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Key Term

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Quick Check 7.4

1. For each of the following scenarios, state whether the person described is guilty of copyright infringement, plagiarism, both or neither.
 - a) Alice takes her friend's artwork and submits it for a contest as her own artwork without her friend's permission.
 - b) Bob installs a computer game on two different computers even though the licence he purchased allows for one installation only.
 - c) Cindy purchases an educational licence for a spreadsheet program and installs the program on her home laptop for school projects.
 - d) Dan downloads some public domain source code and submits it as his own for a homework assignment.

7.5 Impact of Technology on Everyday Life

So far in this chapter, we have learnt about the effects of data corruption and loss, the threats of unauthorised access and cyberattacks, as well as the legal and ethical issues surrounding intellectual property. These topics have risen to prominence in recent years due to the rapid rate at which technology has influenced our daily lives.

At this point, it is useful to look at the bigger picture and evaluate the overall impact of technology. Since the World Wide Web's invention in 1989 and the widespread availability of smart phones, technology has completely changed the way we work, live and play.

Table 7.4 provides a brief overview of the social and economic impact of technology on various areas of life, as well as related ethical issues.

▼ **Table 7.4** Impact of technology on various areas of life

Area	Impact/Issues
Communication	<p>Social impact</p> <ul style="list-style-type: none"> On the positive side, the Internet has enabled diverse cultures to interact and share ideas with each other. Social networking sites have also allowed users to remain connected with friends, family and colleagues even over long distances. On the negative side, some people use the Internet to reinforce their existing opinions or to spread rumours and misinformation. <p>Economic impact</p> <ul style="list-style-type: none"> The rise of smart phones has led to an increased focus on mobile devices and mobile applications in the computing industry. The rise of social media has led to the increased use of social media for marketing purposes and has helped businesses to better understand buying habits and consumer needs by analysing social media posts. Improvements in communications technology have also reduced business costs through the use of cheap and effective video conferencing calls in place of face-to-face meetings. <p>Ethical issues</p> <ul style="list-style-type: none"> Should some kinds of false information on the Internet be blocked or would this be taking censorship too far? Is it right to collect and analyse social media posts in ways that the original authors may not have intended?

▼ **Table 7.4** Impact of technology on various areas of life (continued)

Area	Impact/Issues
Education	<p>Social impact</p> <ul style="list-style-type: none"> • On the positive side, technology has provided better videos, simulations and collaboration tools for lessons to be more engaging and relevant to students, both inside and outside the classroom. The open sharing of information on the Internet has made education accessible to all, even learners from disadvantaged backgrounds. • On the negative side, technology has made it more challenging for educators as students' attention spans are getting shorter due to the technology and social media that they are used to today. <p>Economic impact</p> <ul style="list-style-type: none"> • The rise of open courseware has led to a large number of for-profit and non-profit organisations that offer customised lessons on a variety of topics for self-study online. • Many educational institutions have also invested heavily in the materials and infrastructure needed to conduct lessons over the Internet. • Some traditional educators find that they need to retrain and pick up new skills to better utilise these new technologies for education. <p>Ethical issues</p> <ul style="list-style-type: none"> • Should students be allowed to use mobile phones in school? • Can education technology ever be more effective than a good teacher?

▼ **Table 7.4** Impact of technology on various areas of life (continued)

Area	Impact/Issues
Finance	<p>Social impact</p> <ul style="list-style-type: none"> • On the positive side, the rise of financial technology has enabled consumers to spend, borrow, invest and save money through low-cost and easy-to-use mobile and web applications. There is no longer a need to perform such transactions in person. Individuals have also become better-educated on how to make smart financial decisions using information that is freely available on the Internet. • On the negative side, cyberattacks and the ease of obtaining false information on the Internet has made some people more vulnerable to financial scams and other get-rich-quick schemes. <p>Economic impact</p> <ul style="list-style-type: none"> • Financial technology is currently an area of growth in the financial industry. Numerous companies have been started to make financial services more efficient for both individuals and businesses. These companies typically use technology and software to reduce the time, cost and effort needed for payments, investments, fundraising, trading, and/or data analytics for both businesses and individuals. • With the evolution of technology, the time needed to perform a financial trade has decreased from seconds down to mere microseconds. This has led to the rise of algorithmic trading, which is the study and refinement of algorithms, to make trading decisions at speeds not possible by a normal human being. <p>Ethical issues</p> <ul style="list-style-type: none"> • Should financial technology be limited to protect more vulnerable users? • Is it safe or acceptable to have financial markets controlled by secret algorithms instead of humans?

▼ **Table 7.4** Impact of technology on various areas of life (continued)

Area	Impact/Issues
Healthcare	<p>Social impact</p> <ul style="list-style-type: none"> • On the positive side, technology has enabled telemedicine, which is the use of video conferencing and other technology, for doctors to provide medical consultations and diagnoses over the Internet. This gives patients who are located in remote places or have limited mobility better access to healthcare. • On the negative side, some patients find the use of robots and other technology in healthcare impersonal and mistrust the ability of machines to provide proper healthcare. Other patients may misuse information from the Internet and make potentially dangerous decisions based on incorrect diagnoses. <p>Economic impact</p> <ul style="list-style-type: none"> • Technology has created new areas of growth in the healthcare industry, such as the provision of telemedicine solutions to existing healthcare businesses. In particular, many of these solutions provide a way for patients to securely transfer potentially sensitive medical information over the Internet. • There is also an increased focus in automating healthcare processes through the use of robots to dispense medicine and other more menial tasks. This may in turn cause such jobs to disappear from the job market. • The rise of 3D-printing technology has also opened up new opportunities in the building and customisation of prosthetic limbs, hearing aids and dental fixtures. <p>Ethical issues</p> <ul style="list-style-type: none"> • Is it acceptable for robots to replace humans in providing certain kinds of healthcare? • Is it acceptable to transfer private medical information over the Internet?

▼ **Table 7.4** Impact of technology on various areas of life (continued)

Area	Impact/Issues
Transportation	<p>Social impact</p> <ul style="list-style-type: none"> On the positive side, transport has become less stressful and more predictable for travellers due to the availability of detailed maps as well as real-time information on bus frequencies, traffic congestion levels and street-level photographs of neighbourhoods around the world. All this information is also available at low cost through popular mobile devices. On the negative side, some people are uncomfortable with how pictures and information about themselves or their home may be used by mapping companies without their permission in order to build more accurate maps for travellers. <p>Economic impact</p> <ul style="list-style-type: none"> The rise of self-driving vehicles is likely to open new areas of growth in the travel industry. Singapore is one of the first countries where self-driving cars are being tested, and if successful, the technology will likely revolutionise the motor industry. There are also multiple new companies that offer on-demand rides via mobile applications. These developments have led to sweeping changes in the taxi service industry as well as employment opportunities for taxi drivers. Mapping technology is also another area of growth with an increased focus on making 3D maps and geospatial data more accessible and useful to travellers. <p>Ethical issues</p> <ul style="list-style-type: none"> Is it acceptable for mapping companies to drive through neighbourhoods and take pictures to put them online?