

Protection:
Once you've registered your domain name, no one else can take your name and register it. You could use a Domain Name Query site to find out if your desired domain name is still available.

Affordable:
The registration of a .com domain cost less than £5 for one year nowadays.

- More advantages
  - You can have your own access-logs on your server and analyse them easier and faster.
  - You can receive email at your domain name and have your own email addresses, like *you@yourdomain.com* or *sales@yourdomain.com*.

A sub domain is an extension of your own domain, which can be mapped or pointed to a particular directory inside of your hosting account. For example, if your domain was yoursite.com:
Forum.yoursite.com could point to yoursite.com/forum (this can be also accessed as www.forum.yoursite.com).

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Domain? Sub Domain? Which one would I choose if I was working at 'The Swan'?

Having your own domain portrays a more professional image. When you register a domain name, you own it as long as you keep paying the name registration fees. If you decide to change web hosts, your name goes with you and your customers can still find you. A sub-domain is obviously cheaper and there are no name registration fees. Your web site is just as easily available as if you had your own domain. The sub-domain is a good solution for small businesses such as 'The Swan' that aren't sure if they need a domain or can't afford one. You can move up your own domain at any time.

Task 4

The change from standalone to networked computers brings about a possible increased use of computers. This in turn brings about an increase in the health and safety risks.

Write a memo to the Managing Director detailing the health and safety risks associated with computer use.

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