

Block 1 Part 1 Living in a digital world

This item contains selected online content. It is for use alongside, not as a replacement for the module website, which is the primary study format and contains activities and resources that cannot be replicated in the printed versions.

Part 1 Living in a digital world

Contents

Introduction	3
1.1 Computers and communications: from rarity to ubiquity	5
1.1.1 The telephone	5
1.1.2 The computer	6
1.1.3 The networked world	7
1.1.4 Conclusion	11
1.2 Some aspects of our digital world	12
1.2.1 Business	12
1.2.2 Communities, information and entertainment	15
1.2.3 Public information and services	18
1.2.4 Security and risk	20
1.2.5 Communicating on the move	21
1.2.6 Conclusion	21
1.3 Participating in a digital world	22
1.3.1 Netiquette: respecting others online	22
1.3.2 Studying and working online	27
1.3.3 Ethical and legal considerations	29
1.3.4 Copyright	30
1.3.5 Good academic practice	31
1.3.6 Conclusion	32

1.4 Online safety	33
1.4.1 Malware	33
1.4.2 Spam	34
1.4.3 Hoaxes	36
1.4.4 Phishing	36
1.4.5 Conclusion	39
Summary	40
Answers to self-assessment activities	41
References	42
Acknowledgements	43

Introduction

Welcome to the first block of TM111 *Introduction to computing and information technology 1*.

As you study Block 1 *The digital world*, you'll experience and investigate a wide range of aspects of the digital world. Many of the things we enjoy – such as music, images, email and social networking – are based on digital technologies, and you will see how advances in these technologies have led to them playing an increasingly significant role in our lives. You will examine some practical examples, and explore some of the issues and debates that surround the use of digital technologies in a range of everyday situations. Block 1 also introduces some of the key skills for study, including communication, numeracy, practical and professional skills, and digital and information literacy (DIL) skills, to help you become an effective learner.

Part 1 *Living in a digital world* explores what is meant by the 'digital world' in terms of the technologies involved, and introduces some of the legal, social and ethical considerations. Part 2 *The evolving computer* discusses how computers have developed since the early days to the present time when computers are 'ubiquitous' in that they are everywhere around us. The idea of using binary numbers to code digital representations is also introduced. Part 3 *Digital media* looks at how images and sound are represented as binary numbers in computers and you will use a sound editing program, called Audacity, to record and manipulate sound. Part 4 *A world built of data* takes the idea of data representation further, exploring the relationship between data, computers and humans. Part 5 *Weaving the web* explains how the web works and includes hands-on work building simple web pages using HTML codes and editing tools. Part 6 *Crossing boundaries* looks at

human–computer interaction (HCI) as the shared boundaries between the user and the computer, and introduces you to concepts such as 'usability' and 'accessibility'. You will start your personal and professional development planning (PDP) at the end of Part 6. You will then complete and submit your tutor-marked assignment (TMA).

Some of the topics you study over the next few months may be familiar to you, but others will be new. I hope that you find most, if not all, of them interesting and enjoyable.

The module website

The module website includes an online study planner which will guide you through the printed and online study resources and help you to plan your work. You should visit the module website *before* continuing with Part 1 and *before* starting each subsequent part.

Some activities require you to be online and this will be indicated by an icon (as shown) in the margin. Words in **bold** are included in the glossary, which you will find on the module website. If you haven't already done so, make sure you look at the TM111 *Module guide*.



Introducing Part 1

My job in this first part of TM111 is to start you off on the digital journey that you'll be making over the next few months. You will learn a little about the historical development of communication technologies and computers and their role in today's society, and you will consider examples of digital technologies in the world around you and their influence on

your life. However, this part merely introduces some of the key ideas; you will study them, and others not mentioned here, in greater depth later on.

At this stage you are probably wondering what we mean by the title of Block 1 *The digital world*. To begin, you'll need to know that a digital technology is any technology based on representing data as sequences of numbers. This is a fundamental idea and you will learn much more about it as you work through TM111. In this module, the term *digital world* refers to the influence of computers on the world, in a wide variety of forms, linked by communication networks.

Most of the uses of technology that you'll consider will be legal and harmless. However, you will also look at some examples that subvert laws and the rights of others. Other examples move into the worlds of crime and terror where information is transmitted that others want to intercept, control or suppress. Effective participation in the digital world therefore requires you to become aware of many technical, social and ethical pitfalls, as well as some of the ways you can avoid them.

Activity 1.1 (exploratory)

How digital is your world? You should now complete the 'How digital is your life?' quiz which you will find on the module website. Note: there are no right or wrong answers in this quiz.

Comment

As I said above, there are no right or wrong answers to this quiz, so some of the questions may not seem relevant to you. As you study TM111 you will learn about new ideas, develop new skills and become more confident. You might like to return to the quiz towards the end of TM111 to see whether your responses to the questions have changed.



1.1 Computers and communications: from rarity to ubiquity

The theme of this section is the development of **digital technologies**, from the physically large and highly expensive equipment of the 1950s to the omnipresent **networks** and computer-based devices upon which our digital lives are founded today. In this section I will:

- compare the development of the computer to the development of the telephone
- describe some of the digital technologies that form an integral part of many of our lives
- introduce the term *information society*.

1.1.1 The telephone

In the 1950s, telephones represented the cutting edge of technology. However, they were not only large and expensive to purchase but also inconvenient to use; if you wanted to make a call over a distance of more than fifteen miles, you had first to call the operator who would then make the connection.

Telephones were also expensive to use. In the UK, calls were charged in units of three minutes, each unit costing the equivalent of between 2 and 19 pence in decimalised currency. (In comparison, in 1955 a pint of milk was cheaper at about 3 pence.) Few people had a home telephone and even fewer made long-distance calls so most people made use of public telephone boxes (Figure 1.1). The high cost of using a telephone ensured that anyone who had one tended to use it infrequently, and then only for short calls.



Figure 1.1 Inside a public telephone box

In 1959, the General Post Office, which ran almost all UK telephone systems at the time, introduced subscriber trunk dialling (STD). This advance in technology allowed users to make long-distance calls directly, without an operator, and to be charged only for the

actual duration of the call. The telephone became easier and much cheaper to use; as a result, more people began to use it and for longer calls.

The first ever public call on a mobile phone was made in 1973. The call was made on a Motorola device resembling a brick at 22 cm long, weighing about 1 kg and with a talk time of just over 30 minutes.

Over time, the telephone has become part of the background of our lives. Nowadays it is extremely unusual to find someone who has neither a home telephone nor a mobile phone. Just as the telephone changed from a status symbol to become simply another piece of the modern world, so the computer has made a similar transition.

1.1.2 The computer

There were very few computers in the 1950s, and those in existence were treated as objects of wonder with almost mythical powers. They were nothing like the computers of today, as you'll see in a later part. For one thing, they were huge, such as that shown in Figure 1.2 with Grace Hopper, inventor of the computer language COBOL (COmmon Business-Oriented Language). They were also delicate and consumed a lot of electricity, wasting much of it as heat.



Figure 1.2 Grace Hopper beside a 1950s mainframe computer

Nowadays, however, a computer is just another item stocked in supermarkets. And as computers have become cheaper and smaller, they have been incorporated into a kaleidoscopic range of devices that bear no resemblance to what was once thought of as a computer. Powerful computers now sit at the heart of objects as diverse as smartphones and games consoles, cars and vacuum cleaners. The cost of computer power continues to decrease, making it possible to incorporate computer technologies into almost any object, no matter how small, cheap or disposable. And these **smart devices** are 'talking' to one another – not just within a single room or building, but across the world via the **internet**, using the **world wide web** (see Box 1.1). Thus even as the computer vanishes from sight, it becomes vastly more powerful and ever-present – to use a term you'll become very familiar with, it is now **ubiquitous**.

In the smartphone, two previous separate technologies, computers and the mobile telephone systems, have become combined in one device. This **convergence** of computing and telephone technologies has resulted in new goods and services for people

to buy and use. For example, many people who were not previously interested in computers are happy to take photographs on their mobile phones and share them. In this situation, the computer in the phone handles the processing of the photograph and enables it to be sent by email or uploaded to social media.

Activity 1.2 (exploratory)

Can you think of another technology that has made the transition from novelty to commonplace, like telephones and computers?

Comment

There are many possible answers to this question. I thought of televisions; there used to be only one per household, but today homes often have more than one television – and television screens are available in public spaces such as health centres, hotels and even in parks. Also, people can watch television on their computer or a tablet through a broadband connection.

Box 1.1 The internet and the web

You will come across the terms *internet* and *web* a lot in TM111. Although in everyday life people tend to use these terms interchangeably, in reality they are two separate (though related) entities.

The internet is a global network of networks: an *internetwork* (hence its name). It is the infrastructure that connects computers together. At first written with an upper-case 'I', it is now usually seen with a lower-case 'i'.

The web (short for *world wide web*), on the other hand, is a service that links files across computers, allowing us to access and share information. Thus the web is a software system that has been built upon the **hardware** of the internet.

Apart from anything else, this means that it is technically incorrect to refer to 'searching' or 'browsing' the internet. When you carry out an online search, you are in fact searching the web!

1.1.3 The networked world

Networks and the internet

As a result of advances in **information and communication technology (ICT)**, our notions of time and location are changing – distance is no longer a barrier to commercial or social contact for those of us connected to suitable networks. Some people may find it difficult to imagine not having access to the information and services that play a crucial part in their daily lives. Others may feel that they have no part to play in the digital world because their network access is very limited or even non-existent. Some simply don't care about the digital world, viewing it perhaps as a waste of time. Yet whether we are aware of it or not, digital information is flowing constantly around us.

Consider a computer that is connected to the internet – the one you intend to use in studying TM111, for example. This may be a computer you use at home, in a library or at work; you may use it on the move or in a fixed location. Whatever the case, this computer is part of a complex system consisting of wires and optical fibres, microwaves and lasers, switches and satellites, that encompasses almost every part of the world. The oceans are wrapped in more than a quarter of a million miles of fibre-optic **network cable** with several strands of glass running through it. Each of these strands can carry thousands of simultaneous telephone conversations, a few dozen television channels, or any of a range of other forms of digital content (such as web pages).

This modern communications network enables us to use a mobile phone in the depths of Siberia or take a satellite telephone to the Antarctic (Figure 1.3), watch television in the middle of the Atlantic, do our banking on the train, or play games with a person on the other side of the world. It is one of the greatest technological achievements of the last thirty years and it is so reliable, so omnipresent, that we very rarely stop to think about what actually happens when we dial a telephone number, click on a web link or switch TV channels. Or, rather, we tend not to think about it until something disrupts the network – whether it be a widespread problem such as a power cut, or something more localised such as finding ourselves in a rural area with slow broadband access or no mobile phone signal.



Figure 1.3 Using a satellite phone in the Antarctic

Information, knowledge and learning

The end of the twentieth century and the beginning of the twenty-first century are often compared to other historical periods of great change, such as the Industrial Revolution, because of the huge technological changes that are happening in many areas of our lives. These developments are taking place in conjunction with correspondingly large social and economic changes, often characterised by the terms **information society** and **network society**. Policy makers frequently refer to such terms when driving forward changes in the technological infrastructure. Politicians often refer to the inevitability of technological change in our information society and stress the need to be at the forefront of these changes in order to secure future prosperity. The development of the broadband network infrastructure, making public services available online, and equipping schools and local communities with computers are examples of such changes.

Another term you might have encountered is that of the **knowledge society**, which refers to the way that new information systems can transform human societies. Included in the

knowledge society is the idea of the ‘learning society’. The pace of change is so rapid nowadays that learning can no longer be confined to our school years and early adulthood. Everyone must continue to learn throughout their adult lives in order to benefit from the economic opportunities that rapid development makes possible.

Activity 1.3 (exploratory)

Can you think of an example where changes in technology have resulted in changes to your work, social or family life? Have those changes improved your life? Have they created any problems?

Comment

The biggest change for me has been in my ability to work from home. I’m currently sitting at home typing this text on a computer whilst listening to some music, which is also stored on the computer. I’ll shortly email my document to a colleague, who will be able to read it a few seconds later. I can also share my document with colleagues through an online storage system.

Being able to work from home has its advantages and disadvantages. I find it easier to concentrate when I’m working at home, rather than in a busy office space shared with a dozen other people. It also saves me the time and money that used to be spent on travelling. On the down side, the boundaries between my home life and my work life have become very blurred, as my family will confirm.

The rise of texting and messaging

You might wonder about how these technologies change the way we live, work and relax, but sometimes it works the other way around. Unintended uses sometimes develop alongside the intended uses of emerging technologies in our information society. A classic example is the text-messaging facility on mobile phones, often referred to as **SMS** (which stands for short message service). This was originally a minor feature designed to be used by engineers testing equipment – it was not expected to be used by phone owners at all. Yet in the first decade of the twenty-first century, SMS messages were one of the most profitable parts of the mobile phone business (International Telecommunication Union, 2006). SMS resulted in a whole new method of communication and form of popular culture, different ways of interacting with radio and television, and even a new language form: texting.

Income from SMS messages peaked at around US\$104 billion in 2011 (Associated Press, 2012). In more recent times, **instant messaging (IM)** ‘apps’ used on smartphones, such as WhatsApp, Snapchat and Telegram, have overtaken SMS in popularity. By 2015, the IM company WhatsApp was handling 30 billion messages every day, compared to the 20 billion SMS messages sent daily (Evans, 2015). This difference in usage is partly because there is no extra cost involved in using IM services. SMS messages can be expensive on some contracts and require a mobile phone signal, but they are still in use. Multimedia messaging services (MMS) allow for text, audio and images to be sent via the mobile phone signal. The total number of SMS and MMS messages sent in the first three months of 2016 was 24.1 billion, a decrease of 1.8 billion messages (6.8%) compared to a year previously (Ofcom, 2016). These services and applications are blurring the boundaries between texting and online communication.

Note: 'billion' is a word that in the past had different meanings in the UK and the USA. However, the two countries now agree that a billion is one thousand million (1000 000 000), and TM111 will follow that convention.

Study note 1.1 Interpreting charts

A bar chart is a way of representing numbers pictorially and can illustrate patterns or trends in the data. In a bar chart, the numerical values are represented by the height or length of the rectangles. Their particular strength is enabling us to make comparisons. The chart in Figure 1.4 represents the percentage of internet users who used instant messaging in 2005 and in 2014 according to age group.

All charts and graphs follow a set of conventions. The charts should include a title explaining what is shown or being represented. The two values being described in Figure 1.4 are the percentage of internet users and the age group. Each axis should be labelled clearly to indicate what units are being used, and have a marked scale. In this example, the vertical axis represents percentage of internet users on a scale of 0% to 90% and the horizontal axis shows the age group.

As with all types of graph, it does not offer any explanations about why the data is how it is. You will have noticed that use varies by age group and that there has been a considerable increase in use over time across all age groups.

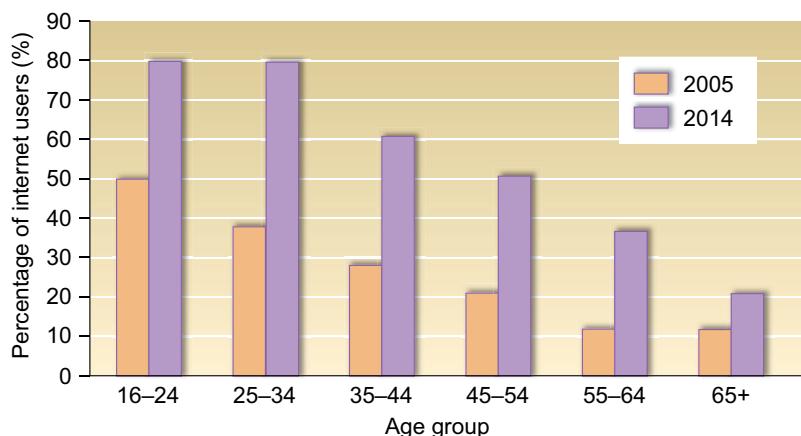


Figure 1.4 Weekly use of the internet for instant messaging, by age group: 2005 versus 2014 (Source: Ofcom, 2015)

Activity 1.4 (self-assessment)

- Study the chart in Figure 1.4. Which age group shows the smallest increase in the percentage of internet users who instant messaged between 2005 and 2014?
- Which age group shows the biggest increase in the percentage of users between 2005 and 2014?
- Can you offer any explanation for the increase in use amongst all the age groups?

Note: as in all the printed parts of TM111, answers to self-assessment activities are provided at the end of the part.

Study note 1.2 Maths skills

If your maths skills are a bit rusty, then you may wish to refer to the *Using numbers* booklet which provides information on various mathematical concepts, including percentages.

Study note 1.3 Making notes as you study

When you have finished reading a section of a part, it can be useful to take time to check whether you've understood the main points. This is also an opportunity to go back over some of the relevant sections and make some notes. The purpose of making notes is twofold: to check that you've identified the main points from a section and to check your own understanding. If you just read passively, you risk losing concentration. Extracting the main points from a piece of writing and then writing them as notes in your own words is the best way of making sure that you have understood.

An effective method for making notes is to start by skim-reading (a quick glance through to get an overview and some idea of the main points) and then re-reading the material more thoroughly, underlining or highlighting the main points as you go along. Using these underlined or highlighted notes, you can then summarise the main points by making a list using some of your own words.

Notes can take different forms; some people like to make linear notes with bullet points, and some others create spray diagrams. The choice is yours. There are also note-making apps that you can use when you are studying online material. You should find that developing your note-taking skills will help you to understand and remember key ideas. You will find further advice on note-making and the different types of notes you can use on the module website.

1.1.4 Conclusion

In this section, having briefly considered the rapid development of computers, I outlined some of the ways in which digital technologies pervade the world around us, giving rise to the social and economic changes that characterise our information society. The concept of the digital world is a key one in TM111, and in the next section I'll try to give you a better idea of what it involves.

1.2 Some aspects of our digital world

In the previous section, I introduced the concept of a digital world; in this section, I will outline some key aspects of such a world. I will look at how it affects business, information, entertainment, public services and communication. Many of the ideas you meet here will reappear several times during your study of TM111.

One of the things you may notice while studying TM111 is that some of the examples you read about no longer exist, or are nothing like as important as when the material was written. This is inevitable, and you shouldn't be concerned by it; your focus should be on the general principles, which remain valid. As an example, some companies you read about may cease to exist, and some may be more or less prominent. Yet the likelihood is that although companies come and go, there will still be ways to share photos (as Flickr and Google Photos allow at the moment), to edit documents online (as is possible with Microsoft Office 365 and Google Docs), to store files online (with file-hosting services such as Dropbox), and so on.

1.2.1 Business

Financial services

Every time you use a debit or credit card in a shop, the shop till communicates with a card terminal that transmits your identification details from your card to your bank or credit card company for verification. Your balance is then adjusted according to your purchase. A similar chain of events is initiated if you shop online (buying a plane or train ticket, perhaps) or over the phone (when buying a cinema ticket, for example). Many banks also provide online banking services, reducing the need for customers to visit a branch.

Automated teller machines (ATMs) allow you to check your bank balance and withdraw cash wherever you are in the world. In each of the above situations – using a debit or credit card, shopping or managing your money online or over the phone, or using an ATM – the machines involved are connected via a network to a central computer which has records of your account in an electronic filing system known as a **database**.

Financial services have undergone huge changes in recent years as a result of developments in the digital technologies driving them. The examples just described show how convenient and accessible such services have become. Yet at the same time, issues of identity and security have become a concern. New online ways of communicating have also created new types of crime, including identity theft and digital financial fraud. In turn, these problems have fostered the development of new security industries that try to inform us and sell us solutions to reduce the chances of us becoming victims of online crime. Also, this move towards online services means that banks have closed many branches, leading to job losses. This is particularly difficult for customers who prefer to use branches, especially those living in rural areas.

Commerce

Advances in digital technologies have led to changes in many areas of commerce, with some existing kinds of business being transformed by the opportunities these developments offer. One of the most obvious changes is the emergence of retailers such as Amazon, which at one stage was entirely online with no physical shop that customers can visit. Yet the internet not only benefits the largest companies, but also allows even the smallest retailers to advertise their services to a global audience. Specialised companies can flourish by harnessing the internet's immense reach to deliver to potential customers. Of course, this growth has resulted in casualties in traditional (sometimes called 'bricks and mortar') retailing. High-street shops specialising in items such as books, DVDs, music and games have all lost business to online retailers. This has driven some shops out of business, but a number of them have also opened successful online stores. Online retailers have lower costs – they don't pay expensive high-street rents and can easily be based in countries with low tax regimes – and they can pass these savings on to customers. There are other concerns about these large online retailers, such as the employment terms and conditions of warehouse workers.

Although the low costs offered by online stores can be very attractive to customers, they might be counterbalanced to some extent by the less immediate and less tangible nature of the shopping experience. However, online retailers try to make up for this by providing a variety of services that reassure and inform their customers. One such service is the tracking of goods online – though this is a development that can produce its own frustrations, as illustrated by the cartoon in Figure 1.5. Having bought a new computer a few years ago and tracked it on its way from the factory in China to my home, I can identify with the feeling expressed! Interestingly, since 2015, Amazon has been setting up 'bricks and mortar' shops including one in London in 2021.

ONLINE PACKAGE TRACKING:

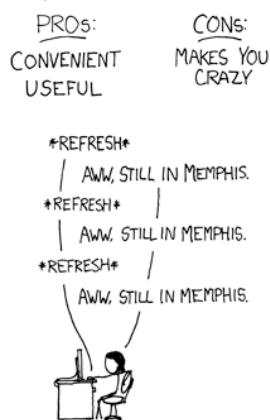


Figure 1.5 A light-hearted look at the pros and cons of online package tracking

Activity 1.5 (exploratory)

Add some more entries to the following table of advantages and disadvantages of online shopping. Can you think of ways in which online retailers may try to address the disadvantages?

	Advantages	Disadvantages
Buyer	More choice Can often track goods	Can't try goods (e.g. shoes, clothes) first
Seller	No need for a physical shop	Reliant on delivery services

Comment

I thought of the following, but you may have come up with others.

	Advantages	Disadvantages
Buyer	More choice Can often track goods Often cheaper than a local shop Some items can be downloaded immediately after buying	Can't try goods (e.g. shoes, clothes) first Harder to return goods if faulty Harder to get help and advice before or after buying May be worried about online fraud
Seller	No need for a physical shop Lower running costs Don't need to keep everything in stock – can arrange delivery from suppliers Can supply music, books, software, etc. for download rather than having to supply a physical item	Reliant on delivery services Likely to get more returned goods Need to respond to email or telephone queries Some potential customers reluctant to buy online

Online retailers may try to address the disadvantages listed above in various ways. For instance, they might provide:

- free collection of returned items
- links to online reviews of products to help advise prospective buyers
- telephone helplines
- support forums to help customers before and after buying
- advice on how to shop safely online.

As well as direct retailing, other types of businesses have also moved online – auction sites such as eBay fall into this category. Some online businesses are less conventional,

and as a result it's often harder to see how they find the money they need to survive. For example, there are many collaborative projects that produce free products including **software**, online encyclopedias and educational resources. These often rely on volunteers contributing their time, with money being provided by advertising, sponsorship or donations.

Work

Technology has changed the way that other businesses operate too. Greater quantities of information are exchanged between numerous locations over public and private networks. Vast amounts of data are stored on computers and accessed remotely from a variety of devices. Many companies now use **data centres** or centralised groups of networked computer servers that specialise in the storage, processing and distribution of large amounts of data.

Just as individuals buy from companies online, many companies now sell to each other online as well, for the same reasons of reduced cost and wider choice that attract individuals to online stores. Manufacturing tasks that used to take days can now be completed in minutes using computer-operated machine tools working in automated production lines.

The way we use technology has also affected our individual working lives. For example, the role of travel agents has changed as more people book their holidays directly from the vendor by going online. Some companies have responded by reducing their number of employees, while others have retrained their staff to provide more specialised services to their customers. More generally, many people working in an office environment are expected to learn how to use new software applications in order to do their jobs.

In this module, you will explore some of the roles that have emerged within these industries. You will also consider the job market and how technology has resulted in changes to the recruitment process. If you are studying TM111 to improve your qualifications and progress in your career, you should find this topic particularly relevant to you.

1.2.2 Communities, information and entertainment

Communities

As well as revolutionising the commercial world, the internet has had an enormous impact on the way we communicate. While there are still people in many parts of the world who do not have internet access, many of us have access at home or at work. As a result, we have the opportunity to communicate with others using email, instant messaging and **online discussion groups** (in online **forums**). Existing communities have created new ways of communicating, and new online communities have developed. **Social networking** plays an increasingly significant role in the lives of many people.

The recent pace of communication change has amazed many of us, and there is no reason to think it will slow down. The cartoon map in Figure 1.6 illustrates the relative size and significance of online communities. The first version of this map appeared on the web in early 2007 when MySpace was the most important social networking site and the micro-

blogging site, Twitter, didn't exist. Over time, new online communities may appear and grow and the current ones may decline, or others which were declining may increase in size and importance.

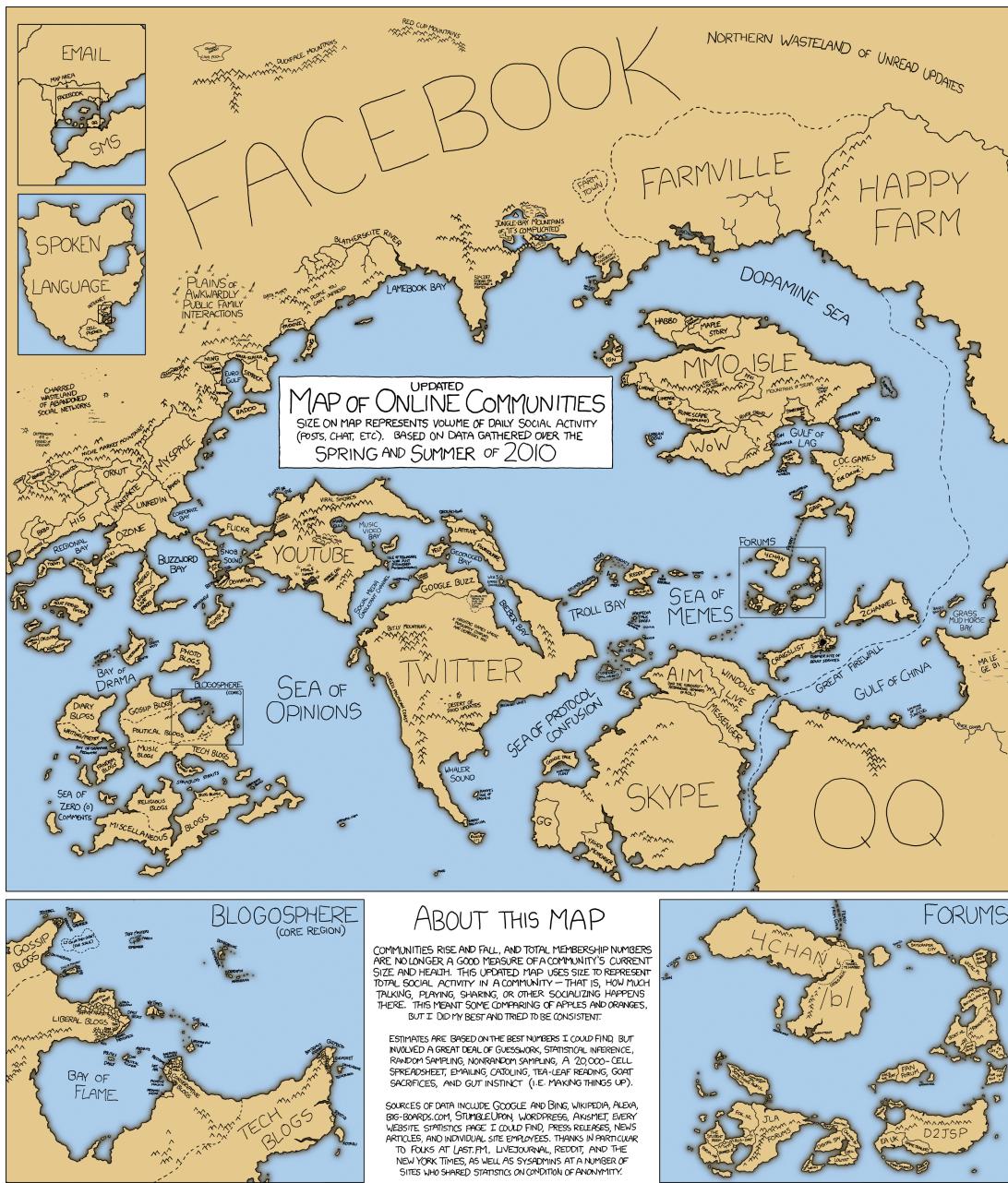


Figure 1.6 One view of the world's online communities in 2010

Information

The internet has had a huge impact on the availability of information of all kinds. Material on the web reflects widely differing viewpoints, from official news bulletins to unofficial rumours, and comes from widely differing sources, from commercial megastores to community groups. Since no individual government, company or person has control over it, the internet has paved the way to unfettered publishing of information of all kinds, raising questions about the authority and regulation of this information. As you will learn in your studies, some governments try to exert control over the information their citizens can access and create, with varying degrees of success.

The widely used online encyclopedia, Wikipedia, for example, contains millions of articles, many of high-quality scholarship – but there are also articles that are of suspect quality and may even be deliberately misleading. Its greatest strength is also its greatest weakness in that anyone with an internet connection can edit its pages. The encyclopedia itself advises users to treat with caution any one single source (whatever the media), or multiple works that derive from a single source.

The ever-increasing volume of online information available on the web means it is important to think critically about what you find, especially if you are going to use it for study or work purposes. You will be learning about how to find and evaluate information online throughout your study of TM111 as these are important digital and information literacy (DIL) skills. The Library website has useful resources and activities that could help you evaluate whether the information you come across during your studies is up to date and reliable.

Entertainment

The world of entertainment is constantly evolving as new ways of creating and distributing the media we watch and listen to are developed. Digital broadcasting has changed the way we experience television and radio, with increasingly interactive and participative programmes. Digital cameras, printers and scanners, together with desktop publishing and photo-editing software, enable greater numbers of people to experiment with image production, while online image- and video-sharing sites allow anyone with access to a relatively basic mobile phone or digital camera to share photos and videos with the rest of the online world. New digital technologies have also been at the forefront of changes in the production and distribution of music, and computer gaming has developed hand in hand with the evolution of graphical interfaces.

However, our increased exposure to digital entertainment has resulted in increased conflict between the rights of the consumer and the rights of the producer of the media. It is now much easier for the products of the media industries established during the twentieth century – film, music and so on – to be illegally copied and distributed in a form that is indistinguishable from the original. **Copyright** holders are taking steps to prevent this by developing a range of **digital rights management (DRM)** techniques that make it much harder to create copies, as well as by trying to persuade users of the benefits of the original product. Such attempts at persuasion can look very threatening, as I noticed on a recently purchased CD that has the following printed on the back cover:

FBI Anti-piracy Warning:

Unauthorized copying is punishable under federal law.

Several questions came to mind when I read this. Does that mean I can't legally put the music onto my MP3 player? Copying from one format to another is legal in the USA but, although the law is under review, it is not legal in the UK at present (although people in the UK are not deterred from doing it). Will I be in trouble only if I distribute copies of the CD to other people? Making copies and distributing them to friends is illegal on both sides of the Atlantic. These are all valid concerns that demonstrate some of the problems surrounding the use of copyrighted material.

Copyright is very much a 'live' issue in the UK and the US at present. There are many other issues arising from this, and it is very easy to make the digital future sound bleak. You have probably heard predictions to the effect that illegally copying media and making information freely available on the web puts whole businesses and hundreds of thousands of jobs in the established media industries at risk. However, as in other areas of the digital world, there are also opportunities for these businesses if they can adapt to the new environment and modify their business models to survive and grow in different directions.

Activity 1.6 (exploratory)

Can you think of any other problems connected with the growth of digital entertainment?

Comment

There are many possibilities. I thought of the fact that the advent of digital television affected even those who didn't particularly welcome it – across the world, analogue signals are gradually being switched off as new digital signals are introduced, as has happened in the UK. This meant that people had to buy new digital televisions as the old analogue versions become obsolete – quite an expensive business! At the time of writing, the government plans to switch off analogue radio soon, which means that people may need to upgrade to DAB (digital audio broadcasting) radio equipment.

You might also have thought of more technical problems, such as how to transmit the large quantities of digital data required for some forms of entertainment – video, for example – in an acceptable time and retaining acceptable quality.

1.2.3 Public information and services

Public bodies such as governments and transport agencies are increasingly providing services online, allowing us to organise various aspects of our daily lives more easily. These services range from simple information displays, which let us check things such as weather forecasts and transport timetables, to interactive sites that allow us to make bookings or queries.

In many parts of the world, medical records are increasingly moving away from paper and X-ray film towards becoming completely digital. This has several advantages, especially in allowing patient records to be easily shared between departments within a hospital, and sometimes more widely with doctors' surgeries and other health workers. In most parts of the UK, doctors and nurses walk around wards with tablet computers and other forms of handheld devices, instead of files and clipboards. In remote rural areas of some countries, doctors can make use of computer networks or even mobile phones to make a diagnosis if they are unable to see the patient in person. However, this is by no means universal, and even where such facilities exist they aren't always available.

Information for travellers is also increasingly being made available digitally: for example, live online updates on road congestion and public transport, and arrivals information in stations and airports. Similarly, most people book plane journeys online – in fact, some airlines now only accept online bookings and will only issue electronic tickets. Many of them require, or strongly encourage, passengers to check in online as well. You can track the locations of aeroplanes in real time using apps such as FlightAware and Flightradar24.

In addition, many countries provide online access to at least some of their government services. For example, you might be able to renew or apply for a passport, book a driving test, claim benefits, or fill in your tax return online. Local authorities also provide digital information services – usually you are able to reserve or renew a library book online, for instance – and there are numerous opportunities to learn online, as you will be doing on TM111.

Changing internet use over time

The Office for National Statistics has been collecting statistics on the use of the internet since 1998 and has produced an annual report since 2006 based on surveys of people in the UK.

The most recent survey at the time of writing shows a huge increase in the use of the internet and social media since their first annual report. These are the key findings:

- The internet was used daily or almost daily by 82% of adults (41.8 million) in Great Britain in 2016, compared with 78% (39.3 million) in 2015 and 35% (16.2 million) in 2006.
- In 2016, 70% of adults accessed the internet ‘on the go’ using a mobile phone or smartphone, up from 66% in 2015 and nearly double the 2011 estimate of 36%.
- Analysis of the use of smart TVs shows that 21% of adults used them to connect to the internet in 2016.
- In 2016, 77% of adults bought goods or services online, up from 53% in 2008, but only up 1 percentage point from 2015.
- Clothes or sports goods were purchased by 54% of adults, making them the most popular online purchase in 2016.
- In 2016, 89% of households in Great Britain (23.7 million) had internet access, an increase from 86% in 2015 and 57% in 2006.

(Source: Office for National Statistics, 2016)

Activity 1.7 (exploratory)

The findings from this survey come from a very reliable source, the Office for National Statistics. Do any of the findings surprise you?

Comment

I was surprised that 89% of the population have internet access (the last bullet point) because this suggests that 11% of households still do not have access. As this section has shown, so much of our world is digital. This raises questions about inequalities in terms of access to goods and services including public services. The inclusion of

statistics on the use of smart TVs suggests that they are becoming a useful way of getting online.

1.2.4 Security and risk

The twentieth century saw a dramatic change in the role of the state in many countries. During most of the nineteenth century, an individual might only have come into contact with the state for the purposes of taxation, marriage and death; at the end of that century and the beginning of the next, however, a series of social revolutions saw the state becoming involved in our healthcare, pensions and education. Unsurprisingly, each of these developments was accompanied by a significant increase in the amount of personal information stored about every one of us. Computer technologies were developed especially to serve the enormous projects involved; IBM became a highly successful company due to its work on censuses in the USA and Europe, whilst the world's first business computer, LEO, was used for a variety of tasks including the calculation of tax tables for the UK Treasury in the 1950s.

With the vast amount of personal information being held about us in various places, it is becoming increasingly important for us to be able to prove our identities – not just for travel, but for other activities such as purchasing expensive or restricted items, paying bills and opening bank accounts. The UK is unusual in Europe in that (at the time of writing) it does not have a compulsory identity card system, despite the fact that identity cards were put in place during both world wars. However, effectively, driving licences, passports and some types of travel pass have become forms of identity card. In several countries, identity card or passport schemes are being upgraded with new **biometric** technologies such as iris or face recognition, which claim to identify individuals uniquely.

As well as the personal information that we know about, there may also exist information about us of which we are unaware. Since the terrorist attacks on the USA in 2001, much of the Western world has become far more security-conscious, and governments and companies alike have developed and deployed technological countermeasures. These range from smart video surveillance systems that can identify an individual in a crowd and track his or her movements, through to the biometric technologies mentioned above, to the searching of databases for suspicious activity.

Activity 1.8 (exploratory)

Can you recall an occasion when you have been personally aware of technological security measures?

Comment

My own experience of security measures at airports involves checking in online and giving details of my own passport and that of my travelling companion several weeks before travelling to mainland Europe. A colleague who visited the USA recently went through a range of airport security screenings. In addition to having his belongings checked, he was photographed at least twice (as well as being under almost constant video surveillance in the airports), had his fingerprints scanned electronically, and was required to fill in numerous online and paper forms.

The promise is that such technologies will make us safer, but could they turn the world we live in into a society strangely reminiscent of the nightmare vision of 'Big Brother' contained in George Orwell's novel *1984*?

As you've seen so far in this section, there is plenty of opportunity for digital information about each of us to be created. Some of this information we might intentionally give out ourselves – on social networking sites, for example. Other information about us may, as described above, be gathered more surreptitiously by various agencies. In general, we have little control over how digital information about us is used or who receives it. We might assume that information gathered legally by a government agency, for instance, will be handled appropriately and used only for our benefit; yet there have been many examples of governments and private organisations 'losing' confidential data by storing or transferring it insecurely. For example, in 2015 the communications company, TalkTalk, was forced to issue a warning to its customers that their data had been hacked and that criminals were using the stolen information to trick people into handing over their bank details.

1.2.5 Communicating on the move

Advances in digital technology have, in a very short space of time, revolutionised the way many of us live our lives. Nowhere is this more evident than in our ability to communicate as we travel. When I first moved away from home, communicating with my parents involved a shared payphone in the hallway or a telephone box at the corner of the street. Nowadays I have a mobile phone with which I can send and pick up emails quickly and cheaply wherever I am. As well as email, my phone enables me to communicate in several other ways – instant messaging and social networking, for example, not to mention voice calls. I can also use the built-in **global positioning system (GPS)** to find out where I am, and can even plot my location on a website to let my friends and family see where I am (or at least see where my phone is).

1.2.6 Conclusion

In this section, you've learned about some of the key aspects of an information society, social networking being one of them. In the next section, I'll outline some ways in which you can participate in online discussions effectively.

1.3 Participating in a digital world

Previously in this part, I've mentioned the rise of social networking – one aspect of our increasingly digital world. You may already communicate online to some extent in your daily life, and while studying TM111 you'll certainly do so as part of an online community of tutors and students. In particular, you'll participate in your online tutor group forum, whose members are your tutor and all the students he or she has been allocated. In a later part, you will look again at the phenomenon of online communication in a variety of forms, and analyse it in some depth.

When we have a face-to-face conversation, we don't just rely on the spoken words to establish the other person's meaning; subconsciously, we are also monitoring the tone of their voice, their facial expression and their body language. Telephone conversations are a little more ambiguous because we can no longer see the other person; email and online discussions are harder again, since all we have is text. It is extremely easy to misinterpret words on a page, so the writer must take great care before pressing the button that sends their message to the world.

What follows in this section is a quick guide to good practice in contributing to online discussions. It should help you to work and socialise with others online – in your studies, your social life and your working life. Much of the content is summed up by the familiar tenet known as the Golden Rule: a concept common to many ethical codes, which simply states that we should treat others as we would want them to treat us. Just as this Golden Rule is relevant to good manners – 'etiquette' – when talking face to face, so it is relevant to online communication. To help us apply it, it has been developed into guidelines for online behaviour called 'net etiquette' or, more commonly, **netiquette**.

Netiquette is intended to make us all think about how we behave online and to make us aware of the effect our words could have on others reading them. These guidelines aren't hard-and-fast commands that you must remember and obey, and netiquette does not encompass every situation you may find yourself in. In fact, it's perfectly possible to obey all the guidance below and still annoy someone. However, netiquette provides a good foundation for your participation in online discussions.

Most of what follows is common sense and good manners. Some of it may be familiar to you, but please take time to read it – and do so especially carefully if this is your first Open University module or if you don't have much experience of using online discussion groups to work with others. There's a big difference between working in an online community and socialising online, so even if you are experienced at the latter, you should find the following material useful.

1.3.1 Netiquette: respecting others online

As children, we quickly learn many rules about how to interact with other people. Some of these rules are common sense, such as 'don't interrupt a speaker' and 'say please and thank you', and are necessary if we are to reduce the likelihood of arguments or causing offence.

Thank, acknowledge and support people

People can't see you nod, smile or frown as you read their messages. If they get no response, they may feel ignored and be discouraged from contributing further. Why not send a short reply to keep the conversation going? This can make a big difference in a small group setting such as a tutor group forum. However, do bear in mind that in a large, busy forum, too many messages like this could be a nuisance.

Acknowledge before differing

Before you disagree with someone, try to summarise the other person's point in your own words. Then they know you are trying to understand them and will be more likely to take your view seriously. Otherwise, you risk talking at each other rather than with each other. You should also recognise that other people are entitled to their point of view, even if you consider them to be entirely wrong.

Make clear your perspective

Try to speak personally. That means avoiding statements like 'This is the way it is ...' or 'It is a fact that ...'. These sound dogmatic and leave no room for anyone else's perspective. Why not start by saying 'I think ...' or 'I feel ...'? If you are presenting someone else's views, then say so, perhaps by using a quotation and acknowledgement.

Other cues

Emotions can be easily misunderstood when you can't see faces or body language. People may not realise you are joking, and irony and satire are easily missed – all good reasons to think before you send a message. To compensate for these restrictions, early internet users came up with the idea of the smiley face – :) or :-) – which then grew into a whole family of **emoticons**.

Small digital images called **emojis** are commonly used in electronic communications, such as text messages and emails, to represent ideas and emotions. Incidentally, the word ‘emoji’ comes from the Japanese term for ‘picture characters’ so, although the word is similar to ‘emoticon’, this is a coincidence. Examples of emojis are shown in Figure 1.7 below.



Figure 1.7 Examples of emojis

Remember that the systems upon which many forums are based only support plain text, so you can't always rely on emojis or fonts and colours to add meaning. Even if you are using a forum that allows so-called ‘rich text’, it's possible that other users will be picking up messages as plain-text emails or as text-message alerts on their mobile phones and will not see your formatting. AND DON'T WRITE IN CAPITAL LETTERS – IT WILL COME OVER AS SHOUTING!

If you read something that offends or upsets you, it is very tempting to dash off a reply immediately. However, messages written in the heat of the moment can often cause offence themselves. It's much better to save your message as a draft and take a break or sleep on it. That gives you a chance to come back to your message when you're feeling calmer and ask yourself ‘how would I feel if someone sent that message to me?’. If you decide it will make things worse, then make sure you edit it before you send it.

The best advice is to try to be aware of your audience before you post. The internet is a global phenomenon; people from widely differing cultures and backgrounds may read what you write online, and what you find funny may be offensive to them. It may take time to work out what sort of ‘audience’ can be found in a particular forum; some are very permissive and allow almost any sort of behaviour, while most (like those at The Open University) will not tolerate bad behaviour or abuse.

Activity 1.9 (exploratory)

Look at the email exchange shown in Figure 1.8. What emotions are being expressed through smileys and typography? Would Jon and Sue still be on speaking terms if they hadn't used these devices?

The image shows four messages in a digital communication interface:

- Message 1 (Jon):** Today at 13:00. From Jon. To: Sue. Re: Files. Content: Dear Sue, I've messed up by overwriting a file you've just edited. I think I've mended the damage, but could you check I did it right? Jon.
- Message 2 (Sue):** Today at 13:05. From Sue. To: Jon. Re: Files. Content: Aaaarrggghhhhhh. Don't do this to me. ;o)
- Message 3 (Jon):** Today at 13:12. From Jon. To: Sue. Re: Files. Content: Sorry.
- Message 4 (Sue):** Today at 13:20. From Sue. To: Jon. Re: Files. Content: :o)))) The page looks OK. No harm done. I had a meeting at 8.15 yes 8.15 today so forgive me if I'm a bit grumpy. Sue

Figure 1.8 Email exchange between Jon and Sue

Comment

In Sue's first reply to Jon she expresses her frustration by typing 'Aaaarrggghhhhhh', but she ends that message with a winking smiley. Jon's reply then says 'sorry' in a very small voice! Sue's final reply starts with a happy smiley to show that everything's OK. She uses a large font when she mentions the annoyingly early meeting time.

I feel sure that Jon and Sue would still be friendly after this email exchange. But I have seen email exchanges between colleagues that had the opposite effect, when the participants didn't take care about how they expressed themselves in their messages.

Moderation of forums

Moderators are forum participants responsible for keeping order. They may have capabilities within the forum greater than those of other participants; for example, they can sometimes add new participants and suspend people who are abusive. They also work to keep the discussions friendly and relevant to the forum. A forum with a moderator is said to be *moderated*. All Open University forums are moderated, and your tutor group forum will be moderated by your tutor. Forums without moderators are *unmoderated* and are generally places where newcomers should tread very carefully. Moderators tend to introduce themselves early on in forum discussions, so it's usually clear whether a forum is moderated or not.

Some other advice

Other useful points to note when you are using a forum are:

- Keep to the subject, and pick the right forum for your contribution.
- Before you write a message, check any rules about what is and is not considered acceptable in the forum. Many discussion forums have rules, aside from netiquette, about things such as links to commercial sites.
- Take a little time to use the forum's search facilities to see if your question or topic has already been discussed or covered in a set of frequently asked questions (FAQs). If it has, you should at least scan the existing messages to see if your points have been addressed.
- Don't feel you have to post immediately. Take your time to see what is being discussed and get a feel for the group you're joining. This very sensible behaviour has the unfortunate name of *lurking*, but is quite acceptable online. If you want to post, many discussion groups have a forum devoted to new users where they can introduce themselves to other readers. These are always good places to get started.
- Try to keep your messages short and to the point. People don't want to read long, rambling messages, especially if they can't work out what response you're looking for.
- Write a concise subject line (title) for your message – people often won't spend time reading messages unless the subject line looks relevant.
- Keep to one subject (topic of discussion) per message. If you want to cover another subject, do it in another message.

- When replying to a message, quoting part of that earlier message can be helpful so that readers can easily see what you are referring to. Add your response *after* the quoted material, not before it. And keep your quotation short and to the point, otherwise the resulting messages will get longer and longer.
- If you ask a question and it is answered, thank the person who responded. It's not only polite, it also shows that the discussion has come to an end.
- If you've reached a point where you disagree with someone and neither of you is going to change your opinion (Figure 1.9), realise the conversation is over, agree to disagree, and move on.

ARE YOU COMING TO BED?

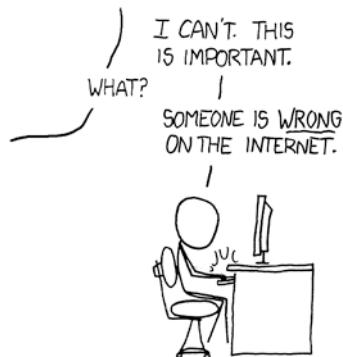


Figure 1.9 Online discussions can become addictive!

1.3.2 Studying and working online

In this section, we will explore some of the online support and resources that are available to you in this module, your future studies and beyond.

Activity 1.10 (exploratory)

Firstly, on the module website, you will find a link to a quiz on netiquette. Use this quiz to test your understanding of what you have studied in the previous section. Then go on to the next activity, which also requires you to be online.



Your tutor group forum

This block is called *The digital world*, and so far in this part and in the TM111 Guide, I have explained a little about this module and introduced some of the technologies and issues we will be exploring more deeply in this module. Now it's time for you to tell other people a bit about yourself. You are a member of a tutor group that consists of several other students and your tutor. You may not have had the chance for a face-to-face meeting, so this is your opportunity to introduce yourself.

Activity 1.11 (exploratory)

If you haven't already done so, post a short message to your tutor group forum, introducing yourself to your fellow students and your tutor. If your tutor group forum is not yet open, you can prepare your posting in advance.

There are no hard-and-fast rules about what to say – all of us have different feelings about what we like to share with others. Some of us will say anything to anyone, some of us are more reticent. Only say what you're comfortable with. Don't worry if you're feeling a little shy – you won't be the only one.

A good start might be telling your colleagues your name and your town. Perhaps you'd like to say if you're employed (and if so, what your job is), if you've recently left school, if you're at home with children or with caring responsibilities, or retired? Is this your first Open University module? How about your knowledge of computers and information technology? Are you a novice in the field? What do you expect to get out of TM111 and why did you choose it? These are just examples – as long as you follow netiquette, it's up to you!



Your digital identity

As we live more of our lives online, so it becomes more important for us to be aware of and, as far as possible, try to manage the information that others can access about us online.

Activity 1.12 (exploratory)

I now want you to explore some library resources on managing your digital identity. Go to the module website and follow the link for this activity.

Comment

You'll learn more about this in a later part but, as a general guideline, before you place any kind of information about yourself on the web you should think about the impression you would like potential employers, new friends, your parents or your children to get of you if they searched for you online. Stories of people being disciplined or even losing their jobs as a result of inappropriate comments or photographs on their blogs or social networking sites show that this isn't a hypothetical situation. For some employers, checking the information that is available online about job applicants is as much a part of the selection process as taking up references.



Activity 1.13 (exploratory)

Enter your name into a search engine and review what you find.



- a. What is revealed about you?
- b. What is revealed about other people with the same name as you? If you have a common name, then it may be hard to tell the difference between you and others with the same name. However, you should be able to get an impression – and possibly even some photographs – of a few individuals who share your name. If you can't find anyone with your name, try looking for the name of a family member or friend. Make some notes on one or more of the people you find.

Comment

- a. My name (Elaine Thomas) is fairly common, so most of the links I found do not refer to me. There was one link to my Open University page, which links to other information about my work. However, when I added 'Open University' to my search, I found many links to presentations I have made at conferences and papers I have written, as well as links to the OU website. Although there are dozens of people called 'Elaine Thomas' on Facebook, I didn't find a link to my Facebook page because the privacy settings mean that it isn't publicly available.
- b. There were several references to people who share my name. These people include an American actor, a German musician, a lecturer in Biochemistry and someone who makes celebration cakes.

This so-called 'ego surfing' or 'vanity surfing' is an interesting thing to do from time to time. Overall, I haven't found anything unpleasant or embarrassing, but I'm old enough for any youthful indiscretions to have happened long before they could have been recorded online. I also have a range of usernames that don't resemble my real name and so aren't easily connected to me. They aren't used for anything nefarious, but I see no reason why I should make it easy for others to find out everything about me.

It's not something to get overly worried about, but it is worth being aware of the impression that others can get by following the trail of your online activities.

1.3.3 Ethical and legal considerations

In using a computer for communications, you have many rights of free expression, but you also have certain responsibilities to respect others. At this stage of your studies you need to be aware of privacy, confidentiality and copyright in relation to online communications. These are the main points you should be aware of:

- An email is generally considered to be equivalent to a private letter, and should not be quoted or forwarded to anyone else without the permission of the original sender. This can be particularly poorly observed in companies (even those whose employees are told to assume that all online communications are for the recipient's eyes only, unless otherwise stated).
- Besides the informal rules of netiquette, most forums have a code of conduct and conditions of use that govern acceptable behaviour. Your use of the online forums provided by The Open University is covered by the OU Computing Code of Conduct, further information about which is provided in the Computing Guide. You will usually

find a forum's terms of use linked from its home page, or listed in the code of conduct that you are asked to agree to when you first register for an account.

- Considerations of copyright and **plagiarism** (cheating by using another person's work as if it were your own) apply to online discussions. If you are quoting something written by someone else, put it in quotation marks and acknowledge the source.
- Some forums are not wholly public – in which case, messages should not be copied outside the forum. The forum's terms of use may specify this.

1.3.4 Copyright

One of the reasons the web has grown so quickly, and one of its most fascinating aspects, is that almost anyone can publish almost anything on it. It is very easy to find information, images, audio and video files on the web, which you can then save and incorporate into your own material.

Copying is so easy that people often make the mistake of assuming that everything on the web is freely available. This is not the case: most material you will come across is likely to be covered by copyright law. This applies not only to online television programmes, music, photographs, books, and so on, but also to information – for example, in the form of online academic papers or simply in someone's blog.

Material not subject to copyright is said to belong in the **public domain** and can be used by anyone. Older works of art and literature, such as the works of Shakespeare and Beethoven, are in the public domain. However, individual printings, adaptations or recordings of those works are copyrighted to the publisher or performer. The situation can become very complicated because, for example, material may be in the public domain in the USA but still under copyright in the UK. As a result, it is always wise to assume that any third-party material (that is, material originating from someone else) is still protected by copyright unless you're sure it's in the public domain.

Copyright holders can prosecute individuals and organisations for infringing their rights; in recent years, music and film companies have sued individuals for very large sums of money. Below are some general points you should bear in mind.

- You should seek the author's permission if you wish to use any copyrighted material. Just because something is on the web does not mean it is freely available for you to use.
- Many websites have usage policies explaining how their material can be used. Some are more restrictive than others, so make sure you find and follow the relevant policies.
- Information published online may have been put there by someone who is not the copyright holder.
- You can make use of copyright print material for your own study purposes: the generally accepted guideline from copyright legislation is that you can download and print or photocopy limited extracts of any one book without seeking permission, but you must give a full reference to show where it has come from.

This may all seem rather intimidating, but it's not quite as bad as you might fear – fortunately, copyright law makes some concessions to students. As a result, you don't have to ask permission to use copyrighted material in answering an assignment question, although you must still include references. However, if you want to reuse the same

material for any other purpose at a later date, normal copyright law applies and you must seek permission.

The Library website includes further information on copyright.

1.3.5 Good academic practice

One of the things TM111 encourages you to do is use the web as a resource in your study and your life generally. You'll use it in your assignments, and you should find it a great help in understanding and practising the things you learn.

However, using information found on the web in this way can cause problems unless you take a little care. When using material written by other people, you can quote their words (as you saw above), but good academic practice is that such quotations should always be *limited* and *acknowledged*. This applies whether you're quoting from the TM111 materials or from other sources such as websites, journals or newspapers.

It can be very tempting to copy and paste large chunks of text into your notes – and possibly then into your assignment answers – without giving a reference. However, that is very bad academic practice. It's far better to use quotations sparingly and to rewrite most of the material in your own words. This allows you to show that you've understood the material and it also helps you to remember it.

In addition, it's good academic practice to give a reference to the source of any third-party material you include in your own work. Not doing so is not only impolite, as you're failing to acknowledge the help that someone else's work has given you; it's regarded as plagiarism and is never acceptable.

TM111 will teach you the correct way to use the work of others and help you to establish good academic habits. As well as using information found on the web, you will be asked to collaborate with other students to create and share information. You'll also be encouraged to discuss aspects of the module in your tutor group forum. Both of these activities will help you to develop academic practices that will stand you in good stead in future studies, as well as being valuable skills more generally. You can probably guess that, just as with other third-party materials you make use of, it's important to give references to the contributions of other students when you include them in your own work; otherwise you could fall into the trap of plagiarising their work, which is definitely something to be avoided.

Unless you are specifically asked to do so in the TM111 materials, you should not pass your work on to other students, especially if it is part of an assignment. One good reason for this is that The Open University uses detection software that is very good at spotting plagiarism in assignments! If you're in any doubt about what is acceptable and what is not, then do ask your tutor. The boundary between collaboration and plagiarism is sometimes not clear, and your tutor will help you understand whether you are in danger of crossing it.

To help you with this, the OU Library's website provides a guide on how to reference sources of information correctly, including those you might find online. Links to that and to other useful sites on how to follow good academic practice and avoid plagiarism are on the module website.

1.3.6 Conclusion

In this section, I've discussed some of the ways in which you can make good use of the web, both for interacting with other people and for finding information. When working online, it is also important to consider how to protect yourself and your computer, and that's what I'll turn to next.

1.4 Online safety

The internet provides many ways for people to get in touch with each other, but this ease of contact can have downsides for the unwary. It can expose internet users to the dangers of malicious software, to unsolicited and nuisance emails, and to a variety of hoaxes. In this section, I'll describe some of these problems and suggest how you can protect yourself from them in order to keep your personal data safe.

1.4.1 Malware

Activity 1.14 (exploratory)

What do you understand by the term 'malware'? Write down a sentence to explain this term.

Comment

Software designed to cause damage is known as **malware**. There are several types of malware, four of which are described below. However, be aware that as malware evolves to avoid detection, the boundaries between the different categories are tending to blur.

Types of malware

The best-known type of malware is probably the **virus**. This is a piece of software that has been written to attack software on your computer, often with the specific intention of causing harm – deleting files, for example. A virus attaches itself to other software on your computer and activates when that software is run. Viruses are so called because they are designed to spread quickly and easily from one computer to another via internet connections or external storage devices such as memory sticks.

Another type of malware is the **worm**. This is a piece of malicious software that runs 'in the background', doing some damage to your computer even though you may not realise it is running. Worms can make copies of themselves, and those copies can spread via an internet connection. A worm typically consumes resources by running on a computer; in a major attack, all of a computer's processing resources could be used in running the worm and its copies.

The **trojan** is a digital equivalent of the legendary wooden horse that smuggled Greek soldiers into Troy. It appears to be legitimate software, such as a screensaver, but behind the scenes it is causing damage – perhaps allowing someone else to gain control of the computer, copying personal information, deleting information, or using email software to pass itself on to other computers.

Finally, **ransomware** is a type of malware that prevents a user from accessing their computer either by locking the computer screen or by blocking access to computer files until a 'ransom' is paid. Typically, this form of malware is used to extort money from the user to 'ransom' the computer, but it could also be something relatively minor, such as being obliged to complete a survey.

Protecting your computer

There are three main ways to protect your computer against malware.

1. Ensure that your computer has the latest **patch** from the producer of your **operating system (OS)**. Microsoft, Apple and other producers frequently issue patches for their products.
2. Make sure other software is kept up to date – Adobe Reader, Flash, Java and web browsers (such as Mozilla Firefox, Google Chrome, Opera, Safari, etc.), to name just a few. As new malware is discovered, so new versions of software are released that guard against it.
3. Install **anti-virus software** and keep it up to date. Anti-virus software catches a very high percentage of malware, but only if the version on your computer is regularly updated. Remember that if you don't use Windows, it is still possible to pass on files infected with malware to Windows users. That's why the main job of anti-virus software for Apple's Macintosh operating system, macOS, is to check files for things that could infect Windows machines.

In addition, you can use a piece of software called a **firewall**. This tries to stop unauthorised access to your computer without impeding your own authorised online access. There may be a firewall built into your computer's operating system; others may be present in the hardware that connects your computer to the internet.

As well as the technical protections described above, you should protect yourself by using anti-virus software to scan any files you receive before you open them. This should include:

- files you download from the web
- files given to you on removable media such as a CD or memory stick
- files attached to emails.

Bear in mind that no reputable software company sends unsolicited email messages with attachments, claiming to be giving you an update.

1.4.2 Spam

Spam is the general term for unsolicited emails or text messages sent to large numbers of people. They could be hoax messages designed to mislead, or they could be used to advertise a product.

In terms of advertising, spam is similar to the marketing leaflets and letters that drop through your letterbox at home. However, this paper mail is subject to legislation that tightly controls the range of products and services being offered. The equivalent legislation does not yet exist in the electronic world, although new laws are being introduced. For example, in Europe, the EU 'Directive on Privacy and Electronic Communications' came into force in the latter part of 2003 and covers both email and SMS spam. In the USA, the federal law 'Controlling the Assault of Non-Solicited Pornography and Marketing' (CAN-SPAM) took effect in January 2004. Though such national legislation is intended to limit the volume of spam email, in practice this is a very difficult task because the internet crosses national borders. Spam can be sent from one country to another, and countries that have legislation find it hard to enforce their rules in countries that do not.

Spam email can be sent only if the *spammer* (the person initiating the spam) has a collection of email addresses to send to. A 'random email generator' is a computer **program** that creates addresses by combining common surnames and online email account names, e.g. gmail and yahoo. Other ways to 'harvest' email addresses include:

- accessing company databases
- searching websites
- searching online discussion groups
- including links in images within emails, which when clicked by the recipient inform the spammer that the message has been opened
- infecting unprotected computers with malicious software to look for addresses.

Spammers may harvest vast numbers of email addresses, but not immediately know whether a particular email address is 'live' (actually in use) – it could be that the original owner of the address no longer uses it. So beware of spam emails that appear to give you the option to unsubscribe from a mailing list (very often by offering a web link to click on). If you select this option, this will verify to the spammers that your email address is live; they can then continue to send you spam, or even sell your email address to other spammers.

Below are some guidelines for minimising the spam you receive.

- Don't reply to spam emails.
- Don't use the unsubscribe option in response to unrequested emails.
- Don't reveal your email address unless you want to receive mail from a particular source.
- Don't post your email address on a website.
- Create a new email address when registering on websites or joining discussion groups. You could also use a spare one that you're happy to abandon if necessary (e.g. a web-based email account such as those offered by Yahoo, Microsoft, Google).
- Set your email software to filter out unwanted messages. Most are equipped with 'junk mail' filters that can be set to identify and remove spam messages as they arrive in your inbox. Additionally, your **internet service provider (ISP)** may filter incoming mail for spam before it even reaches your inbox.
- Ensure that all other users of your computer follow the above guidance.

1.4.3 Hoaxes

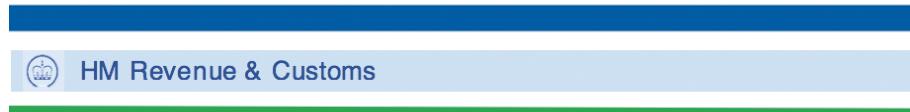
A hoax message aims to mislead, often relying on the naivety of its recipients. Sometimes these are fairly benign; they may spread ‘urban myths’ or untrue news stories. A recent (2015) hoax message claims that Mark Zuckerberg, founder of Facebook, will give \$45 million to a thousand Facebook users. To be selected for the chance of winning, the recipient just has to copy and paste the message into Facebook and tag five to ten of their friends.

Other hoaxes are more malicious; for example, emails that appear to come from a legitimate source advising people to delete particular files on their computers, which causes their computer to malfunction. Hoax messages can spread rapidly via email and forums, often passed on unwittingly by work colleagues, family, friends and even reputable online retailers. Unfortunately, users who fall for hoaxes can cause problems both for themselves and for others. A hoax can generate spam when it directs the recipient to pass on the message, cause files to be deleted unnecessarily and potentially harmfully (by directing the user to delete them), and generally cause panic.

Your best defence is to be sceptical! Most anti-virus software vendors maintain information on hoaxes on their websites, so you can check such sites if you suspect a hoax. Alternatively, you can use a search engine: by searching for significant terms contained within the hoax message, you may find reports on reputable websites such as that of the software security company, Sophos, or the Hoax-Slayer site.

1.4.4 Phishing

A particular kind of hoax message aims to persuade users to disclose private information such as their credit card details and PIN. This is called **phishing**. The recipient of the message may be directed to a hoax website where they are requested to part with their details. Figure 1.10 shows an example of an email that I received which supposedly came from HM Revenue & Customs (HMRC).



Tax Refund Calculations

Dear Sir/Madam

Unique Reference No: 557949602

After a review of your previous tax year payments, we are determined that you are eligible to receive a tax refund of £229.72 due to over payments in tax. In order to claim your tax refund, please complete our tax refund form online by clicking below.

[Get Started Now ➞](#)

Please note:

HM Revenue and Customs (HMRC) will usually send repayments within 2 weeks, but this may vary in some cases. You should wait 4 weeks before contacting us about the payment.

HM Revenue and Customs

Figure 1.10 An attempt at phishing

Activity 1.15 (exploratory)

- Looking at the email in Figure 1.10, what warning signs are there that might alert you to the fact that this is an attempt at phishing?
- What simple checks could you carry out to determine whether the email was malware?

Comment

- At first glance the email seemed in order, but there were a few warning signs.
 - The message is not addressed to the recipient (me) by name, although it mentions a supposedly unique reference number and a specific sum of money. This can indicate a message sent randomly to large numbers of email addresses.
 - The wording of the message is a little strange, e.g. 'we are determined that you are eligible'. I think it unlikely that such errors would be present in genuine messages from HMRC.
- In the actual email, you can position your mouse pointer over the link ('Get Started Now' in the example in Figure 1.10) or long-press on touch screen devices, such as smartphones. Look at the web address that appears either as pop-up text or at the bottom of the message window. If it seems to be unrelated to the sender of the message, then you should be even more suspicious. You can also position the mouse pointer over the sender's email address to check who it is actually from. After checking HMRC's website, I discovered that they never send information about tax rebates or refunds by email, and the website shows examples of phishing attempts.

The above points convinced me not to follow the instructions in the message. Yet despite all these warning signs, some people do hand over their details in this way.

It's very important *not to click* on any links in these sorts of messages. Even if you don't enter your account details, making any response at all may confirm to the phisher that your email address is valid, leaving you open to further hoaxes and spam. Simply clicking on a link also risks your computer being infected with malware that could distribute the same message to all the email addresses – including those of your work colleagues, family and friends – stored on your computer.

After receiving the email shown in Figure 1.10, I searched online and found a reputable site (millersmiles.co.uk, but there are others) that contained the information shown in Figure 1.11.

The screenshot shows a detailed report of a scam. At the top, it says 'scam report'. Below that, 'Date Reported: 13th October 2016' and 'Risk Level: MEDIUM-HIGH'. The 'details' section includes: 'Email Subject: Tax Refund Review', 'Apparent Sender: HM Revenue and Customs', 'Return Address: marketing@eximius.com', 'Email Format: HTML', 'URL of Web: http://hmrctaxrefundonlineformservicesdirect.flyin', 'Content: gleafseason.top', 'Anchor text of 1) Get Started Now', 'URLs: Location: PISCATAWAY, NEW JERSEY, UNITED STATES', and 'Scam number: 25095-210582-488562'. The 'Comments:' section lists two bullet points: 'Email asks you to confirm/update/verify your account data at HM Revenue and Customs by visiting the given link. You will be taken to a spoof website where your details will be captured for the phishers.' and 'HM Revenue and Customs never send their users emails requesting personal details in this way.'

Figure 1.11 Information about a similar phishing attempt

Most phishing messages try to get you to provide some personal information (see Figure 1.12). Clearly those trying to get your online banking details are aiming to get access to your money. However, others could be trying to access your email, blog, instant messaging or online auction accounts (if you have any), then use these accounts to distribute more phishing emails.

A more focused type of phishing, spear-phishing, uses clever tactics to target a specific individual or an organisation seeking access to sensitive information. Spear-phishing attempts are usually conducted for financial gain or to carry out espionage.

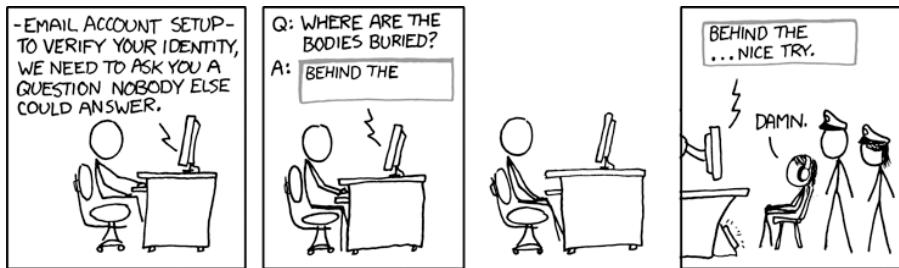


Figure 1.12 Phishing: fooling someone into giving away secret information

If you have a job that provides you with an email account, then you have probably also seen messages claiming to be from your company's IT department, asking you to enter your username and password into a website to reset your email account. I've certainly had them sent to my Open University email account. As with requests for you to disclose your financial details, you should be careful when disclosing your username and password. A phone call to the relevant people in the company should be sufficient to find out whether or not the request is genuine.

1.4.5 Conclusion

In this section, I've discussed ways in which you can protect your computer and yourself online, ranging from taking sensible precautions against malware to guarding against presenting information about yourself to the world that you might later regret.

Summary

In this part, I've introduced several aspects of our increasingly digital lives that you will be learning more about, and indeed experiencing yourself, during your study of TM111. You've heard about the ever more significant role that digital technologies are playing in our digital, networked society, in areas ranging from entertainment to public services. Along with the opportunities available in the online world, you've also been introduced to some of the potential problems and how to avoid them.

In Part 2 of this block, you'll learn more about the development of the computer. Before you move on to that, however, it is important that you take stock of what you've learned so far. Considering the main study points at the end of each part is a good way to check your progress.

After studying Block 1 Part 1 you should be aware of, and understand:

- the concept of a 'digital' world
- the role of information and communication technologies in a digital world
- the importance of managing your online identity for personal and work reasons
- the legal, ethical and safety issues involved in the digital world
- the importance of making and keeping notes as you study
- how to work collaboratively online applying netiquette principles.

And finally...

If you didn't get a chance to do the 'How digital is your life?' quiz earlier, then please do it as soon as you can. You should also check the study planner on the module website and ensure that you have investigated the links related to Block 1 Part 1 there. Otherwise, you're ready to start Part 2, which directly follows this part in the book.

Answers to self-assessment activities

Activity 1.4

- a. The 65+ age group shows the smallest increase in use of instant messaging, that is 9 percentage points.
- b. The 25–34 age group shows the largest increase in use of instant messaging, that is 42 percentage points.
- c. One reason for the increase in use is that smartphones have become much more ubiquitous. While they are still expensive, the handsets are cheaper and more intuitive to use and the ‘bundles’ of telephone and internet access have become more affordable.

References

Associated Press (2012) 'Mobile carriers face a future without text messaging as data apps take over', *The Guardian*, 1 March [Online]. Available at <https://www.theguardian.com/technology/2012/mar/01/sms-pinger-whatsapp-messaging-mwc> (Accessed 6 February 2017).

Evans, B. (2015) 'WhatsApp sails past SMS, but where does messaging go next?', *Benedict Evans*, 11 January [Blog]. Available at <http://ben-evans.com/benedictevans/2015/1/11/whatsapp-sails-past-sms-but-where-does-messaging-go-next> (Accessed 6 February 2017).

International Telecommunication Union (2006) *ITU Internet Report 2006: digital.life* [Online]. Available at www.itu.int/osg/spu/publications/digitalife (Accessed 6 February 2017).

Ofcom (2015) *Adults' Media Use and Attitudes: Report 2015* [Online]. Available at https://www.ofcom.org.uk/__data/assets/pdf_file/0014/82112/2015_adults_media_use_and_attitudes_report.pdf (Accessed 20 October 2016).

Ofcom (2016) *Telecommunications Market Data Update Q1 2016* [Online]. Available at <https://www.ofcom.org.uk/research-and-data/telecoms-research/data-updates/q1-2016> (Accessed 13 March 2017).

Office for National Statistics (2016) *Internet Access – Households and Individuals: 2016: What the Internet is Used For and Types of Purchases Made, by Adults (Aged 16 or Over)*. Available at <https://www.ons.gov.uk/peoplepopulationandcommunity/household-characteristics/homeinternetandsocialmediausage/bulletins/internetaccesshouseholdsandindividuals/2016> (Accessed 6 February 2017).

Acknowledgements

The TM111 module team acknowledges the contribution of John Woodthorpe to the production of these materials.

Grateful acknowledgement is made to the following sources.

Figure 1.1. Hampshire County Council, Provided by Hampshire Cultural Trust

Figure 1.2. Taken from: <http://media-cache-ec0.pinimg.com/736x/3f/6c/35/3f6c35695014f2741197107b7e536fa2.jpg>

Figure 1.3. Jim Zuckerman/Alamy

Figure 1.4. Taken from: https://www.ofcom.org.uk/__data/assets/pdf_file/0024/83166/adults_media_use_and_attitudes_charts_-_section_3.pdf

Figure 1.5. xkcd.com This file is licensed under the Creative Commons Attribution-Noncommercial-ShareAlike Licence <http://creativecommons.org/licenses/by-nc-sa/2.5/>

Figure 1.6. xkcd.com This file is licensed under the Creative Commons Attribution-Noncommercial-ShareAlike Licence <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Figure 1.9. xkcd.com This file is licensed under the Creative Commons Attribution-Noncommercial-ShareAlike Licence <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Figure 1.11. Taken from: <http://www.millersmiles.co.uk/email/tax-refund-review-hm-revenue-and-customs>

Figure 1.12. xkcd.com This file is licensed under the Creative Commons Attribution-Noncommercial-ShareAlike Licence <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Every effort has been made to contact copyright holders. If any have been inadvertently overlooked, the publishers will be pleased to make the necessary arrangements at the first opportunity.

All rights including copyright in these materials are owned or controlled by The Open University and are protected by copyright in the United Kingdom and by international treaties worldwide.

In accessing these materials, you agree that you may only use the materials for your own personal non-commercial use.

You are not permitted to copy, broadcast, download, store (in any medium), transmit, show or play in public, adapt or change in any way these materials, in whole or in part, for any purpose whatsoever without the prior written permission of The Open University.

ISBN 978 1 4730 3186 9

3.1