

7

CORE Issues

Syllabus outcomes: 5.3.1, 5.3.2

Chapter outcomes

You will learn about:

- legal issues, such as copyright and piracy
- ethical issues, such as privacy and hacking
- social issues, such as the changing nature of work and enterprise
- industrial issues, such as ergonomic principles and industry standards.

You will learn to:

- examine legal issues as they apply to the development of information and software technology solutions
- identify the ethical responsibilities of software users and discuss issues of equity and inclusiveness
- identify rights and responsibilities of users of information and software technologies.

Key terms

Cloud computing

technology offering a range of applications via the Internet to perform tasks traditionally executed with software installed on an individual computer

Code of conduct

rules that set out standards of behaviour

Control

power to make decisions about who does and does not gain access to information and software technology

Copyright

ownership of intellectual property by its creator

Data accuracy

extent to which data is free of errors

Data bias

manipulation of data in order to present a one-sided view

Data security

protection of data from loss, wrongful access or modification

Equity and access

principle that all people should have equal access to the benefits that information and software technologies offer

Ergonomics

study of the relationship between machines and the people who use them

Hackers

people who deliberately intrude into computer systems without permission

Intellectual property

use of the mind to develop something new or original

Phishing

transmission of a seemingly legitimate email in an attempt to gather personal and financial information

Piracy

unauthorised copying of software

Privacy

right of an individual or group to keep their lives and personal affairs out of public view, or to exercise control over personal information

Telecommuting

working from home using modern technology to keep in touch with a place of employment

Webconferencing or videoconferencing

using Internet technologies to enable people in different locations to communicate via audio, video and text messages

Work health and safety (WHS) legislation

enacted workplace law that aims to protect the health, safety and welfare of people at work; previously known as occupational health and safety (OHS) legislation

IN ACTION

Social networking

Social networking has redefined the way we communicate with each other. Websites such as Facebook, Instagram, Snapchat and Twitter have changed society, simply because so many of us are living our lives online. Social networking services allow us to connect with others and share information such as photographs, videos and personal messages. Many sites allow users to create pages for a range of shared interests and, on the whole, social networking is regarded as a creative and enjoyable experience.

The increasing popularity of social media, however, has resulted in a more relaxed attitude towards privacy and many people seem willing to reveal intimate information online. Studies suggest that the majority of high school students say or do things online they would not want their parents or other adults to see. Provocative photographs, for example, as well as pictures showing drug and alcohol use, are casually published for the world to view. Although it may be fun to post a picture from a music festival or party, the consequences of such an everyday and seemingly harmless activity may be far-reaching. Some users have had job offers withdrawn after a potential employer viewed their Facebook page. Once something is uploaded, the task of removing it is more problematic than many people realise. Although the original post may be deleted, a copy of the image, video, audio or text may be stored on another computer or server. It may also have been printed or forwarded to others.

Given the prevalence of social networks, it is not surprising that there have been several high-profile breaches of

security on sites such as Facebook. This has resulted in growing unease about a range of issues, including identity theft, cyber bullying, trolling and online stalking. These concerns may intensify with the increasing popularity of location-based services that allow users to broadcast their current geographical position.

QUESTIONS

- 1 Name the types of information social networks allow us to share.
- 2 Identify the advantages and disadvantages of social networking.
- 3 Why is the task of removing an online post more problematic than many people realise?
- 4 Investigate why so many smartphone apps request access to your location – even those that have nothing to do with maps or navigation.
- 5 Businesses and advertisers can already access enormous amounts of personal data on social media websites – from where you live to your interests and shopping habits. Sentiment analysis is now being used to mine online conversations for words and thoughts to be sold to advertisers. Discuss whether or not you consider this to be an ethical practice.



◆ **Figure 7.1** Generational change and the power of social media have dramatically altered notions of privacy. As personal data files expand, our lives are increasingly becoming public.

7.1 Legal issues

Those who develop software, like those who write poetry, compose music or paint pictures, have a right to control the production and reproduction of their work and to receive the benefits from their work. This right is called **copyright**.

Computer application copyright

All computer applications have copyright protection, but some software developers allow others to use their programs freely or within certain limitations. However, for commercial software programs, it might surprise you to learn that when you pay for the software you do not actually own it. What you have purchased is a licence to install it and use it on one or more devices.

In the field of information technology, copyright laws are used to legally license a range of software programs and, in doing so, protect the **intellectual property** of the people who have created them. Under Australian law, copyright generally lasts for 70 years after the death of the creator.

Piracy

The unauthorised copying of software is referred to as **piracy**. Most retail programs are licensed for one device or for one user at any time. Purchasing the software entitles the buyer to become a licensed user.

A licensed user is allowed to make copies of the program for backup purposes, but it is against the law to give copies to friends and colleagues. People who sell software that they have copied without authorisation are considered to be selling stolen goods.

Intellectual property

Most people agree that it is wrong to steal, and most agree that laws in our society that discourage theft of property are important. Yet many of the same people have difficulty applying those same principles to intellectual property – to the creative and innovative ideas that a person has worked on, perhaps for years of their life, and on which their income may depend. Intellectual property is a product of the mind that has commercial value.

Data security

Data security refers to the protection of data from loss or modification. The loss of data can occur accidentally; for example, if a hard drive malfunctions, a file is mistakenly deleted or a laptop computer is misplaced. Other breaches of security may occur if you reveal a password to someone or leave a computer unattended while you are logged in to a password-protected account. People who deliberately intrude into computer systems without permission are referred to as **hackers**. Hackers are continually developing new attack tools and strategies to gain unauthorised access to systems, making it difficult for organisations to develop and implement effective data security procedures.

Security and protection

There are also laws designed to protect information systems and to prosecute people who commit computer crime. Examples of computer crime include identity theft, virus attacks, credit card fraud, phishing, spamming, denial-of-service attacks, and shopping and auction site fraud.

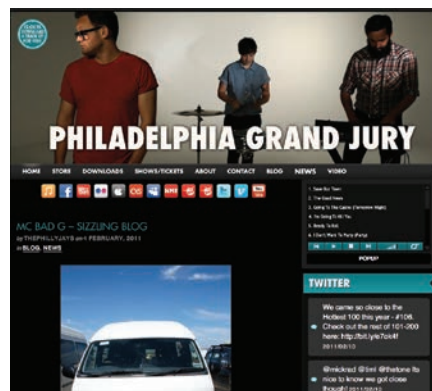


Figure 7.2 Sharing music over the Internet violates the laws of many countries and, in some cases, persistent downloaders are prosecuted or have their Internet connections suspended. Many artists, including Australian band Philadelphia Grand Jury (pictured here), allow fans to legitimately download a selection of their music from the Internet.

Phishing is a major security issue involving the transmission of seemingly legitimate email in an attempt to gather personal and financial information from recipients. Typically, phishing involves sending emails asking Internet banking customers to follow a link to a fake website and enter their personal banking details. The number of reported cases of credit card and auction site fraud has increased dramatically in recent times, largely due to criminals embracing the Internet and transforming it into another area of criminality.

Legislation

We live in an environment that increasingly requires us to rely on computers. However, there are still many people who, due to lack of opportunity or sometimes as a result of unlawful discrimination or harassment, have limited opportunities for education and training in the field of information and software technology. The introduction of equal employment opportunity (EEO) legislation has gone some way to ensuring, for example, that women, Indigenous Australians and people with a disability are given the chance to gain employment and advance their careers. This means having workplace rules, policies, practices and behaviours that are fair and do not disadvantage people because they belong to particular groups.

Work health and safety (WHS) legislation is another legal safeguard for workers. WHS legislation aims to protect the health, safety and welfare of people at work by laying down general requirements that must be met at every workplace. In terms of information and software technology, this can include basic considerations such as

ensuring employees are provided with the necessary training, instructions and supervision needed to work safely with computer equipment.

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Spear phishing targets specific individuals or small groups of employees in order to steal intellectual property or other sensitive data. The apparent source of the email is likely to be a trusted source, such as a company manager or a colleague.

ACTIVITIES

- 1 List four legal issues associated with developments in information and software technology.
- 2 Outline the licensing arrangements that apply to most software programs.
- 3 Identify five computer crimes related to security and protection of data.
- 4 Discuss the importance of equal employment opportunity legislation.
- 5 Investigate the landmark 2015 piracy case involving several Australian Internet service providers, including iiNet, and Dallas Buyers Club LLC. What was the outcome of this case and why was it so significant in terms of illegally downloaded videos?



Figure 7.3 As a rule of thumb, if you receive an email message or phone call from any organisation asking for personal information, such as your bank account number and password, you should view it as a potential fraud attempt.



Figure 7.4 Anti-discrimination legislation is applicable in the workplace and aims to create an environment in which people are judged according to their abilities and not treated unfairly because of factors such as their age, marital status, race or disability.

7.2 Ethical issues

Ethics are the set of standards or moral principles that determine the behaviour of a person or a group of people. In the following section, some of the ethical issues associated with information and software technology are examined.

Codes of practice and conduct

Codes of practice and conduct are developed by business and industry groups in order to promote honesty and fairness in their dealings with the public and clients. A **code of conduct** is basically a set of rules that sets out standards of service to be provided and what can be done if these standards are not met. Such codes are not necessarily legally enforceable, but they are often used by an industry as a means of self-regulation. Codes of conduct apply to many areas, including banking, animal welfare, advertising and journalism. Most information and software technology industries have adopted codes of

practice and conduct. The Internet Industry Association, for example, has a code that requires Internet service providers to take reasonable steps to ensure Internet access accounts are not provided to persons under the age of 18 years without the consent of a parent, teacher or other responsible adult.

Privacy and security

The terms **privacy** and 'security' are sometimes used to describe the same problem, but they are separate issues. Privacy may be described as the right of an individual or group to keep their lives and personal affairs out of public view, or to exercise control over personal information. In the past, discussions about privacy tended to focus on the protection of home and family life, but attitudes have changed with the ongoing development of information and software technology. Many people are now concerned about the ways in which governments or organisations use personal details such as their age, address, phone numbers and spending habits.

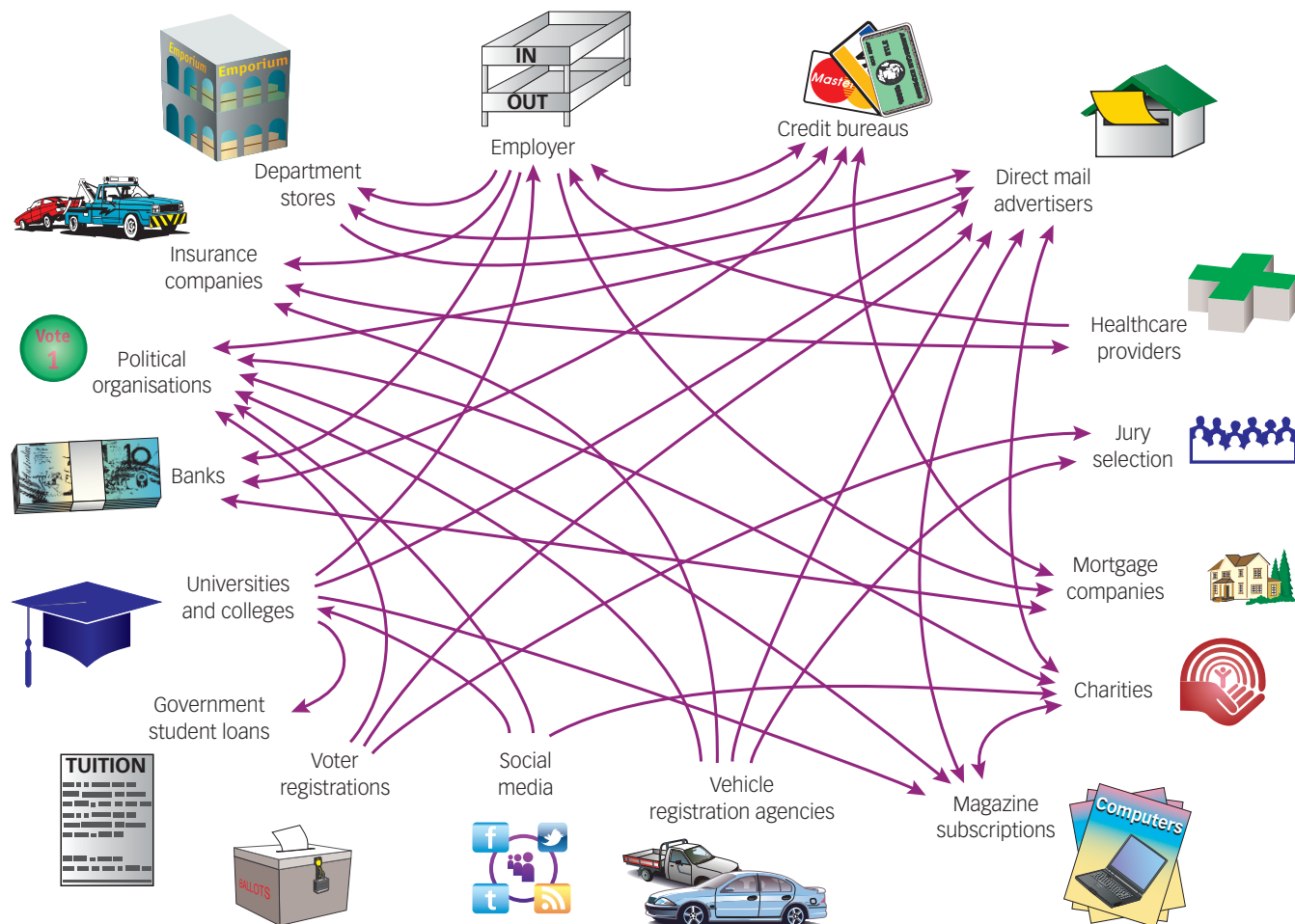


Figure 7.5 When an organisation acquires data about you, it is sometimes shared with, or sold to, other organisations.

Inappropriate usage

It is impossible to ensure that all users of information and software technology act responsibly. Personal integrity is an important part of your life as a student, and it will continue to play a major role in many of the personal and professional decisions you make outside school. Largely as a result of the Internet, there continues to be widespread concern about the inappropriate use of information and software technology. Examples of inappropriate software use include using email or a social networking site to bully a classmate or circulate offensive material.



Figure 7.6 According to recent research, more than half of Australian workers spend approximately 30 minutes per day using information technology in a manner that could be considered inappropriate.

Accuracy, validity and bias of data

Other ethical issues that need to be considered in relation to information and software technology include the accuracy, validity and bias of data. **Data accuracy** simply refers to the extent to which data is free of errors. Inaccurate data is usually a mistake, but sometimes the mistake is deliberately made. It is not always possible to know whether or not data is accurate. Digital photographs, for example, can easily be altered, leaving little or no evidence of their unreliability.

Most problems with accuracy arise from incorrect data entry using a keyboard. There are many ways to improve

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Statistical data is most valid when it is collected from a large, representative population. The larger the sample size, the better. Bias in polling can happen when survey respondents do not represent the entire population. Researchers may reach a conclusion in advance and then create the sample audience that provides the preferred results.

the accuracy of data entry. Software programs can check for spelling mistakes or reject an entry that has the wrong number of characters. See chapter 10: Database design for more information on data accuracy.

Data can also be manipulated in order to present a one-sided view of a particular situation. Sometimes poor collection techniques can result in skewed results. This is known as **data bias**. The chart and graph facilities of spreadsheet programs, for example, can easily present trends and relationships that, on closer examination, favour one point of view at the expense of another. Consider a situation where a company displays a graph showing increased revenue, but deliberately avoids showing a graph of increased expenses.

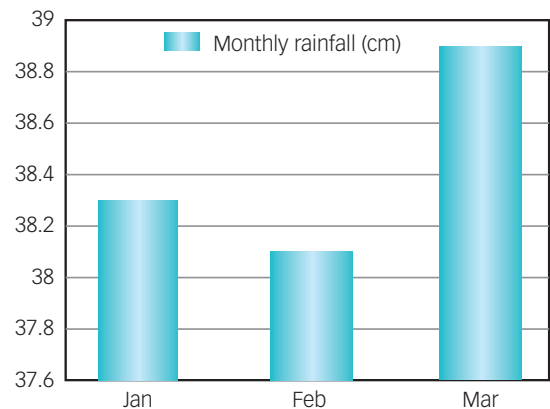


Figure 7.7 The graph above could be considered biased as it exaggerates the difference between March and the other two months. It appears as though March had drastically more rainfall compared with January and February. However, March's rainfall is less than one centimetre more than the other two months. The vertical axis does not begin at zero.

ACTIVITIES

- 1 Discuss the importance of industry codes of conduct.
- 2 Explain the difference between data security and privacy.
- 3 Describe three ways in which data may be lost.
- 4 Identify two examples of inappropriate use of software.
- 5 Define cyber bullying and suggest a strategy that could make it less of a common or harmful occurrence among teenagers.
- 6 Create a digital presentation that addresses a legal or ethical issue related to information and software technology. (You do not have to limit yourself to those mentioned above.) Keep in mind the following considerations when creating your presentation:
 - Who is your target audience?
 - Why is this issue worth researching?
 - Are there any recent news items that you can refer to in the presentation?
 - Have you or anyone you know been directly impacted by the issue?
- 7 Using an online quiz tool such as Kahoots.it, create an issues quiz for your classmates.

7.3 Social issues

Information and software technology has altered the nature of work and enterprise to the extent that most jobs in the developed world now involve computers. What will society be like as we rely more and more on computers and automated systems rather than interacting with people?

Many new jobs have been created because of the development of information and software technology; for example, database administrators, social media managers and web designers. However, some jobs have been made redundant as a result of new technology. Travel agents, for example, have been significantly affected by technology. Many people now prefer to research and book their own travel plans online without the assistance of a travel agent.

Employment trends

Employment trends, such as **telecommuting**, **webconferencing** or **videoconferencing** and the introduction of the virtual office have changed the nature of work and enterprise. Telecommuting involves working from home, using modern technology to keep in touch with your place of employment. Jobs can be relocated to places where it is more comfortable, more convenient or less expensive to live. Many people are able to work, learn and study whenever and wherever they want, and the emergence of a range of new tools – particularly cloud-based services – has eased many of the logistical challenges posed by telecommuting and online collaboration.

Cloud computing

Cloud computing allows users to access a range of applications via the Internet to perform tasks traditionally carried out with software installed on an individual computer. See figure 7.8.

Telecommuting

Some of the benefits of telecommuting for employers include the reduction of office running costs and the removal of travel-related problems that may lead to the late arrival of employees. Employee benefits include the flexibility to work around family and personal needs, as well as the elimination of the time, costs and stress associated with travelling to and from work.

It is important to consider the potential negative impacts of telecommuting. There is less opportunity, for example, to meet people and share ideas. Webconferencing also raises the issue of loss of personal contact.

Webconferencing uses Internet technologies to enable people in different locations to communicate via audio, video and text messages. It is considered relatively



◆ **Figure 7.8** Rather than using local servers or personal devices to handle applications such as word processors and spreadsheets, cloud computing delivers applications through a browser that can be accessed anywhere in the world.

inexpensive to set up – particularly when compared to the travel expenses associated with face-to-face meetings.

Virtual offices

Another development in the workplace with cost-saving potential is the virtual office. Technology allows workers in many



◆ **Figure 7.9** There is a range of software applications that allow virtual office workers to communicate with each other and organise their working day.

industries to perform their duties from almost anywhere. The available choices for communicating while on the go include smartphones, tablets, laptops and a range of other devices and services allowing remote access. Wireless networks are also increasingly available wherever people congregate.

Rights of access

Equity and access refers to the principle that all people should have equal rights and access to the benefits that information and software technologies offer. **Control** refers to the power to make decisions about who does and does not gain access to information and software technology. Unfortunately, not all people benefit from information and software technology. Quite often, those on lower incomes are unable to purchase technology or learn how to use it. Others have difficulty gaining access due to a disability or because they live in an isolated community. Access and participation can be difficult for some groups who, for one reason or another, are excluded from the information society, or perceive that they are left out. For example, the elderly are sometimes reluctant to become involved in information and software technology due to lack of confidence.

The nature of our society

Computers benefit society in many ways, including creating technology jobs, enhancing vehicle safety,

predicting climate change and improving medical research. We can now more easily connect with people thanks to online collaborative workspaces, social networking applications, mobile devices and Internet telephone services. However, it is feared the ease of electronic communication may lead to weaker social ties because people are less inclined to leave their homes and actually interact face to face with others. Constant computer use may cause us to place more emotional value on events taking place online as opposed to what is actually happening in our real lives. Some features of information and software technology, such as round-the-clock Internet access and the isolated nature of its use, may affect modern society in ways that may not be fully understood for quite some time.

Industrial issues

Industrial issues often focus on the importance of safe and healthy workplaces. Most organisations use information technology and they are required to provide safe computing facilities for staff, customers and others who interact with their equipment. Personnel using information technology also have a duty of care to ensure that they work in a manner that is not harmful to their own health and safety and the health and safety of others.

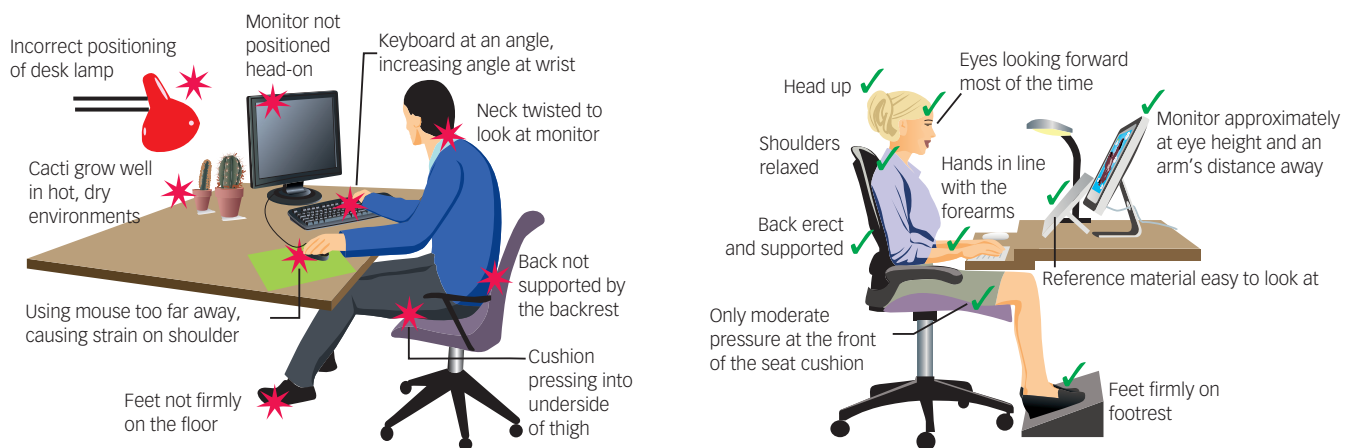


Figure 7.10 Ergonomics is the study of the relationship between machines and the people who use them. In the workplace, this includes the design of furniture and computer components such as the keyboard and mouse.

ACTIVITIES

- 1 Summarise the changes to the nature of work that have occurred due to advances in technology.
- 2 Information and software technology is more likely to have changed someone's work rather than eliminating it completely. List three occupations that have been affected by technology.
- 3 'Those who have regular access to information and software technology are more likely to advance, while those who do not may find themselves marginalised.' Do you agree with this statement?
- 4 'Constant computer use may cause us to place more emotional value on events taking place online as opposed to what is actually happening in our real lives.' Discuss whether or not you agree with this statement.
- 5 Present a report on the industrial issues related to the information and software technology sector. Pay particular attention to ergonomics and the rights and responsibilities of people who regularly use information technology.



Review questions