5 ICT Supporting Organisations

About this unit

ICT provides a wide range of tools and services that help organisations to operate and meet their business objectives. For most organisations, ICT has become essential for them to operate effectively and, in some cases, to operate at all.

Initially, ICT was used to support or replace existing business processes but increasingly it offers new possibilities and ways of doing business.

As well as the effect on the whole business, we need to consider how the use of ICT impacts on the work of individuals and their environment. Working environments change much more often than they used to, which means that individuals who work in such environments must change and adapt as well. Constant re-skilling is necessary, but ICT also offers new and exciting ways of learning new skills, such as web-based learning or e-learning. Continued from previous page

Learning outcomes

When you have completed this unit you will:

- 1 know the ways in which organisations use ICT
- 2 understand the reasons why organisations use ICT
- 3 understand the impact of ICT on individuals and organisations
- **4** understand how ICT can be used to improve skills and knowledge.

How is the unit assessed?

This unit is internally assessed. You will provide a portfolio of evidence to show that you have achieved the learning outcomes. The grading grid in the specification for this unit lists what you must do to obtain Pass, Merit and Distinction grades. The section on Assessment Tasks at the end of this chapter will guide you through activities that will help you to be successful in this unit.

The ways in which organisations use ICT

This unit is primarily concerned with how ICT is used to support organisations. This section looks at the various ways that organisations use ICT to handle information. As in the specification, this is divided into four key areas, though these often overlap:

- presentation of information, both promotional literature and technical documentation
- manipulation of information so that data can be interpreted, trends identified and forecasts and budgets created as an aid to decisionmaking
- communication of information, both internal and external
- management of information, i.e. the storage of data and the use of online services such as banking and shopping.

Presentation of information

Organisations may use ICT to present information to a variety of audiences, such as clients, staff and competitors:

- Promotional material will be produced to market the organisation, to show off its products and services to potential clients. This may include press releases and brochures, or material presented on a website.
- Promotional material may also be produced to advertise the products or services that the organisation offers. This may be in the form of advertisements in newspapers or magazines, or radio or TV adverts. Some organisations sell products through a website, so they will put a lot of thought into how the products or services are presented on-screen.
- Promotional material may also be prepared for potential staff: company brochures and job specifications can attract new staff and encourage them to apply for a vacancy.
- Technical material may be needed in support of products, e.g. to explain how to construct a bookcase from flat-pack 'ingredients'. Software products need manuals, as do cars and other products such as TVs and DVD players.

Many different applications packages are used to present information, all designed to be as easy to use as possible. Specialist software is available for authoring websites (such as Dreamweaver) and creating presentation material (such as Quark).

Three key applications were covered in 'Unit 1: Using ICT to present information' – word processors, graphics packages and presentation



Marketing is the function of making an organisation visible in the marketplace. It can include advertising campaigns, but also involves concepts such as branding, and establishing a company image.



Advertising is the act of promoting a product or service. It is an offer to potential buyers, which it is hoped will tempt them to make a purchase.

packages such as PowerPoint. Others that you might use include desktop publishing, spreadsheets and databases. All offer facilities to present information in graphical formats such as charts and diagrams, or as tables or reports.

Each application has particular strengths and possibilities. So, before starting to use ICT, you need to decide which application should provide the best tools for the situation and is most appropriate for the information you want to present.

Knowing the purpose of a communication or document is essential. This allows you to choose the best ways of presenting the information, and thus the best way of using ICT. You also need to have a clear idea of the possible audience, and such things as their interest in the information you are presenting to them.

Sometimes these distinctions can become blurred. A job description is a technical piece of information that needs to set out clearly the details about a job; however, it may also be used to promote the company as an employer to prospective staff.

Figure 5.1 shows an advertisement for a new mobile phone. It serves several purposes:

- It attracts attention. This is increasingly difficult to do because we are surrounded by images, information and advertising.
- It informs the reader of the key benefits of this particular mobile phone.

The software most appropriate to produce this type of advertisement is desktop publishing (DTP). This allows production and importation of



high-quality graphical images, mixed with text of various point sizes, colours and styles of fonts. Unlike word-processing software, DTP concentrates on page layouts, using text boxes and image boxes into which material can be pasted. So, while the copy (the words) might be written using Word, say, a DTP package would be used to prepare the material for printing.

Figure 5.1 Mobile phone advertisement



Further research – use of ICT packages

For each of the examples listed below, identify their main purpose(s), what ICT packages or tools might best be used to deal with them, and why:

- receipt for a product or service
- website used to sell CDs online
- job description
- computer manual
- internal monthly sales report
- fault-finding guide
- short internal notes to staff about things such as new people joining the company.

According to the needs of a publication, particular presentation techniques can be used:

- Paragraphs, bullet points and different line spacing, bold and italics can provide emphasis.
- Appropriate fonts can be chosen to meet the situation, or simple graphical tools such as 'call outs' can be used.
- Continuous text could be broken into chapters for a novel or story, or you might use formal report formats to present complex documents, with footers, headers and footnotes.
- If you are creating structured documents, you might include a detailed contents page and an index.
- For statistical data, you might convert numeric information into bar charts or pie charts. You might also incorporate simple line graphic images or diagrams.
- Brochures might incorporate full-colour graphic images or photographs.
- Information may also be linked, using hyperlinks on a website.



Further research – presentation techniques_____

Study the structure and layout of a computer user manual and then list examples of the different presentation techniques used.



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Case study

Layout of a computer dictionary

This is an extract from a computer dictionary:

Field Part of a record structure for storing a particular data item

Field length The number of characters in a field

Field type Classification of the type of data in a field (part of a record)

File protection A facility offered on most LANs to enable users to set rights to their files and

subdirectories for other users, e.g. read, copy and write

File server The computer which contains the network software

Gaming Using software to model a situation for the purpose of a game, e.g. modelling a forest where treasure must be found

Graphic user interface An operating system, or an addition to the operating system

Note that the layout is quite boring! However, it does not need to be anything else as readers will only dip into the dictionary when they need to find a particular meaning for a word. There is just enough line spacing between entries so that readers can see where one entry finishes and the next begins. The key phrases are emboldened and sorted alphabetically to make entries easy to find. Graphical images, colour or special fonts would be used in a dictionary only if they were necessary to understand a word. Full sentences are not necessary and would waste space.



The **Human Resources** (HR), or Personnel, department in an organisation is responsible for recruiting and paying staff. Particular departments within an organisation will use ICT for a variety of purposes in presenting information. The **Human Resources** (HR) Department, for example, could use ICT in each of these ways:

- A database may be used to record details about staff placements and training records. Reports from this database may be used to present statistics to the management team about additional staffing and training needs.
- All jobs may be specified and, when vacancies arise, this data may be used to create advertisements for placement in national newspapers.
- A brochure may be prepared to provide induction information for new staff.
- Leaflets and posters may be prepared to explain rules, e.g. the policy on use of the Internet and email for personal use during working hours.



Select another department (Accounts, Manufacturing, R&D, ...) and investigate ways in which they may use ICT to present information.

Manipulation of information

Most organisations collect and hold very large quantities of information.

For example, a supermarket collects information about the products they sell, how many are in stock, how much they cost, the selling price, who supplies them etc. This allows the supermarket to measure, among other things, the sales of different products over time.

Supermarkets, and many other organisations, also collect information about their customers, e.g. their typical age, their buying preferences, names and addresses.



Further research – collection and storage of information

What other information might supermarkets store?

Other organisations need to store different information. Identify another type of organisation near you and list the information it may store.

Interpreting data

Data is often collected as a series of numbers, e.g. sales data, banking transactions, attendance records or performance figures.

Organisations need to manipulate the information they hold in order to understand it better, to communicate or to make good decisions. In many situations, although the information is available, it may not be easy for an individual to interpret it; for example, it may not be obvious what the key points and issues are until the data is analysed and manipulated and presented in a more understandable way.

So, to help people understand data better, it could be summarised and trends identified by the following:

- Sales data can be analysed according to time (sales this week compared with the same week last year) or by salesperson (to identify who is the most successful or to calculate bonuses).
- Banking transactions can be used to identify closing balances on a daily basis, to work out charges for interest on overdrafts and to update monies owed or owing on sales and purchase ledger accounts.
- Attendance records might be added to check whether a member of staff is entitled to sick pay.
- Performance figures might be used to fine tune a mix of ingredients on a production line.



Manipulation of information means processing data for a particular purpose.



Case study

Interpreting data

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Table 5.1 shows some information about the sales of three different flavours of yoghurt over a two-year period:

- Which yoghurt was the best seller over the two years?
- Which yoghurt has increased sales over the two years?
- Which yoghurt increases its sales most during the summer months?
- What is the overall trend in yoghurt sales over the two years?

Year 2004	Strawberry	Cherry	Mango
Spring	23,000	14,000	6,000
Summer	35,000	21,000	14,000
Autumn	38,000	23,000	26,000
Winter	18,000	19,000	7,000
Voor 2005 Strowborny Chorny Mongo			
Voar 2005	Strawborry	Chorry	Mango
Year 2005	Strawberry	Cherry	Mango
Year 2005 Spring	Strawberry 21,000	Cherry 10,000	Mango 5,000
Year 2005 Spring Summer	Strawberry 21,000 37,000	Cherry 10,000 18,000	Mango 5,000 19,000
Year 2005 Spring Summer Autumn	Strawberry 21,000 37,000 39,000	Cherry 10,000 18,000 20,000	Mango 5,000 19,000 25,000
Year 2005 Spring Summer Autumn Winter	Strawberry 21,000 37,000 39,000 15,000	Cherry 10,000 18,000 20,000 21,000	Mango 5,000 19,000 25,000 7,000

If you are good at interpreting tables of numerical data, you may find that you can answer these questions without using ICT. However, in real life, the tables would be much larger, so using ICT to manipulate or process this information will make the job easier and faster. The data can be analysed so quickly that you can also experiment with lots of different layouts and styles to find the one that best suits your purpose. Choosing an appropriate presentational style is important; the information is more likely to be of value to us if it *informs* us better.

Numerical data can be manipulated by organising it in different ways in new tables and by using formulas to summarise it. You can also use different presentational techniques, such as graphs, to increase clarity. The information in Tables 5.2 and 5.3, and the charts in Figure 5.2, are all taken from the information in Table 5.1.

	Strawberry	Cherry	Mango
2004	114,000	77,000	53,000
2005	112,000	69,000	56,000
Total	226,000	146,000	109,000



	2004	2005
Spring	43,000	36,000
Summer	70,000	74,000
Autumn	87,000	84,000
Winter	44,000	43,000
Total	244,000	237,000

Table 5.3 Total sales in each season andfor both years



Figure 5.2 Bar chart showing total sales of each type of yoghurt over two years



Figure 5.3 Bar chart showing how the sales of yoghurt change by season for both years

Case study

Re-interpreting the sales data

With the benefit of these manipulations and graphical presentations, the information should be easier to interpret. Check how easy it is now to answer the four questions posed in the case study on the previous page.

Table 5.4 shows total yoghurt sales for the last 8 years. Convert the information to graphical format and use it to predict what the sales of yoghurts will be in 2006.

If you would like a real challenge:

- Consider how reliable the estimate of sales that you made might be – identify what factors might influence the changes in sales.
- Find out about the use of moving averages to smooth out the changes in the sales for each of the types of yoghurt – this may help you to predict the sales in 2006.

Year	Strawberry x 1000	Cherry x 1000	Mango x 1000
1998	178	105	0
1999	183	100	0
2000	200	96	0
2001	160	94	35
2002	135	95	52
2003	120	90	56
2004	114	77	53
2005	112	69	56

 Table 5.4
 Total yoghurt sales for 8 years

Sometimes 'manipulation' might mean changing the information to show something that is not true – or maybe emphasising something in an exaggerated way that misleads the reader. Hence you should be sure that what you are doing to the data does not lead to false conclusions. 9



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Case study

Inappropriate manipulation of information

It is possible to use ICT to manipulate and misrepresent information. As an example, look at Figures 5.4 and 5.5, showing the sales of cherry yoghurts in 2005.

The chart in Figure 5.5 is showing exactly the same information as in Figure 5.4, but it looks as if the sales





of cherry yoghurts increased dramatically between Spring and Summer. Check out the scales on the y-axis. Is it right to do this? What do you think?



Figure 5.5 *Quarterly sales of cherry yoghurt with different y-axis*

Decision-making

One of the main reasons for collecting data is to aid decision-making:

- A supermarket that keeps track of stock levels and sales is better placed to make decisions about when to reorder stock.
- An organisation that keeps track of monies owed by customers and monies owed to suppliers is better placed to avoid financial disasters due to cash flow problems.
- An organisation that 'knows' its customer base, is better placed to make decisions about which products to bring to market, and how to price those products.

Decision-making usually involves looking at what has happened to date and making some decision that determines what might happen in the future. For example, if sales are falling, a supermarket or store might consider a price reduction, or a sale to attract buyers.

Through careful analysis of shopping patterns of their customers, supermarkets can identify products that would make good 'loss leaders' to draw shoppers through the doors. The supermarket does not necessarily make an overall loss as a result of reducing the price of these particular items. Many shoppers are tempted to buy other products on which the supermarket makes a good profit – more than enough to make up for the sales of loss leaders. Organisations can also use historical data to forecast what will happen in the future. Having seen what happens in previous time periods (e.g. a slump in buying at certain times, and peaks at other times) an organisation can predict future sales trends.

Based on past experience, organisations can set up budgets – for example, using spreadsheet software – and use ICT for planning how monies will be spent in the future. Then, as time progresses, actual expenditure can be tracked and compared with the budgeted figures. Monitoring the match (or otherwise) with the budget provides a measure of control over finances, which is essential for the survival of organisations.



For an organisation known to you, find out how ICT is used for decision-making. How much is ICT used for planning, forecasting and budgeting?

Communication

Organisations need to communicate internally with their own workforce and externally with customers, suppliers and other agencies such as tax offices.

The benefit of using ICT to communicate is that the information can be sent more quickly, and usually cheaper, than by alternative methods. Saving time and money is important in all organisations.

Internal communication

When organisations communicate information internally, it is usually presented in simple formats, but matched to the situation. For example:

- Letters tend to be used for formal communications, such as notification of a promotion, or information regarding sick pay entitlement, or pension contributions. The contents of the letter are private to an individual, although similar letters may be sent to several of the staff. The HR department may generate the majority of these letters, and confidentiality is essential.
- Newsletters are used to disseminate information to all staff, not just to an individual. A newsletter can be used to make announcements about changes within the organisation, e.g. new offices being opened, new appointments within the organisation, new contracts won and other good news. Bad news may be announced in a less public way, through face-to-face meetings or by letter.

Memos are used to inform others of information, such as a change to the starting time for a meeting. Memos are sent from one person but may be addressed to several. Memos are not used for recording important decisions – these will be found in minutes of meetings – but they are a valuable alternative to telephoning a colleague or walking to their desk to tell them something.

Speed, accuracy and costs are always important to an organisation, so ways of using ICT to improve efficiency are always sought:

- It may not be appropriate to send a letter to a member of staff electronically, because a hard copy may be needed as evidence, for example, a signed contract of employment.
- Newsletters could well be provided electronically. For organisations with an intranet, the newsletter could be made available online to all staff, and an email sent to say that the latest issue is now available.
- Memos are almost a thing of the past. Email and intranets are often the cheapest and quickest ways of communicating with colleagues.

The opportunities that ICT offers therefore often make intranets and email the first choice of communication for most organisations.

An internal network of computers may be set up to allow sharing of resources, such as data and printers. Such a network may be provided with an intranet that offers similar facilities to the Internet and often allows staff to link to sites on it. However, it is available only to people inside an organisation; no one outside the organisation should be able to access its information. Apart from dissemination of communications such as newsletters, an intranet might be used to provide information such as staff telephone numbers, menus for the staff canteen and training courses available to staff.



What other information might be stored on an intranet?

Nowadays, email is used extensively to send messages between individuals. It is easy to set up distribution lists or email groups; these might include everyone in one department or everyone in the company. Using distribution lists, messages can very quickly be sent to large groups of people.



Make sure that you know how to set up a distribution list using your email software.



An **intranet** is a closed system that has many of the features of the Internet (e.g. email and company web pages) but is accessible only within an organisation.

External communication

ICT is used by organisations to communicate externally in a number of ways:

- Websites are used to present customers with information about the organisation's activities or products. Websites also often allow customers to purchase products or services online.
- Desktop publishing packages are used to produce leaflets that are then sent by standard mail to potential customers.
- Word processors are used to produce individual letters that are posted in the normal way. Word processors are also used, in conjunction

with databases, to send similar letters to lots of different people using mail merge.

- Invoices are produced by specialist accounting packages to be sent to customers – possibly as email attachments or sometimes using B2B or B2C websites.
- Emails are used to communicate with many different people outside the organisation, including suppliers and customers.

Email is now the most popular way for organisations to communicate externally, and the use of email for marketing purposes is set to grow dramatically. See Figure 5.6.



Figure 5.6 Example email



B2B means Business to Business – the most common type of website used to communicate between businesses.

B2C means Business to Consumer – B2C websites help organisations to connect directly with their customers.



Further research – possible disadvantages of email

There are many advantages of using email to communicate. Are there any disadvantages?

Managing information

The more data that an organisation collects, the more important the management of that data becomes. The use of databases to manage information is at the heart of most organisations, and a high proportion of jobs relate in some way to the input, processing and output of information from such databases.



Figure 5.7 Single-table employee database

Storing and maintaining information

A database is a collection of data, held in a structured way so that it can be easily added to, deleted, amended, sorted, searched and reported on. The data is stored in tables.

Figure 5.7 shows an example of a simple, single-table database of employees.

Data is constantly changing and keeping the database up to date requires constant maintenance, such as:

- adding details of a new member of staff
- amending staff details (address, salary rise etc.)
- deleting records of staff who are no longer with the company.

Maintaining an up to date database is time-consuming, but the benefits outweigh the time and energy taken in maintaining this information:

- It is easy to search for details of a particular member of staff on the database. Rather than having many filing cabinets of paper files located in one department (or worse, duplicated in a number of departments), electronic records allow more than one person to access the data and from anywhere on the network of computers.
- Hard copies of data can be easily provided, e.g. listing names of people in a department with their telephone numbers.
- Interrogating the database will answer questions quickly and easily. For example, finding out which staff have been in the company for more than 10 years e.g. to give them a long service award is a simple activity on a database.

Test your knowledge

- 1 Find out, or guess, what other information about their staff an organisation might want to store.
- 2 Identify what other activities or reports organisations might want to extract from the staff database in Figure 5.7.
- 3 Identify some databases that organisations might choose to put on a website for their customers to access directly.

Competitor details

Knowing what competitors are doing, or planning to do, is essential information for any organisation.

An organisation's website can provide an overview of its operations. So, for example, if your organisation was trying to decide on new market

opportunities, you might do some research on the Internet to find out what other organisations provide the product or service you plan to develop.

There are other legitimate sources of information about competitor activity:

- Companies House retains information about trading performance.
- Financial newspapers provide statistics about share movements, plus news and gossip about possible bids for takeovers etc.
- Job advertisements may provide insights into what a competitor is planning to do, e.g. open new offices or expand operations overseas.

Any data that is collected, even informal gossip, should be stored in a database for ease of retrieval. However, care should be taken not to infringe copyright. It is illegal, for example, to scan many types of document, such as press clippings.

There are both ethical and unethical methods by which competitive intelligence is obtained. To collect sample job advertisements is acceptable; but to send someone to apply for such a post, just to find out insider information, is not ethical! Spying or business espionage – hoping to find titbits of information by going through an organisation's waste bins – is highly unethical, and may be criminal.

There are organisations offering an ethical service in the area of competitor activity analysis, which may be of use to a company. Such organisations evaluate your competitors' marketing activity, identifying opportunities and threats to your business, which then enables you to take appropriate action.



Further research – competitive intelligence

Do a search on 'competitive intelligence' to find more about how an organisation might glean information on its competitors.

Online services

Many organisations make good use of online services to increase opportunities for trade, by doing the following:

- Giving prospective customers the option to buy products and services online.
- Using online banking for transactions.



Further research – services offered via websites

Visit the website of your bank and find out what services are offered to business customers.

The reasons why organisations use ICT

The previous section considered how organisations might use ICT:

- to manipulate and present information in ways that help the organisation to operate
- to communicate internally and externally via email, and through intranets and the Internet
- to manage information, using databases in ways that make it easy to find particular items of information, as well as analysing and reporting on the information.

There are other factors, however, that encourage organisations to use ICT, and these can be categorised as external and internal.

External factors

External factors are those that are imposed from outside the organisation.

Exploiting new technolgies

With each new invention or technological breakthrough, organisations are faced with the option of exploiting the new technology or risking being left behind when competitors embrace it more fully and take market advantages. For example:

- How many shoppers would do their weekly shopping at a supermarket that did not accept payment by credit card?
- How soon will it be before all air travellers book seats online and rely on email confirmation, rather than having to receive flight tickets through the post?
- How long will it be before paperbacks and hardbacks become a thing of the past, with books being read off a palmtop?



Think of other new technologies (such as CDs and DVDs) and how they have changed the way organisations communicate information to a client base.

Search the Internet for examples of new and emerging technologies, such as IRIS technology. How might the use of biometric data transform air travel?

Consumer expectations

There is a saying: 'Consumer is king.' Historically, the consumer is seen as king in both international trade and business management. Personal preferences play a pivotal role and, in business circles, consumer preferences are recognised as a driving force in the economy. Consumer values should be used to inform any business decision simply because consumer expenditure determines whether a business will survive.

Nowadays, consumers are increasingly well informed. They are also vocal and discriminating and make demands on suppliers.

In the food industry, for example many consumers expect and demand specific food-product attributes. They show concern for food safety and nutrition, and expect foods to be properly labelled.

Wealthy, educated and ethnically diverse consumers expect to enjoy access to food products across the international marketplace. If a cookery programme, for example, introduces the viewers to a new spice or special ingredient, such as an exotic fruit, supermarkets need to be ready to meet the demand for that product or risk losing out on sales, and on the loyalty of the existing customer base.

Many consumers also expect more personalised attention from retailers. Such discriminating consumers lead to discriminating retailers who then, in turn, impose new demands on domestic and international suppliers.



Further research – changing expectations

Visit the websites of at least two leading supermarkets and find out what efforts they make to meet the changing expectations of their shoppers.

Investigate what is happening in the food industry about labelling of food.

Pace of change

There was a time when managers could have an annual weekend away, planning for next year's new products. Nowadays, change happens so quickly that managers need to be prepared to make plans that can be changed if and when circumstances change.

Organisations need to make links with suppliers that not only involve discussions about how the supplier will provide the products or services needed, and how much money will be exchanged, but also how the products might be improved. Cooperation between supplier and consumer means that each is more aware than before of the lead times for development of new and innovative designs.

ICT products are used extensively in **R&D**, and **CAD/CAM** products provide greater flexibility than the non-ICT methods of old.



R&D stands for research and development.

CAD/CAM stands for computer aided design/ computer aided manufacture.

Changing market needs

Every organisation has to be aware of changes in market needs:

- As a population ages, as is happening in the UK and in many other Western countries, the pattern of consumption changes. Providers of goods and services must be ready to change to meet the new demands.
- People also move to where jobs can be found, so markets change.
 Where there are no customers there is no trade.

Keeping track of the make-up of a client base is made easy through the use of databases. For example, supermarket loyalty schemes give supermarkets the option to ask questions to find out more details about their customers, their circumstances and preferences. Also, each time a loyalty card is used, the mix of products bought can be monitored. This allows the supermarket to watch for trends, and to stock shelves to meet these trends.



Undertake research to find out more about loyalty cards.

Changing legislation

If new legislation is enacted, for example to set higher standards of safety for electrical equipment, then an organisation producing such products has to revise its designs accordingly. Keeping track of standards, and which products meet which standards, is a complex and information-rich problem, best solved using ICT.

Sometimes, the introduction of new legislation forces organisations to use ICT differently. One example is the Data Protection Act, which forced all organisations to reconsider what information was stored about individuals, and how, using ICT, that information could be checked and accessed by those individuals.



Case study

Additional ways that organisations may exploit ICT

Gleesons is a publishing firm that has produced novels, textbooks and other written materials for 30 years. They are subject to changing conditions in the environment in which they operate and this is making them think carefully about the need to use ICT and the impact of ICT on their internal communications. Listed below are some of the things that are changing and how each might change the way that they use ICT.

Things that are changing	Possible impact on the way ICT is used
Customers are changing their expectations of how they want to access the publications.	Books produced on CD-ROMs with background materials. Books sold as electronic files and 'read' on palmtops.
Printing companies expect text to be sent to them as electronic files instead of on paper to make the whole process faster and cheaper.	The organisation must be able to handle text as electronic files, making backups as necessary and attaching them to emails to be sent to printing companies.
Writers expect to work at home or in different locations but still expect continual feedback as the books are being written.	Text can be sent to reviewers quickly and reliably by email, so that feedback can be quick.
A new company has started up and is selling a similar range of publications at cut price.	To compete successfully, Gleesons could increase staff skills to make better use of ICT in their work.
Suppliers have purchased new publishing technology, such as cheaper colour printers that can reproduce high-quality images cheaply.	Writers are not limited to using text and simple line drawings. Full-colour photographs can be incorporated into materials.
Customers expect to be able to browse and buy books using the Internet.	The organisation needs to invest in a website that allows them to operate as an e-business.

For each of the six examples above, choose which of the following types of external factors is being described:

- organisation exploiting new technologies
- suppliers changing their expectations of how information is transferred
- changing market demands or increased competition.

Internal factors

Internally, there may be other reasons why an organisation needs to introduce ICT.

Most organisations need to operate at a profit; even the organisations that are not profit-making need to control their costs.

The introduction of ICT offers cost savings, greater control over cash flow, and many other incentives. Many of these are discussed in the next section, in which the impact of ICT on both individuals and organisations is considered.

Case study

Additional changes that may impact on ICT use

Things that are changing	Possible impact on the way ICT is used
Managers need more detailed information to make decisions about which publications to promote.	Gleesons could decide to invest in a database system that stores sales information and produces regular reports to managers.
New forms and systems are introduced internally and it is important that all staff use them.	An intranet could be created and the new forms be placed in a folder that everyone in the company can access.
The Quality Control department has indicated that the materials must all be produced to common standards.	Style sheets could be created and stored on the intranet. Emails could be sent to all staff indicating that they must use these new style sheets.

For each of the three examples above, choose which of the following types of internal factors is being described:

- increasing cost effectiveness
- improving quality control procedures
- getting better information in order to make better decisions.

Understand the impact of ICT on individuals and organisations

In trying to understand the impact of ICT on individuals and organisations, it is useful to consider a variety of aspects:

- Technological change tends both to add sophistication and to create more user-friendly interfaces between the human and the technology. The net result is an increase in **complexity**, which individuals and organisations need to embrace.
- A desire to increase profits or just to stay in business often leads to an attempt to increase the capacity of an organisation, by increasing the throughput of work done by individuals within the organisation and creating a greater reliance on the amount that is done using technology.
- The impact of ICT on individuals and organisations is ongoing, so it makes sense to consider **trends** that have evolved – and are still evolving. This can help both individuals and organisations to anticipate better what is yet to come, and to prepare for future technological change.
- One of the greatest changes, since the introduction of ICT into the workplace, has been the nature of the working environment. For many, ICT has provided the freedom to work from home; for others, it has radically changed the face of the office in which they work.

These four aspects – complexity, capacity, trends and the working environment – are the subject of this section.

Complexity

The lives of individuals – inside or outside an organisation – are becoming more and more complex as each new technology is introduced, and different people adapt to the changing environment in different ways.

Some surveys suggest that older individuals, in general, do not respond as well to change as their younger counterparts, unless the change is gradual and over time. You may have older relatives who have difficulty coming to terms with such things as new mobile phones, DVD equipment and Internet connections.

Technological changes have affected us since the beginning of recorded history. However, the scale and pace of change has increased dramatically, especially in the last 50 years, with massive impact on how organisations operate and what they produce.

Naturally, staff are expected to adapt to this ever-changing technology. Within an organisation, older staff may have greater experience in the day-to-day office requirements and in the products or services provided by the organisation. However, these long-serving staff may stumble when new technology is introduced and their methods of working are challenged.

Skills needed to use technology

In many situations, a higher level of skills is needed in the workplace than ever before. The transition from typewriter and filing cabinets to word processors and computerised databases has meant that a higher

End Pro	ogram - Document1 - Microsoft Word	×	
W	The system cannot end this program because it is waiting for a response from you.		
	To return to Windows and check the status of the program, click Cancel.		
	If you choose to end the program immediately, you will lose any unsaved data. To end the program now, click End Now.		
	End Now Cancel]	
		1	

Figure 5.8 The consequences of making a mistake

and broader level of intellectual skills is needed. In addition, the consequences of making mistakes have increased (Figure 5.8).

Managers used to manage people; now they still have to manage people but usually do not have an army of secretaries and other clerical staff in support roles. Instead, managers write their own emails and letters. There may be templates to guide managers as to the required wording of certain standard communications, but the checking of these letters and ensuring they contain no mistakes falls to the manager. Concepts like centring headings and laying out a letter well on a page, which used to be skills taught to a typist, are now expected of most workers.

In a design studio, graphic designers used to work at a draughtboard with a pencil. Now they use sophisticated software. While the software provides many benefits, the designer now needs not only artistic talent but IT literacy and the ability to convey design concepts using a mouse or other input device.

Librarians of 30 years ago spent their time handling books. Nowadays, a library is equipped with computers, providing research tools for library users as well as library staff. The process of lending books and recording reservations is often done online, which changes the job requirements for staff who operate the libraries during opening hours.

In the past, teachers used 'chalk and talk' to teach. Nowadays, a teacher is expected to create worksheets using word-processing software, to prepare presentations using software such as PowerPoint and to use various other software packages during the teaching day. They are also expected to incorporate new hardware, such as a whiteboard, into their delivery of the curriculum.



Look at what technology is used in your place of work or learning. What special training was needed and provided for the users of this technology?

Consider three jobs where technology has changed how people work. What new training will they have needed?

Technology replacing the work of individuals

Some highly skilled and respected physical work is now routinely done by automated processes:

- In publishing, typesetting used to involve placing metal into frames to set up a page, and it required years of experience to know how the finished printed page would look. Now this work is done using software such as Quark, and the old-fashioned methods have all but disappeared.
- In the manufacturing industries, tasks such as assembling and building cars are now done using robotics. Some jobs that have been replaced were dirty or dangerous, but people have been replaced by machines in other areas too.
- Even in areas like the medical profession, some tasks are being automated.

As well as finding that some of their existing skills are now redundant, staff also need to cope with learning how to control and operate the new technology.

Individual and support needs

All the issues surrounding the changes brought about by technological innovation, and the pace at which it happens, have created a climate where any particular set of skills may be short-lived. You may go on a course for a particular software package one year, only to find that the software is later upgraded and includes improved features – which you will need to learn about, if you are to make the best use of the software.

This requires an increased focus on training and retraining, as well as a need for employers to engage with individuals to plan their support and training needs. This can be seen clearly in many colleges and training schools, where the emphasis is on 'lifelong learning' and workforce development.



Find out which courses are available in your local college for someone who needs to learn about using technology in the workplace.

Capacity

Increasing ICT capacity can result in greater levels of achievement for an organisation. However, this needs to be carefully planned and properly managed.

One of the most tempting reasons why organisations are increasingly using technology is that it can reduce costs. Sometimes this is because the technology has actually replaced the work of individuals but, in other cases,

it is because individuals can handle an increased workload because of the improvements in speed and efficiency.

For most applications, the use of technology allows a greater number of transactions to be handled, without increasing the size of the workforce to match. For example, the number of credit card transactions that the credit card companies can handle depends on the capacity of the computer storage and processing rather than the number of staff – though an increased use of credit cards might increase the possibility of computer fraud, necessitating more staff to handle this problem. A further example is shown by the following historical case study.

Case study

ERNIE, an historical comparison

ERNIE stands for Electronic Random Number Indicator Equipment and was the name given to the original machine that produced the numbers of the Premium Bonds that won monthly prizes. When ERNIE made its public debut in 1957, it was the size of a van. At this time, the top prize was just £1,000. The new machine took just over two hours to 'draw' the winners but, if this same ERNIE were used today, with the number of bonds in circulation now, it would take 52 days!

Figure 5.9 shows people checking and organising the Premium Bonds in the 1960s. There were many working rooms and copies of every bond issued were held in large cabinets. Figure 5.10 shows workers sorting and organising the bonds, as well as searching for winning ones that had been chosen by ERNIE.



Figure 5.9 Checking and organising Premium Bonds in the 1960s (Source: National Savings & Investments)



Figure 5.10 Sorting, organising and searching for winning bonds (Source: National Savings & Investments)

Test your knowledge

- 4 A typical page of this book has about 350 words on it. Using this as an average, calculate how many pages of this book could be stored on a 32 MB pen drive or a CD-ROM, and then list the advantages and disadvantages of storing the information in this way, as opposed to storing it as physical bits of paper. Assume that the average length of a word is 6 characters and that each character needs one byte of storage space.
- 5 Find an example letter from an organisation that is clearly bulk mail, i.e. something sent to hundreds or thousands of people. Consider and discuss the practicalities and costs of how these letters are produced. They could be:
 - typed one at a time
 - typed once and then photocopied with key details added separately, maybe by overprinting
 - mail merged using a word processor.



Further research – impact of new technology on clerical activity

Estimate (in minutes) how long it would take for one person to type a one-page letter. Now estimate how long it would take a person to prepare 1,000 letters, which were all the same except for a few key details, if they:

- typed each one at a time
- typed one and then mail merged it with details about each account from a database.

Your answers will only be estimates, but consider what impact these numbers have on the number of administrative staff employed and the levels of skills needed.



Further research – advantages resulting from a customer database

Consider the advantages of having a customer database that stored lots of information about each customer: their buying habits, whether they had children, what holidays they typically went on, their ages etc.

Can you think of how you might use such information to target more carefully the letters that you could mail merge and send to them?



In planning for future change, it helps to look back and to identify trends in technological change. Some that have been identified through research are discussed below: standardisation, software innovations, wireless technologies and WIMP interfaces.

Standardisation

When an organisation wants to upgrade an existing system, to provide a better system for its staff and to meet market needs more closely, a lot of effort may be needed to integrate the **legacy systems** with new IT systems.

Because technology has moved on, it can prove too difficult to integrate new systems with the legacy systems. Instead, a completely new system may need to be installed, which is both time-consuming and expensive.

To cope with the issue of upgradeability, many hardware and software suppliers are aiming for standardisation, i.e. making sure that their products work with other products. This allows organisations to upgrade rather than replace complete systems.

Organisations planning an upgrade will, naturally, try to choose hardware and software that fits in with what they already have, and promises to fit in with future developments. The platform on which an ICT system rests is the most important decision. After years of there being a variety of vendors, the choice now falls mainly between Apple Mac and Windows environments. Having made that decision, an organisation is then limited in subsequent decision making.

Some suppliers of hardware and software prefer for their products not to work with others. They seek domination in their particular field. If such a supplier can capture a market, this tactic works; but it can be risky. Unless you are a very large company with a large existing customer base, such an approach could well result in your product being sidelined, regardless of how brilliant an invention it might be.

Some software vendors recognise the importance of the platform (Mac or Windows or others) and develop versions of the most popular software packages to suit more than one platform.



Research the Internet for videotape technologies. Which ones were introduced? Which were adopted? Which were best?

For one software vendor, e.g. Adobe, check which platforms they support for a range of software products.

USB ports are now a standard way of linking a peripheral to a PC. List at least five items of hardware that you might attach via a USB connection.



Legacy systems are those applications, and ways of storing data, that an organisation may want to use as part of an upgraded system, but which were developed with languages, hardware platforms or other technologies which are no longer current.

Security and privacy concerns

One of the most important trends, in the years since the development of the Internet and increased use of communications technologies, has been the increased importance of ensuring that the new technology respects the security needs and privacy of individuals. This is particularly important in the case of individuals buying goods over the Internet. Software has been developed to meet this need, together with a whole raft of icons and terminology that users need to learn about.



⁻urther research – data security

Find out how transfer of data can be made more secure when communicating sensitive data, such as a credit card number.

Database design has undergone quite a revolution in the last 50 years. Relational databases are a relatively recent addition to the standard software to be found on PCs. They solved many data handling problems. However, as they have become more commonplace, solutions are now urgently needed to help organisations and individuals to manage the **infogluts** that are now resulting.

Because more and more information is being collected into larger and larger applications, it is expected that this trend will continue for some time to come. **Data mining** is one solution.



Find out, through Internet research, what is meant by the term data mining.

Remote and collaborative working

Wireless technology is one of the most exciting developments for ICT systems. Significant new technologies, such as Bluetooth, have heralded the increased use of technologies for remote and collaborative working and for leisure pursuits.

The use of wireless communications technologies, on devices such as mobile phones and laptops, opens up many possibilities for users to enjoy Internet access while on the move.

Wireless technologies for peripherals are also set to increase. Once users have experienced the freedom of a wireless mouse, they are unlikely to want to return to one that is attached to their PC by a cable.



The term **infoglut** describes very large volumes of information that can be difficult to work with or analyse.



Research the Internet for the range of peripheral devices that can be bought in a 'wireless' form.

Find out about Bluetooth technology.

WIMP interfaces

The introduction of the **WIMP** environment has revolutionised the way people use PCs:

- The use of windows allows users to emulate a 'normal' desk environment, even with several tasks on the go at any one time, because each can be visible through a separate window.
- Icons were introduced as a shorthand for functions and options. These have become standard features, with the same icons – or very similar ones – being used by all software vendors.
- Menus accessible via toolbars provide a route to all options. The user does not need to memorise codes or a special language.
- The pointing device (mouse, tracker ball or joystick), together with the different shapes and designs of the cursor, indicate the type of action involved as the cursor moves across the screen. An arrow might point at something you might click on; grab handles show where you might need to use drag and drop.

Prior to the invention of the mouse, all input was through the keyboard. That was many years ago, but even now, in a WIMP environment, 'power users' tend to use the keyboard to give instructions.



Further research – cursor designs

Investigate the different designs of cursor displayed as you move the mouse in a software package such as Word. Check that you know what each indicates.

Market leaders

The design and production of software is costly. Software developers need to be sure of a market before committing large amounts of time and expense to research and development. In recent years, there have been mergers between large software manufacturers, reducing the amount of competition in the market. In one way this is bad news; costs of software are high and there may be few alternatives available. The good news is that, if you know how to use one product, it will be relatively easy to learn how to use other products supplied by the same software developer.

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Vhat does

WIMP stands for

pointers.

windows, icons, menus,



Check the trade press and the Internet to learn about recent takeovers and mergers of software manufacturers.

In companies that develop and manufacture hardware, research is very costly and so the number of players has dropped, leaving only those that are established in the market and trusted by the client base.



Further research – hardware manufacturers

Use the Internet to identify major players in the development of one particular hardware device, e.g. printer, scanner or DVD drive. How do these organisations retain their market share?

Future trends

It is difficult to predict future trends. However, there are likely to be increasing connections between different technologies. Many people now use computers to listen to radio and music CDs, or to watch DVDs, and some Internet providers allow the sending of email through the television set. This blurring and merging of technologies is set to continue.



Investigate the different ways you could access your emails: through a TV, a mobile phone, or your PC. Contrast and compare these methods.

Workforce trends

More and more people need to understand how to use and exploit information and communications technologies. In January 2006, it was estimated that, for the UK:

- more than 150,000 new entrants into the specialist IT workforce will be required each year, at least up to 2015
- 20 million people need routinely to use IT in their work.

Other visible trends include changes in the working environment (discussed on the next page) and outsourcing of work, where particular parts of the work of organisations are placed in the hands of specialised companies. Sometimes, as is often in the case with call centres, these are based abroad. The main drivers for outsourcing are reducing costs and increasing efficiency.

In general terms, there is a need for greater returns on IT investment, and individuals need deeper and broader sets of skills. Training – and the willingness to accept re-training – therefore becomes important for everyone who hopes to play an active role in the workforce of the future.



Research the Internet to discover where call centres tend to be located. Which countries are benefiting from the decision to outsource this form of support?

Working environment

The typical working environment has changed and continues to change. The daily routine, for many members of staff, is now based on the use of a computer. The evolution of the human body has not, however, prepared workers for such work, and it is important that any negative impacts are compensated for, or eliminated as much as possible.

This section looks at the many issues related to the working environment:

- How can a workspace be designed to suit the individual worker?
- What steps can be taken to identify and minimise risk to health and safety?
- What steps can be taken to reduce the risk of loss of data within the workplace?
- How can access to ICT benefits be improved for those with special needs, such as mobility problems or sight impairment?
- What are the pros and cons of working from home?
- How can ICT-based information sources be made available to all those who need them?
- How are electronic communication methods, such as email, changing the way that staff communicate?

Ergonomics

Ergonomics is an area of study that has gained prominence in recent times in the design of workspaces, providing safe and comfortable conditions for computer users.



Ergonomics is the study of the interaction between people and machines.

Unit 5 ICT Supporting Organisations

It includes the design of the chair you sit on, the height of your desk and the angle of your computer screen (Figure 5.11). A poor arrangement can have disastrous effects on the back and neck, eyes and wrists.

The ergonomics of the workplace can, therefore, have a great impact on staff, and the removal of hazards can significantly reduce risk of injury. Organisations need to ensure their office environment is both safe and reasonably comfortable. Typical questions include:

■ Is there sufficient good light? Overhead lighting needs to be satisfactory. Lowfrequency fluorescent strip lighting causes flicker and visual disturbances on computer screens and should be avoided.



Figure 5.11 Sitting comfortably

Is there adequate ventilation? Is it a comfortable temperature? People work best if they are not too hot or too cold. The ideal temperature is around 21°C. People should not have to sit close to radiators (to keep warm) or to doors (to keep cool). Air conditioning systems can also control the humidity, which can adversely affect both workers and the equipment.

• Are the noise levels bearable? Background noise can distract workers. This can be reduced by having quiet floor coverings; also, screens or partitions placed strategically in open plan offices can muffle sounds. The computer equipment can sometimes be too noisy and this also adds to stress levels.

The increasing pace of change has caused the creation of 'new' medical conditions such as technostress. The condition may be caused by poor ergonomics. It may also be experienced by staff who are struggling to cope with the skills demanded by new technology. Other factors include:

- 'information overload'
- boredom through under-work and routine jobs
- job insecurity and demotivation.

Here are two more 'new' medical conditions:

- Carpal tunnel syndrome is an irritation of a nerve in the wrist that causes tingling and numbness of the thumb, index, and middle fingers.
- **RSI** is caused by repeated physical movements damaging tendons, nerves, muscles and other soft body tissues. This injury is due to excessive use of certain muscle groups and results in pain in the shoulder, neck, arm, wrist or hand - the problem can become permanent.



Technostress means stress that has been caused by the introduction of new technology.



RSI stands for repetitive strain injury.

There are several ways that RSI can be avoided and the risk of other damage reduced:

- Chairs should be adjustable so that staff can sit comfortably with the correct posture while working at the keyboard and monitor.
- Changing position from time to time, and taking frequent breaks, especially from repetitive work at the keyboard, can give muscles a chance to relax. Because of this, staff should be encouraged to take regular breaks from using the computer.
- Monitors should be adjustable. They should be fitted with filter screens if glare is a problem.
- Desks and floor space should be free from hazards such as trailing cables.
- Procedures should be adopted so that computer users do not tamper with any electrical equipment, or consume food or drink while working at the computer (in case of spillages).



Working with a friend, focusing on where ICT is being used, assess the ergonomics of your workspace at your centre of learning or place of work. Make notes on how this might be improved.

On your own, assess the ergonomics of your ICT workspace at home. Make notes on how this might be improved.

For an organisation of your choice, assess the ergonomics of the workplace used for ICT. Write your findings and recommendations in a report.

Find out more about carpel tunnel syndrome.

Health and safety

Because of **hazards** in the workplace, staff face a variety of **risks** to their personal health and safety during their normal working day.

The basis of health and safety law in Britain is covered by the **Health and Safety at Work Act (1974)**. The Act sets out the general duties that employers have towards staff and members of the public. It also explains the duties that staff have for their own health and safety, and that of others.

The main requirement on employers is to carry out a risk assessment. To comply with the Health and Safety Act 1974, employers must:

- assess risk to staff and provide a risk assessment
- set up emergency procedure provisions as identified by the risk assessment
- appoint competent people to help them to implement the arrangements
- provide staff with clear instructions and give training where necessary.



A **hazard** is something that might cause an acccident.

Risk is a measure of the likelihood of an accident happening.

One way to identify health and safety hazards is to ask staff to complete questionnaires on a regular basis. Another way is to carry out an audit; this must be done regularly and action taken to remedy situations that present a hazard, e.g. trailing wires or obstacles.



Further research – health and safety

Find out who is responsible for health and safety at your centre of learning or place of work. How often do they carry out risk assessments? What methods do they use to collect information about hazards in the workplace.

Security risks

Data can be lost through the physical loss of equipment or an attack by a virus. You should be aware of these risks and how to avoid data loss due to them. You will have learnt about the security of ICT systems in the core Unit 2.

Accessibility

Technological developments in the **HCI** allow those workers with special needs to make the best use of ICT equipment. Here are some examples:

- Voice recognition software is available for those who do not want to, or cannot, use a keyboard as the main input device.
- Large-print output helps the partially sighted.
- Special equipment is available for those with more severe physical disabilities.



Further research – assistance for workers with disabilities

Investigate the availability of devices to aid those workers with disabilities, such as the loss of an arm.

Organisations are now responsible in law for the health and safety of their staff, and this has created increased pressure for such issues to be considered and dealt with. We have not yet reached the stage where individuals have spent their whole working life using computers – most of the adult population over 50 today did not grow up with such technology. Only time will tell what the real impact of such concentrated, and very long term, use of ICT will be.



HCI stands for humancomputer interface.

Further research – health and safety issues

Find out what an organisation does to make sure that their working environment is healthy and safe for their staff. Take into account the following issues:

- ergonomics
- how they identify possible health and safety risks
- how ICT can be used for people with disabilities.

Home working

Ways of working have changed. More and more people have the freedom to work from home, combining responsibilities of parenthood and other family ties with their job.

Instead of being based in an office with everyone else who works for the organisation, staff can be based at home and be more mobile generally by using mobile and communications technology.

Having staff work from home has benefits for the staff. It also has benefits for the employer and for society as a whole:

- For the staff, there is no commuting, so more time is available for work or leisure. There are also savings in travel costs.
- For the employer, there is a reduction in desk space. **Hot-desking** becomes an option. There are cost-savings because overhead costs are proportional to the amount of office space needed.
- For society, the reduced commuting results in reduced pollution and reduced congestion on the transport system.



Working from home sounds wonderful. Discuss with others the possible downsides of such an arrangement. Are there any disadvantages from the employer's point of view?

ICT information sources

Information held on a computer in electronic form can be accessed in a number of ways, according to who should be able to view it. The options are as follows:

- The user, at the computer on which the data is stored, has direct and sole access to the data.
- If the computer is on a network, other users on the network may be given access to the data. The data is then shared data.

What does it mean?

Hot-desking is a system where staff do not have a personal space within an office, but work at any spare desk whenever they come into the office.

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- Data may be put on to an intranet so that it is available to all those within an organisation.
- Data may be published on a website and be accessible via the Internet. This data is then publicly available.

Accessing data that is on a website can be achieved through any connection to the Internet:

- on your PC via a modem or server on a network
- on a mobile phone that has been set up for Internet access
- through your TV.

You may also take a laptop to an Internet café, and the connection at the café may well be through a wireless link.

Communication styles

The heavy reliance on email has meant that colleagues within the same organisation often now do not talk face to face, or even over the phone.

Humans rely heavily on body language and facial expressions as an aid to understanding what someone is saying in a conversation. When these cues are not present, miscommunication is easy. To help combat misunderstanding, and to compensate for the lack of such body and facial cues, 'emoticons' have been developed and are now in common use.



Further research – emoticons

Interpret these emoticons. Compare your understanding of them with that of other people.

8<)	:-)	:-D	:'-)
;-)	:-T	8-]	^5
:-(:(:-<	:'-(
>:-<	:-S	:-\	:-X

In some applications, the text versions are replaced with small graphic images. Investigate the graphical equivalent of the emoticons listed above.

How ICT can be used to improve skills and knowledge

This unit has identified the significant impact that new technologies have on individuals working in organisations. One thread that has run through all of this has been the increased pace of change and the resulting need for individuals to have up to date skills to perform effectively within an organisation.

This section considers how to assess the needs of individuals, how training might be delivered and, in particular, the features of ICT as a delivery mechanism in learning programmes.

Assessment of need

Without understanding the needs of individuals, it is impossible to offer effective training and development opportunities. There are a number of techniques that can help this process.

Most staff are subject to routine appraisal interviews. These may be scheduled to take place annually or, possibly, more frequently. At these interviews, usually conducted by the manager of the individual, past performance is discussed, and consideration is given as to what training and development is necessary. Typically, these personal development plans are written down so that they can then be referred to at subsequent meetings. This serves as a check on progress. Future salary increases, bonus payments or promotion prospects may be linked to the achievement of any targets set.

The individual may be asked to perform a self-assessment activity prior to such an appraisal meeting. This is intended to identify strengths and weaknesses and, thus, to highlight development needs. The assessment will probably be partly based on the needs of the job as stated in the job description, but should also be documented as a personal development plan.



Use the Internet to identify a job that you might consider applying for. Look at the job description and make a list of what skills you already have and what skills you would need to develop before you might be considered for the post.

Delivery mechanisms

Fifty years ago, people learnt new skills in two main ways: they could serve a form of apprenticeship, learning how to do their job by observing

and working with experienced colleagues; or they could attend formal classes at schools, colleges or universities to gain relevant qualifications and then take a job. For some people, there was a mixture of the two, say with one day a week in college while learning 'on the job'.

In the last 50 years, the way the workforce is trained has undergone many changes, not least due to the option to use ICT as part of the delivery:

- As the traditional apprentices disappeared with the jobs tool-making, for example – modern apprenticeships have taken their place.
- Open University courses also offer the chance to gain a higher-level qualification through distance learning.

People can be working and learning at the same time. The range of options includes such things as:

- onsite training provided by an employer, and customised to suit the individual's job needs
- part-time study, e.g. at evening classes or by day release
- full-time study
- CD-ROM training
- online web-based learning.

It is important to consider the circumstances of the individual, as well as what the employer needs and is willing to finance:

- How flexible is the content of a course? Can individuals pick and choose what they learn? Can an employer specify what is to be covered, or is it determined by some external examining or specialist body?
- What does it cost to train an individual? Does the delivery method make it expensive or cheap? One-on-one training is labour intensive and very expensive. Larger classes are less expensive but may not suit all learners.
- How flexible is the course in terms of timing? Can the course be delivered when the individual wants to learn?
- How flexible is the course in terms of location? Can the course be delivered wherever the individual wants to learn?
- What support is available to the learner from the tutor or other learners.

ICT delivery mechanisms

For many, traditional methods of learning could still be the best model. But ICT offers other forms of learning that might be used instead. For example, self-study of material provided on CD-ROM, or using a webbased course, has a number of advantages for you as a learner:

- You can work through the material at your own pace.
- The learning can be done at a time and place that is convenient to you.

This training method is the least labour-intensive (for trainers) and so is a relatively cheap option.

There are disadvantages though:

- Learning by yourself is not as much fun as learning within a group. You have no one to bounce ideas off.
- Learning without the availability of a teacher or tutor can mean you lack support. There may be no one to explain something when you get stuck.
- The quality of the material becomes very important and it has to be engaging so that you are not bored by it.
- To maintain the course, you need self-discipline.



Find a number of prospectuses from your own centre, and others in the area, and identify example courses that show the different ways that you could learn new things. Also look at educational publishers' lists and at what is available in local bookshops.



Case study

Peterson's Music

You can use this case study to practise the skills that you will need for your assessment tasks.

Peterson's Music is celebrating its 50th anniversary. It is a family firm and has one large shop in the high street. It started selling records and sheet music in the 1960s and grew very rapidly in its first 20 years. Profits and turnover were quite stable in the 1990s but are now beginning to fall.

The original owner of the shop, George, has a daughter and a son, who want to stay in the music business but realise that the shop at the moment could not support them both. Neil is 22 and has just completed an HND in Business. Nell is 20 and plays keyboard in a local group – she is following a part-time IT degree. They have both always worked in the shop at busy times. Mr Peterson employs a part-time book keeper, who keeps the accounts. The book keeper uses Sage (an accounts package) on a standalone machine. Neil and Nell share another family PC, which they have used for homework and games. This second machine has Internet access (not broadband) and a range of peripherals and software.

Their current range of goods includes CDs, music books and a limited range of musical instruments – mostly keyboards and cheap guitars. They have a number of regular customers, whom they know by sight.

Neil and Nell had a discussion with their father and came up with the following new objectives for the business:

- Establish a base of known regular customers and keep them committed to buying from Peterson's.
- Increase the number of new customers visiting the shop.
- Use ICT to make sure the shop is run efficiently.
- Increase profits, so as to be able to support all of the family.

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- Explore new ways of doing business.
- Grow the business without taking on any more staff.

Activities on the case study:

- Explain to George in what ways the shop could use ICT, and possible internal and external factors that could force them to use it. Include examples of what each way could be. Make sure you include at least one example each of the following ways of using ICT:
 - presenting information
 - manipulating information
 - managing information
 - communicating with ICT.
- 2 Discuss this with other students. Between you, try to identify and describe in detail the three most important immediate changes that you would recommend; for each one, describe the benefits as well as the possible disadvantages.
- **3** In a group, prepare for a meeting with the company by identifying and listing all of the different ways that using ICT can affect the working environment of any organisation. Identify three ways in particular that could have a negative impact and, for each one, describe how you could ensure that this negative impact is reduced or eliminated.
- 4 George is impressed by your arguments, but is a little reluctant. It is important that he understands what the impact of these changes might be and how it might affect the shop and the people working in it. From the list you provide for Activity 3, pick out the four ways that might be particularly relevant to Peterson's Music. Describe

these in more detail, together with the possible impact each might have. Structure your response carefully by describing the impact on both the shop's capacity to do work (faster, more efficient etc.) as well as the impact on the complexity of the job and what this might mean in terms of retraining.

- 5 Create an 'actions list' that will help the organisation do the things it needs to do in terms of making the working environment of the shop safe and healthy.
- 6 Research what new technologies, emerging now or that might emerge in the next five years, could have an influence on the way that music shops operate or what products they might want to sell. Identifying future trends is quite difficult and different people may have quite different ideas about what changes will take place.
- 7 Make a list of potential new skills that George, Nell and Neil need to acquire and, for each one, identify possible ways that they might learn these new skills. Assume that Neil will be responsible for maintaining the hardware and software systems.
- 8 Assuming that George has no ICT skills, make recommendations to him about the best types of learning programme for him – also note the benefits and disadvantages of each type of learning. You may need to research in more detail the courses and training available locally and their typical student intake.
- 9 Neil does have some ICT skills because he followed various ICT courses as part of his HND in Business. Create a questionnaire that he can use to help clarify what his existing skills are and what gaps he has.



Assessment tasks

The assessment tasks in this unit are based on the following scenario:

3 Star Fitwear is a medium-sized business that manufactures and distributes sports clothing. The new manager knows that the company could make much better use of ICT. He is ambitious and wants the business to sell more goods and make a larger profit. In order to do that he believes that he should encourage all his employees to improve their skills, and that they should work in a pleasant and productive environment.

You have been taken on as a consultant to guide the company through the changes ahead. This will involve you in doing some research about other companies. You should report on how they use ICT and the impact it has on individual workers and the organisation as a whole.

To obtain a Distinction in this unit you will need to achieve **all** the Pass, Merit and Distinction criteria in the unit and have evidence to show that you have achieved each one.

How do I provide assessment evidence?

Your evidence can be presented in any suitable form, such as written reports, presentations, web-based or verbal explanations. If you make a presentation, include speaker's notes, and print off both slides and notes.

All your evidence should all be presented in one folder, which should have a front cover and a contents page. You should divide the evidence into five sections corresponding to the five tasks.

Task 1 (P1, P2, M1, D1)

This task looks at how organisations are affected by ICT and how they use technology to meet their business objectives.

Describe in general how organisations use ICT. You should write something under each of these headings:

- Presentation
- Manipulation of information
- Communication
- Managing information.

Explain the reasons why organisations use ICT. You should include at least two internal factors and at least two external factors.

Choose one particular organisation. It could be in the real world or could be presented to you as a case study. Investigate how it uses ICT and explain why it uses ICT in the way it does.

To work towards a Distinction you should do some more work on the use of ICT made by one particular organisation:

- You should suggest three changes that could be made in the way the organisation uses ICT.
- You should, outline the benefits of each change that you propose. If there are any disadvantages then list those as well.



Assessment tasks continued

Task 2 (P3)

This task looks at the impact of ICT on individual workers. You should think about people who use ICT to support their work, rather than technical users such as system administrators or programmers. You can discuss this in a general way, but you also need to include at least one example of someone who works with ICT. This person could be a real person you have met, or could be described to you in a case study.

Describe at least two ways in which the use of ICT helps an individual to be more productive. Describe at least two ways in which the use of ICT could make an individual's work more complex.

Task 3 (P4, M2)

In this task you should look at the working environment and how it is affected by the use of ICT. As in Task 2, you can discuss this in a general way, but it would be helpful to include real life examples from a number of organisations.

Describe four ways in which ICT can affect the working environment of an organisation.

Identify and consider three aspects of the working environment that may cause concern. Discuss ways in which the negative impact could be reduced.

Task 4 (P5, D2)

In this task you will be looking at recent trends in ICT. New technologies will have appeared since this book was published and you should try to find out about them.

Describe recent trends in ICT and how they might be useful to organisations.

To work towards a Distinction you should think carefully about how organisations can deal with technologies that are changing all the time:

- Describe how an organisation can make the best use of new technologies.
- Outline any negative effects of new technologies and describe how an organisation can minimise these.

Task 5 (P6, M3)

This task looks at how individuals can learn throughout their working life.

- Describe how an individual can identify what they need to learn in order to use ICT effectively.
- Describe the different ways in which individuals can develop their ICT skills.
- One way in which someone can develop their skills is by using an ICT-based learning package. Compare this method of learning with traditional methods.

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