Module 5 Information: Policy, Strategy, and Systems

Topic 1 - Policy, Strategy, and Back-ups

In the exam you are expected to:

- *Understand the need for an information technology policy.*
- *Understand the strategic implications of software, hardware and configuration choices for an organisation.*
- *Appreciate the range of needs of different users.*

Methods of enhancing existing capabilities and Future proofing

- *Discuss the reasons why organisations may wish to upgrade hardware/software provision. Factors could include hardware/software development, organisation ethos, task driven change, software change.*
- *Understand that hardware and software exists which allow packages to run on different platforms, and the advantages and disadvantages of these approaches.*

Backup strategies

- *Describe the different options available for backup systems and understand the implications and limitations of use.*
- *Understand the strategies for backup scheduling and storage of backups.*

All successful businesses have a **business plan**. It is important that the **information strategy** is connected to the business plan, but this does not always happen. Information is a shared resource. In companies where there is joined-up thinking, it is available to all and is central to the implementation of the business plan. There are different areas in which strategic planning is related to information systems.

1. Consistency with Business Priorities

Many businesses have **critical success factors**, which are certain things that have to be achieved to enable the managers to say that the business is a success. These might include:

- Customer service is excellent;
- Products are of high quality;
- Customers return for more;
- Customers come to our company in preference to a rival.

Question 1 What critical success factors might there be for your college?

Question 2 How might information systems be used to assess critical success factors?

2. Centralisation or Decentralisation

In many companies computing services (which include information systems) are a separate department, which looks after all the issues to do with computing, such as processing, maintenance of hardware and software. Where this is the case, we say that the information systems are **centralised**.

Some companies operate a **distributed** system where the information systems tasks are done by individual departments, possibly with a back up from a small computing department.

Question 3 What do you think is the advantage and disadvantage of a centralised computing services department when compared to a distributed system?

3. Different User Needs

Computer programmers and systems analysts use computers because computers are there. In most companies the users are end-users, which means that they use computers because computers help them in their jobs. In Module 4 we saw that there are three main categories of information systems which have different kinds of end user:

- **Transaction processing systems** in which the users are: clerical workers, sales staff, customers, and data entry clerks.
- **Knowledge work systems** used by professionals, middle managers, and accountants.
- **Management support systems** used by senior managers to make strategic decisions

Question 4 What levels of decision making can be made with these different systems?

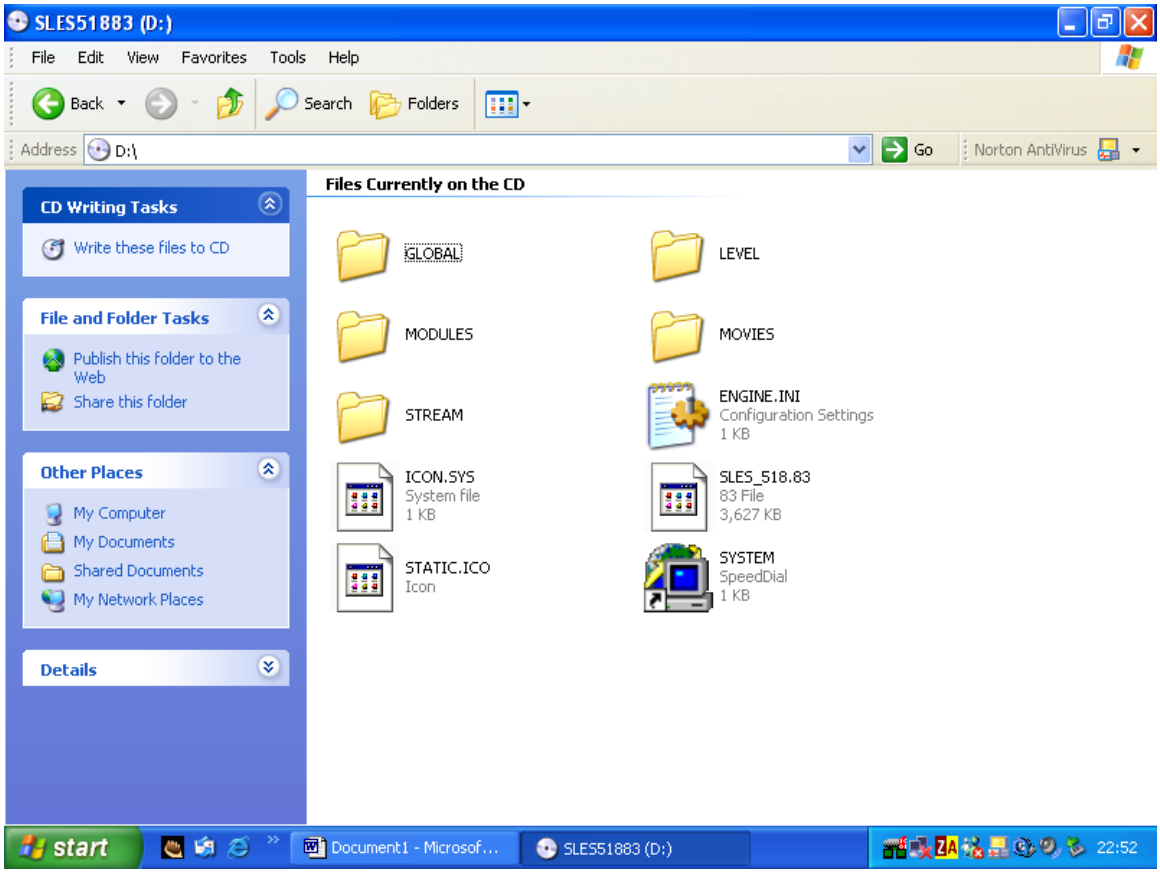
4. Software and Hardware

To be effective, software must be easy to use and allow easy porting of files from one application to another. Hardware should be able to run the software. Where companies use distributed systems, each department buys software that is best suited to its need.

Centralised information departments have more control:

- hardware is compatible throughout the company;
- purchasing power is improved through high volume bulk buying. A licence for a single copy of a program might be €500, while for a whole network it might be €3000;
- the organisation can get better deals on maintenance contracts;
- the same training is suitable for all departments;
- better control over unlicensed software;
- better exchange of data between computers.

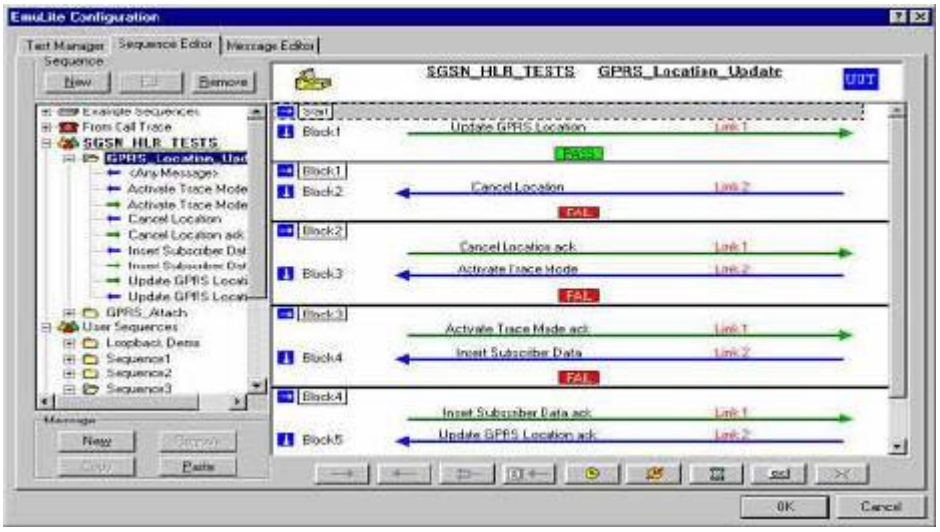
There are some companies which for historical reasons have computers of different types, for example PCs in one department and Apple Macs in another. These are called different **platforms**. Software that runs on a PC might well not run on a Mac. Another example that you might be more familiar with is the Sony Playstation. It is, of course, a computer, but with a different operating system to a PC. The PC can read a Playstation disk, but cannot process the files.



Many computer games come in PC or Playstation forms. The difference is in some of the system files which can only respond to operating systems of the same kind.

Upgrading on the same platform can usually be done with little technical difficulty, although sometimes files written on a new version of a program cannot be read by an earlier version. A file written on Excel 2002 may not work properly on Excel 97.

Emulation software will make a PC operate like a Mac and vice versa.



The advantages are:

- File types specific to a hardware platform can be read;
- The file types can be read without having to invest in new hardware.

Disadvantages are:

- The software might run slower;
- The emulation software occupies hard disk space, and takes memory when running (no big deal on modern computers though);
- The advantages of specialised software can be lost.

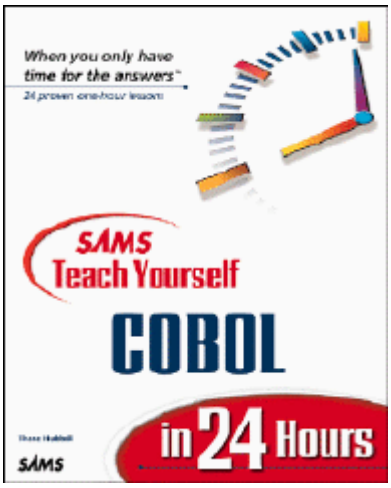
Emulation software is used less nowadays as manufacturers are trying hard to make their software run on any platform.

Question 5 A company has one department that has a network of old Macs, while another department has a new network of PCs. What problems can this cause? How can this be reduced?

Upgrading Hardware and Software

Many companies still use software that is up to 40 years old, based on COBOL (Common Business Oriented Language). It is still relatively common and there have been attempts to make it compatible with PCs.

It is still possible to get training on COBOL:



Some of the upgrades are done using out of date programming methods, and they are getting more difficult to maintain and understand. However the companies are still loathe to get rid of them because:

- they still work;
- replacing them would cost a fortune;
- of the problems in starting up a new system.

Even if the company has PCs, they may be old, and upgrades would be expensive, especially if there are several hundred. Piecemeal upgrades can cause compatibility problems between hardware and software.

Question 6 A new set of computers is going to be installed in a department in a company. The other computers are not powerful enough to run the new operating system. What problems will this cause? How can they be reduced?

Future Proofing

Five years ago the state of the art computer had a 500 Mhz Pentium processor, 128 Mb of RAM and 20 Gb of HDD. Nowadays, 5 years later, processors are six or more times that speed, 180 Gb HDDs are available, and 512 Mb RAM is common. All of this for less than half of what you would pay five years ago. What will computers be like in 2010?

My first computer cost about £1000 in 2000; it's still functional but is worthless.

Many companies find that they have many thousands of euros worth of equipment that is top of the range now, but in a couple of years will be outdated, and in four years it will be worthless too. The best strategy seems to be to buy equipment with far more capability than is actually needed to anticipate future need, but even so it's not possible to future-proof your ICT hardware or software completely.

Back Ups

As an ICT student you will have heard many times about the need for regular backing up of your work. In a home computer this can be done with:

- a flash memory;
- a floppy disk (not reliable);
- a CD ROM.

Question 7 Why is it important for a company to back up its data?

As a teacher who uses ICT extensively, I make sure I back up all my work regularly. My most important files I transfer regularly between computers at home and at work. Should one fail, I have a back-up so that I don't lose a vital file (e.g. my mark book). Last year my home computer suffered a major hard-drive failure. Since most of my work was backed up, I lost comparatively little, although what I did lose was tedious. My present computer has a mirrored **RAID** (redundant array of inexpensive disks) so that all my data are backed up on a second hard drive, simultaneously as they are written. If one fails, the data can be recovered.

While the loss of data on a home computer is tedious, for a company it can be ruinous. Most companies losing their data go out of business within months. Companies need to be more methodical than a home user, and should have a back-up strategy which will these issues:

- **How frequently** data are backed up. If changes are frequent, back-ups need to be frequent.
- **The volume of data**. If large amounts of data are to be backed up, then the time taken will increase. This consideration will affect whether all the data are to be backed up, or only the changed data.
- **The storage medium** will depend on the volume of data. A floppy disk can hold only 1.4 Mb, while a CD can hold 700 Mb, a DVD can hold 10 Gb, and a tape 100 Gb.
- Where the back-up will be stored, in a safe location away from the company's main computer facility.
- **Who is responsible**, for example, a senior employee. And who should act as deputy.

- **Logging the back-ups**, including noting the problems. Needless to say the back-up media and logs should tally.
- **Testing the back-up media**. This should be done to make sure that the data really are being backed up. It has been known for a disaster recovery drill to reveal that the backed-up media contained no data at all.

Software may need to be backed up. Indeed many licences allow for a back-up copy to be made.

Full Back-up

A **full back-up** is a copy of every single file, data or executable, on the disk. This is the safest way of doing it because there is a copy of every program and every data file. My own computer at home takes two and a half hours to back up. A business computer would take many times that time, during which time nothing can be done on it.

Let us look at how a company with a service contract with a computer company might do its back up:

- The service contract states that engineers will be on the company's premises within two hours if there is a problem.
- The file server may well have mirrored RAIDS, each containing identical data. If one fails, data can be recovered from the other. No further changes are allowed until repairs have been done.
- Four back-up media marked Mon, Tues, Wed, Thurs are stored in a fireproof safe in the office. The back-up starts at a certain time, and is loaded onto the appropriate medium. The system is checked first thing the following morning for any warning messages and that the backup has been successful.
- Every Friday, the senior employee responsible for back-ups takes the Friday disk or tape home, bringing back the Friday medium from two weeks ago on the Monday.
- The disk or tape is tested periodically. If anything is wrong the service company are expected to put it right.

Incremental Back-up

This kind of back-up uses a full back-up once a week. Changes thereafter are longed onto a medium marked with the day. So Tuesday's changes are backed up onto a Tuesday disk, and so on. This is less time consuming, but more complex to restore, as all back-ups have to be done in the right order.

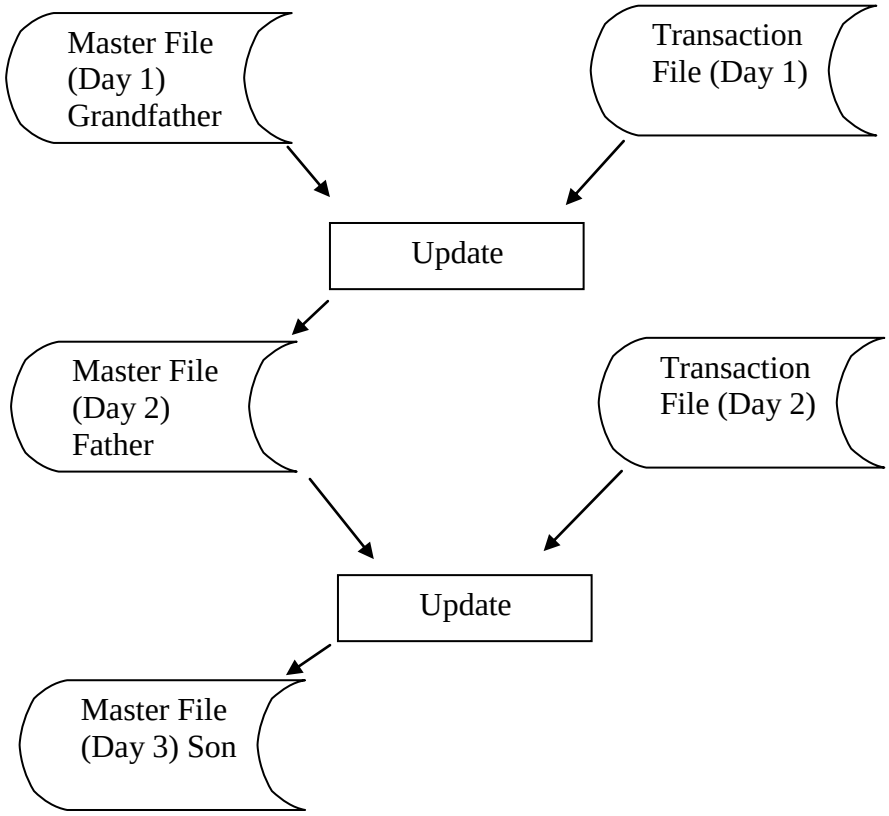
On-Line Back-up

There are many organisations that cannot afford to lose even a few seconds worth of data. They may well use RAID systems with possibly a hard-drive in a remote location. Should a drive fail, software allows other drives to be accessed, and all the data are available. The disk in the remote location

allows data to be accessed in the case of some severe event at the main processing centre (e.g. a bomb).

Grandfather-Father-Son Back-ups

This is an incremental system for batch processing. The diagram shows the idea:



Four generations of file are kept, before the oldest is overwritten. Two copies of the master file and each transaction file are kept. One pair is in a fireproof safe, and the other pair is off-site.

Backing up is tedious, but well worth it. However in small organisations it can be tempting to take short-cuts. Just putting the back-up media into a fireproof safe in the office is no good. What would the company do if some thieves nicked not just the computer, but also the safe? It has happened.

Back-up Hardware.

Zip drives used to be a common medium. They were like floppy disks, but could hold 100 Mb of data. That's nothing nowadays. For small organisations a CD or DVD will do very well. A DVD can contain 10 Gb of data.

Many organisations use digital audio tape drives; the pictures show digital audio tape and a drive.

The transfer rate is about 25 Gb per hour, so 50 Gb of data would take about 2 hours.

Question 8 A small company is working on its back up policy. State three back-up regimes and give one advantage and one disadvantage for each.