

Hardware & Software

User Requirements

Burgers away is a new chain of fast food, takeaway and drive-through outlets in the UK. Asmin Tariq is the Managing Director of Burgers Away. The head office is in Northton and has six main departments.

A new branch is due to open on February 14th in Westchester. Sarah Wright has been appointed the new branch manager. Sarah will have a desktop computer that she will use to perform the following tasks:

- Recording weekly sales figures
- Producing leaflets and flyers for local promotions
- Recording staff hours
- Producing letters
- Keeping staff records, including photographs
- Ordering supplies locally, e.g. salad items.

In the new Westchester branch there is a computer terminal at each sales point (two inside the branch and one for the drive-through). Sarah's computer is linked to the three sales point terminals by means of LAN and to Head Office by means of WAN.

I have a maximum of £2000 to spend on the complete system and any additional hardware and software.

Hardware And Software

For Sarah's new computer system she will need the following:

Inputs

Input devices Input devices enable the user to enter data, commands and programmes into the computers central processing unit (CPU) – its brain. There are many such input devices, but some of the most common ones are:

- Keyboard
- Mouse
- Rollerball
- Scanner

- Digital camera
- Microphone
- Joystick.

Keyboard

The keyboard is the most commonly used input device and is used to key in data or to enter commands to the computer. The great majority of keyboards follow the standard IBM layout and design. Touching or pressing a key sends an electrical signal to the computer which interprets it as a character or function.

The keyboard is divided into four main areas:

- Function keys across the top
- Letter keys in the main section
- A numeric keypad on the right
- Cursor movement and editing keys between the main section and the numeric keypad.

A computer keyboard is almost the same as a typewriter, apart from a few extra keys and specialised functions. The standard layout for most typewriters and keyboards is called the QWERTY layout. The name comes from the first six keys on the top row of the alphabetic characters. A keyboard will be essential for Sarah as it is a key instrument for entering data into the computer, such as sales figures, and I believe that she will only need a standard design.

Mouse

A mouse is a pointing device that enables the user to control the movement and position of the on-screen cursor by moving the mouse around on a surface such as a desk. To select items (such as words or icons) the user positions the mouse pointer and presses one of the mouse buttons. This produces a 'mouse click'. Other such mouse movements are known as; 'double click', 'click and drag, and 'drag and drop'. All of which refer to actions performed by the mouse. Although the keyboard can still be used for most commands, the mouse makes it a lot easier and quicker.

The standard mouse comprises casing, buttons and base. The casing is designed to be held by the fingers and thumb of one hand, with the bottom of your palm resting on a mat, or other surface. The top has one, two or three buttons, each clicked for different functions. The bottom is flat and has a 'multidirectional detection device' usually a rubber ball.

As technology has advanced, so has the mouse. From its original design, many others have evolved. Some are programmable, some are ergonomically designed to fit the hand and most now have a wheel button on top to make scrolling and zooming easier.

The rubber ball in the mouse needs to be cleaned often to stop it from getting filled with dirt, causing it to become sticky. This problem however can now be overcome, with the introduction of the mouse with an optical sensor instead of a ball. A tiny digital camera takes up to 1,500 pictures per second of the surface beneath the mouse, and these are then translated into the movement of the cursor on the screen. Thus meaning that you would no longer need a mouse mat as the sensor works on any non-reflective surface.

The cordless mouse relies on digital radio technology to send signals to a digital receiver. The use of radio waves means that the mouse can be used up to 9m away regardless of any obstacles that might be in the way. It will be of great use to Sarah, and I would give her an optical mouse, as this way she will not have to clean it out.

Scanner

Scanners translate the pattern of light from words, symbols or other graphics into a digital signal, which is sent to the computer, where it can be stored or manipulated.

The most popular type of scanner is the flatbed scanner, which works in a similar way to a photocopier. The chosen document is placed down on a flat piece of glass, and the lid is closed. A sensor then moves along the underneath of the glass, reading the information.

Another type of scanner is the handheld scanner, which is not in use today as much as it used to be due to the fact that it can only cope with small areas, and is not very accurate. They are used by simply rolling the handheld device along the top of the document.

Sheet-feed scanners are very popular in offices as they can cope with a stack of paper, and are about five times faster than an ordinary flatbed scanner. A flatbed scanner would be most useful for Sarah, as she can use it to scan in documents, and graphics which she may need to produce posters or flyers.

Digital camera

A digital camera is very similar to a traditional camera, but instead of recording the image onto film, it's converted into a digital form, which can be saved as a file on a disk. You usually see the photo straight after it has been taken with the aid of a small screen on the back of the camera, and if you don't like it, you can simply delete and take another. With a digital camera there is no need to go and get the film developed, as it can be loaded onto a computer screen. From there the photo can be manipulated and edited, and when printed on special photographic paper, the results are no different to that of a processed photograph.

Digital video cameras work in a similar way, with DVD technology, and in the future are likely to provide a much cheaper and clearer alternative to making feature films in the future. This would also be very useful for Sarah as she could take photos of her establishment and then use them for advertising.

Main processing unit

The main processing unit is housed in a case and may come in the form of a tower, a mini-tower or a desktop. Nowadays every computer comprises of the following essential components:

- Central processing unit (CPU)
- Memory
- Motherboard
- Ports
- Disk drives
- CD-ROM drive.

It may also have some additional components:

- Modem

- Network drive.

Central processing unit (CPU)

The central processing unit (CPU) – or microprocessor – is the computers brain. It can interpret and carry out the commands that the user gives to the computer through the input devices. It can gather, decode, execute instructions, and transfer data from one component to another.

A microprocessor is a chip of silicon composed of tiny electrical switches. These chips are usually around 0.5cm long and 0.05cm thick. The speed at which the processor carries out its operations is measured in millions of cycles or pulses per second – megahertz (MHz). This is essential to Sarah as no computer can run without it, and she would need a speed of 2.5GHz.

Memory

Memory is the name is the name given to the chips inside the processing unit where the data and instructions are stored for fast access. Memory is used to store the programs you use and is the working area that processes the current data. It comprises of ROM (Read-Only Memory) and RAM (Random Access Memory).

ROM is a permanent memory that is available whether the computer is switched on or off.

RAM is the computers temporary working memory where programs and data are stored when the computer is running. Windows xp requires at least 128 MB of RAM to run efficiently, and more powerful machines may have 512MB or more. So I would choose 512MB for Sarah, as any lower would be outdated to quickly.

Motherboard

The motherboard is the main printed circuit board of the computer, which usually forms the ‘floor’ of the system. All the other electrical components are plugged into the motherboard (e.g. CPU and memory). These components are linked by busses, which are etched into the motherboard and carry signals from one component to another.

Ports

Ports are the sockets on the back of the main casing, which you can use to connect peripheral devices, such as printers, scanners, mouse, etc. There are two types of ports, named serial and parallel which is the faster of the two. A small socket usually labelled USB is a fast new alternative way to connect to modern devices, such as USB Scanners, USB Joysticks, USB Modems etc.

Modem

A modem is a device used for sending and receiving information through telephone signals. It allows connection to other computers, and is often used at home to connect to the Internet. This is something Sarah will need in order to connect to the internet, check her e-mail, and connect to her WAN.

Network Card

A network card is a device which allows a standalone PC to connect to a network. This is essential to Sarah, as she will need one to send and receive data to the sales terminals.

Storage Device

Any device which holds information is called a storage device. Most modern computers will contain the following:

- Hard Drive
- Floppy Drive
- CD-ROM Drive

The Hard Drive

Electronic signals are converted into codes of magnetic patterns on a magnetic surface which can later be converted back if needed. Very useful for storing large amounts of data within a computer. Many computers now have a hard drive with at least 10 gigabytes storage space. One danger is that they can become faulty leading to enormous potential data loss! For Sarah I believe that she would need a hard drive with a capacity of 40GB.

The Floppy Drive

Electronic signals are converted into codes of magnetic patterns in a similar way used by the hard drive. It can be very useful for storing small amounts of data and transferring small amounts of data to another computer. Usually only 1.44 MB of data can be stored on each disk. Sarah will most defiantly need a floppy drive, as they can come in very useful for transferring information.

The CD-ROM Drive & The DVD-ROM Drive

Electronic signals are stored permanently on a surface in a form which can be collected optically, by the computer, using a laser. They are very reliable and can hold large quantities of data. Disks can be removed easily to be used in different computers, but cannot be used to store data without the use of a CD Writer Device.

A DVD-ROM disc is the same size as a CD-ROM disc, yet it holds nearly 10 times the amount of data. Has very good quality multimedia e.g. films can be watched using this medium on a computer. Can also be used to store large amounts of data wit the introduction of a DVD Writer Device. Sarah will need a DVD-ROM which she can use to load software and documents/graphics. She would also need a CD Writer which a are now very cheap, and she can use to save large amounts of data onto CD.

Output Devices

An output device lets you see or hear the results of a computers operation. For example, when you enter text through a keyboard you can read it on the monitor. These devices include:

- VDU (Monitor)
- Printers
- Speakers

VDU (Visual Display Unit) or Monitor

A monitor display is made up of tiny dots called pixels. These pixels react to the electronic signals received from the main processing unit, which produces an image. This is very useful for users to work interactively with a computer and for displaying information as it changes, and as the

images change previous screen images are lost. For Sarah I would recommend a monitor size of 17”.

Printers

Electronic signals sent by the main processing unit are received by this device and converted into images/text produced on paper, fabric, stickers, etc. They are very useful for providing a permanent record for future reference. The quality of the output depends upon the resolution of the printer (dots per inch). Different types of printer work in different ways:

A dot-matrix printer has a print head, which is a matrix of fine needles (there are typically 9, 18 or 24 of them), and they make a particular character by firing some of the needles at the ribbon, which in turn makes the outline of the required character as a series of dots on the paper.

Because the needles impact against a ribbon, which physically strikes the paper, this type of printer is very useful for printing forms which have carbon paper duplicates e.g. Payroll slips.

An inkjet printer creates characters by squirting very small jets of fast drying ink at the paper. The result is extremely high quality at low cost.

A variant on the inkjet theme is a bubble-jet printer which uses a different technology to get the ink onto the paper.

Laser printers are like photocopiers but they get their original data from a computer rather than from paper. Like photocopiers, they are expensive to buy and run but are fast, relatively quiet and can produce very high-quality text and graphics output. There are new technologies that give the same high quality output as laser printers but which are cheaper as they do not use laser technology. For Sarah I would recommend a colour inkjet printer, as they are very low-cost, but will give high quality images on flyers.

Speakers

Electronic signals sent by the main processing unit are received by this device and converted into sounds which the user can hear. Quality of sound heard is dependent upon the quality of the speaker. The sound, once heard, fades away and is therefore not in itself a permanent record for future reference. In some cases computer software can convert text into spoken words. This is very useful for people with a reading difficulty. I would recommend a simple speaker set, as Sarah may want

to listen to music while she is working and certain internet sites contain useful audio information.