



**TECHNOLOGY AND SOCIETY
TAS152**

STUDYGUIDE

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Topic 1

Cyber society: Core values and virtues

1.1 INTRODUCTION

This topic relates to the following module outcome:

- Demonstrate an understanding of the nature of cyberspace and the related ethical challenges to society.

The term 'cyberspace' refers to the virtual world of linked computers, servers, routers and other Internet-enabled devices (Bussel, 2013). However, although cyberspace was initially conceived as a community-based forum for sharing knowledge and ideas, over time its infrastructure has become indispensable to governments and trade networks and its use has been increasingly constrained by national regulations and international agreements. In this module, we use a socio-technical approach to explore how the ethics of technology are influenced by the social or economic contexts in which they may be applied (Green, 2021).

In this topic, you will gain knowledge in the following areas:

1. The nature of cyberspace
2. The dimensions of cyber ethics
3. The Fourth Industrial revolution
4. Users' motivation in cyberspace
5. Core values and virtues
6. Cyber ethics by norms, laws and relations
7. Artificial intelligence ethics
8. Cyber capitalism

1.2 THE NATURE OF CYBERSPACE

1.2.1 Interacting in cyberspace

Prescribed reading

Read Section 1.2 on pages 25-26 of Stückelberger (2018) *Cyber society: Core values and virtues*.

The concept of 'cyberspace' refers to an online environment within which Internet technologies are used to support interaction and communication between governments, organisations, communities, and individuals. The U.S. Department of Defence has defined cyberspace as "a global domain within the information environment consisting of the interdependent network of information technology infrastructures and resident data, including the Internet, telecommunications networks, computer systems, and embedded processors and controllers" (Congressional Research Service, 2021; in Garvey, 2021:4).

There are constant interactions between the virtual world of cyberspace and the physical world that we live in. However, cyberspace differs from the physical world in in relation to least seven aspects (Stückelberger, 2018:25-26). The seven aspects are listed and discussed below.

Aspect 1 – Time

The physical time zone in which a human being is located. In cyberspace, information is accessible at any time of day, any day of the week. In the physical world you wouldn't be able to go to a library at 2 am in the morning to read about first aid. Time can also be a drawback in cyberspace. Somebody living in South Africa wanting to communicate online with somebody living in Hong Kong would need to consider the time difference of 6 hours between the two countries.

Aspect 2 – Space

The physical location in which a human being is located. Cyberspace is not bound to a physical location; you do not need to travel to a specific physical location to enter cyberspace. Human beings are however still bound to specific physical locations and not all locations offer access to the Internet.

Aspect 3 – Size

The quantity of information that is produced, as well as the number of human beings that consume information. There is a much higher likelihood of finding information online regarding a very specific topic, as opposed to going to a

bookstore or asking someone in real life. The immense amounts of information available within the cyberspace can be overwhelming. It can be difficult to differentiate between information that is accurate, relevant, and valid, and information that is inaccurate, irrelevant, or untrue.

Aspect 4 - Virtual

Cyberspace is a virtual world. The physical world is material, cyberspace is digital. Cyberspace allows those with disabilities to participate in social activities they might not be able to do in the physical world i.e. someone in a wheelchair taking a virtual tour of Mt. Everest (<https://mount-everest3d.com/>). If the distinction between the virtual and physical world becomes blurred, it can lead to issues such as withdrawing socially from the physical world and internet addiction.

Aspect 5 – Anonymous

Users can choose to assume a different identity, multiple identities or remain entirely anonymous within cyberspace. Anonymity can help enforce privacy and freedom and prevent unwanted tracking of user activities in cyberspace. However, anonymity can also be dangerous, as in cyberspace there is no way of knowing whether the identity of somebody interacting in a virtual environment is genuine, or if that identity has been assumed for fraudulent purposes. This problem is exacerbated by the fact that one person can assume multiple different online identities.

Aspect 6 – Money

The monetary cost associated with interacting in cyberspace. To a large extent, engaging with cyberspace (i.e. interacting with others online, accessing information, and creating/sharing information) is free. Access to cyberspace is however not cost free, an internet connection is required, which is costly. Sub-Saharan Africa has been shown to have the most expensive mobile data plans in the world (Harrisberg et al., 2022).

Aspect 7 - Power

The power structures that are relevant and how they affect the participants. Relative to real life power structures, there are fewer restrictions placed on cyberspace users with regards to where they are allowed to go and what they are allowed to do. In cyberspace the division of power is more equal than in real life. Although cyberspace appears to be open and democratic, power structures may be implicit and hidden. Governments can impose highly restrictive regulations on the activities that their citizens may legally undertake in cyberspace. An example is a law passed by the Philippines in 2022 restricting access to websites that are critical of the ruling party (Funk et al., 2023).

Activity

Cyber risks could threaten the security of your online data or expose your computing devices to intruders. Review the checklist below and identify any security risks that you may currently be exposed to; then briefly outline the steps you would take to reduce those risks.

1. Has your data already been breached? Check whether any of your passwords have been compromised at <https://haveibeenpwned.com/>.
2. Check the strength of your passwords. Replace simple or frequently-used passwords that are based on simple words, phrases or numeric sequences e.g. '1234', 'abcdef' or your first name. Check the security of your passwords at <https://www.security.org/how-secure-is-my-password/> (especially if you use the same password to access multiple apps).
3. Make sure to enable two-factor authentication on all your accounts.
4. Be wary of spam emails that may download viruses on to your computer, and delete attachments sent from unrecognised addresses. Spam emails often attempt to disguise themselves as originating from legitimate institutions such as banks or trusted online retailers.
5. Secure your devices by installing anti-virus software, disabling automatic connection to nearby networks, using a virtual private network and using a password to lock your device when it is not in use.
6. Do not reveal sensitive information to unknown parties online. This includes personal details such as your age, your location, banking details and passwords.

1.3 THE DIMENSIONS OF CYBER ETHICS

1.3.1 Ethics domains in cyber space

Prescribed reading

Read Section 1.3 on pages 26-27 of Stückelberger (2018) *Cyber society: Core values and virtues*.

Ethical issues that have previously been identified and addressed in our physical world have corresponding equivalents in the cyber world. Six key dimensions of

cyber ethics are identified by Stükelberger (2018:26-27), together with their associated applications and impacts:

1. Life Ethics: This addresses life between birth and death; it includes health ethics, bioethics, ageing, health care and telemedicine. Artificial intelligence has been successfully applied to tasks such as disease diagnosis (Horiuchi *et al.*, 2024) and synthesizing new medicines (Hasselgren *et al.*, 2024). The use of AI can increase access to quality healthcare for previously disadvantaged populations. Concerns over a lack of transparency in AI tools and the potential for false positives or false negatives when using AI tools for diagnosis make the use of AI in healthcare a contentious ethical issue.
2. Community Ethics: This includes positive aspects of social media, community life and global communication; and negative or abusive aspects such as cyber bullying. During the 2020 COVID-19 pandemic online communities played a key role in fulfilling social needs during extended periods of isolation (Cho *et al.*, 2023). However social media has been proven to have a negative impact on mental health, with platforms like Instagram being directly linked to worsening self-esteem issues in young women and girls (Scully *et al.*, 2020).
3. Environmental Ethics: This includes positive impacts of scientific research on e.g. environmental management; and negative impacts of technology on energy use, environmental degradation, etc. Artificial intelligence has been shown to be useful for monitoring and tracking trends relating to the protection of endangered species (Wang *et al.*, 2024) and climate change (Shaamala *et al.*, 2024). AI technologies must be made environmentally friendly by using green/renewable energy sources. If the carbon footprint of AI technologies is not consciously considered, environmental threats such as global warming and deforestation can be exacerbated (Marr, 2023).
4. Political Ethics: This deals with changes in political systems, elections, security and military threats, and the need for cyberspace regulation on international and national levels. Social media can be weaponised to maliciously spread misinformation (Lim *et al.*, 2024) or leak sensitive government information (Al Jazeera, 2023). The intention behind leaking information or using social media for political discourse can also be positive, as is the case when whistleblowers publish sensitive information to expose illegal activities.
5. Economic Ethics: This deals with the positive and negative impacts of cyberspace on economic growth, job creation or job losses, and financial investments in cyber research. The positive economic impact of a rapidly

expanding cyber world is seen in the creation of new online-only jobs, such social media content moderators or traditional jobs shifting from the physical world to the cyber world i.e. online therapy or online distance learning. The use of technology, in particular AI to automate jobs that were previously performed by humans, is a cause for concern, as there is the potential for large scale job loss (Willing, 2023).

6. Cultural and Religious Ethics: This focuses on the positive impact of cyberspace on cultural and language diversity; as well as the negative impacts of discrimination, religious intolerance, and hate speech. Language learning is greatly enhanced by cyberspace, as it allows for native speakers of a language to talk to those attempting to learn the language, even if they are situated in a different country.

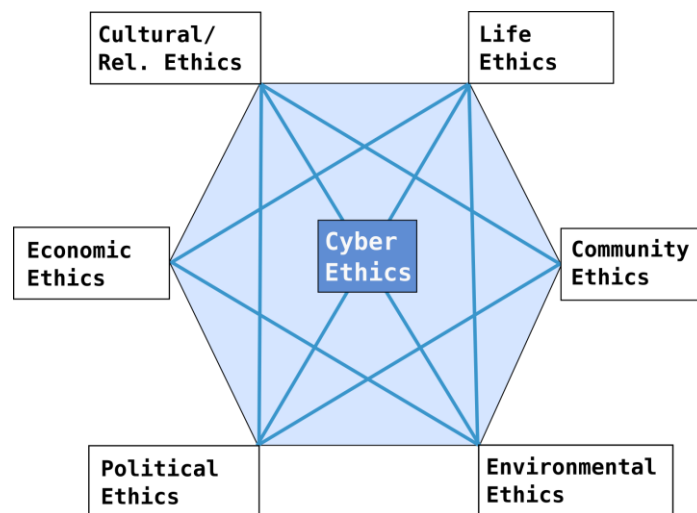


Figure 1.1: The relationships between six different aspects of cyber ethics (Stückelberger, 2018:26)

Figure 1.1 illustrates the multi-faceted relationships between six different ethical domains (Stückelberger, 2018:26). Each of these relationships has the potential to be used for either ethical or unethical purposes, and it is up to each of us to create and maintain an honest and trustworthy cyberspace.

Activity

Make a list of the six different ethical dimensions identified in Figure 1.1 above and rate them from 'most important' to 'least important', based on their relevance to your own personal priorities and the activities that you participate in. Write down at least one reason for your rating of each dimension.

1.4 THE FOURTH INDUSTRIAL REVOLUTION

1.4.1 The ethics of new technologies

Prescribed reading

Read Section 1.4 on pages 27-31 of Stükelberger (2018) *Cyber society: Core values and virtues*.

The growth of the Internet and the proliferation of advanced computing technologies have led to new ways of communicating and interacting online. As a result, our thinking and behaviour is influenced by the virtual world of cyberspace, which in turn affects our relationships, environments, cultures, and politics. This development has given rise to a phenomenon referred to as the Fourth Industrial Revolution (Stükelberger, 2018:27-30). To contextualise the Fourth Industrial Revolution, we must look back at the effects of the First, Second and Third Industrial Revolution on society.

Prior to the The First Industrial Revolution, humans were organised in tribes. Members of the tribe focused on converting the land the tribe chose to settle on into land that was viable for agricultural practices. The First Industrial Revolution occurred during the late 1700s and early 1800s and resulted in large scale industrialisation based on the use of steam power to support iron and textile production. (Wikipedia. n.d. *Industrial revolution*.)

The Second Industrial Revolution lasted from 1870 to 1914 and stimulated rapid economic growth because of standardisation, mass-production, and industrialisation. New steel-making processes, machine tools and assembly lines were key elements of new automated processes. (Wikipedia. n.d. *Industrial revolution*.)

The Third Industrial Revolution refers to the period during the second half of the 20th century (1950s) and the early 21st century when digital computing and communication technologies became widely available to organisations and individuals. These technologies gave rise to the birth of the Internet as well as technological tools such as automated teller machines, mobile phones, and digital cameras. The creation of the World Wide Web was a further key development. Negative impacts of these advancements include information overload, invasion

of privacy, hacking, copyright issues and damage to the environment caused by electronic waste. (Wikipedia. n.d. *Digital revolution*.)

The Fourth Industrial Revolution refers to the period during the 21st century. The catalyst for the Fourth Industrial Revolution is not one single event, but rather a combination of different advancements. Increased connectivity, smart automation enabling the integration of value chains, the digitisation of products and services, and the development of new business models are all features of this period. Other features include the proliferation of mobile devices, smart sensors, location detection technologies, big data analytics, and predictive maintenance. These developments require large capital investments and come with associated risks such as breaches of data security, invasion of privacy, and unemployment due to automation. (Wikipedia. n.d. *Fourth industrial revolution*.)

Until recently, the impact of disruptive technologies on social relations, markets and existing business models had not been extended to include less technical domains such as human relations and social life (Hopster, 2021). However, Schuelke-Leech (2018; cited in Hopster, 2021:3) distinguishes between two levels of technological disruption: first-order disruptions reflect localised changes within a particular market or industry; and second-order disruptions affect social relationships, organisational structures, public policies and the physical environment.

Surprisingly, human knowledge and moral norms have not been included in Schuelke-Leech's analysis. The values-technology-regulation model (shown in Figure 1.2) also referred to as the triadic model (Hopster *et al.*, 2023) attempts to address this.

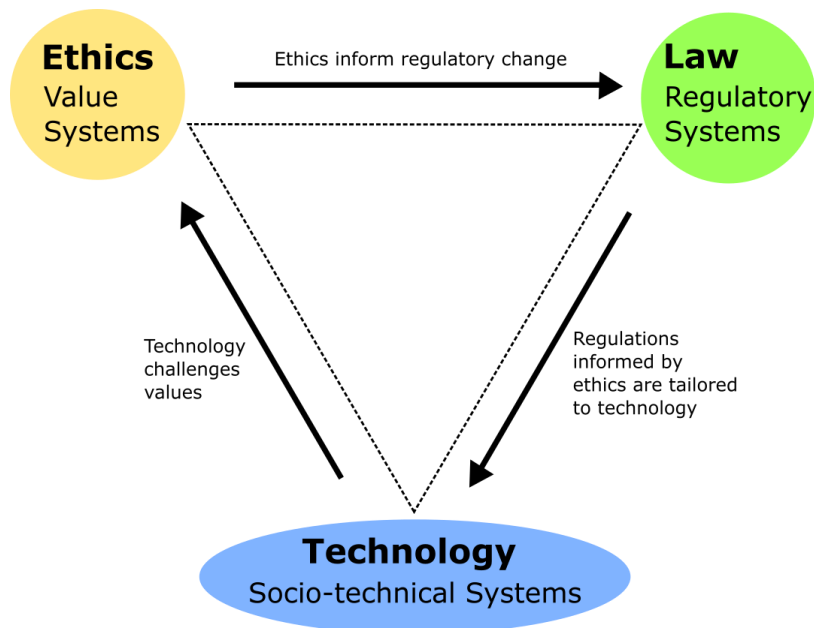


Figure 1.2: Triadic values-technology-regulation model (Hopster et al., 2023)

The triadic model shows how technological disruptions can challenge existing value systems and morals. Value systems and morals are what comprise ethics. Ethics are used to create and change regulatory systems i.e. laws. The regulations that are informed by ethics can subsequently be tailored to apply to technology.

Hopster (2021:4-5) claims that because current AI and machine learning technologies fail to take into account issues of human agency, individuality, autonomy, and creativity, they cannot adequately accommodate the relationship that exists between a particular technology and the context within which it will be implemented. Instead, Hopster argues in favour of techno-social disruption, which takes into account the impact of technology on social life, human experience, human nature and political contexts. COMEST (2019:8) states that the use of AI has substantial societal implications including risks related to information bias and threats to cultural diversity, and as a result, AI-based decisions should be treated with caution.

The brief analysis provided above reflects a combination of technology-related benefits and associated risks. However, we need to bear in mind that technology is only a tool, and it is the responsibility of individual human beings to use the new technologies in ways that will enhance our quality of life.

Activity

Create a list that includes two positive impacts and two negative impacts of the Fourth Industrial Revolution, and briefly describe how each of those impacts has influenced South African society in particular.

1.5 USERS' MOTIVATION IN CYBERSPACE

1.5.1 Freedom versus regulation in cyberspace

Prescribed reading

Read Sections 1.6 and 1.7 on pages 32-36 of Stükelberger (2018) *Cyber society: Core values and virtues*.

In cyberspace, the actions of individuals may have an ethically positive (constructive) or negative (destructive) impact. Positive impacts include access to online education, maintaining close relationships with family and peer groups, and establishing a professional identity; while negative impacts include cyber bullying, digital addiction and religious/violent extremism.

Cyber-citizenship helps to aid in guiding individuals to have ethically positive impacts in cyberspace. Cyber-citizenship according to Fonseca and Bettencourt (2019) means "...digital literacy, embodied in the development of an autonomous, critical and responsible conscience" with cyber-citizens being able to "...work in the cyber world, be able to identify any dangers that this imposes and be able to know their rights and duties in this environment...".

Cyber-citizenship has been shown to significantly reduce instances of online bullying behaviour (Hussain *et al.*, 2021) and a report by Reynolds and Scott (2015:105) concludes that cyber-citizenship can help temper violent extremism online. However, safeguarding against digital addiction requires more than just cyber-citizenship practices. Research by Cemiloglu, Almourad, McAlaney and Ali (2022) analysed the results of 87 studies focusing on digital addiction, most of which used cognitive behavioural therapy to increase participants' self-awareness of the triggers that contribute to their addictive online behaviours. Interventions were aimed specifically at influencing the digital behaviour of high school students aged 12-17 and focused on the development of coping strategies such as self-regulation, good sleep habits, understanding the role of family dynamics and communicating effectively with others. Students also had access to a website where they could learn more about internet addiction, receive

feedback about their digital usage and learn to develop appropriate coping mechanisms (Cemiloglu *et al.*, 2022:1-5).

1.5.2 Core values and virtues

The “new” form of cyberspace that emerged from the Fourth Industrial Revolution (sometimes referred to as Cyber Ethics 4.0) attempts to define an ethical vision of human society by interpreting old values in a way that can be applied to new situations. Stückerberger (2018:35) encourages adherence to a balanced system of inter-connected values and virtues, based on the principles listed below:

1. Freedom: Use cyberspace with responsibility and accountability.
2. Justice: Enable fair, just and equitable use of cyberspace.
3. Equity: Promote Internet Governance with equal rights.
4. Peace: Support “just” cyber warfare and promote just peace.
5. Security: Respect the obligation to protect and the right to forget.
6. Inclusiveness: Reduce the gap between the digitally skilled and unskilled.
7. Privacy: Protect private spheres and rights, e.g. limit access to big data.
8. Dignity: Protect and promote the dignity of every human being.
9. Participation: Enable participation of all in pricing and laws.
10. Honesty: Promote transparency in relation to technology and law.
11. Integrity: Defend constructive values and build trust based on honesty.

Activity

List the three ethical values that you think are most threatened by the technological disruption posed by artificial intelligence.

1.6 CYBER ETHICS BY NORMS, LAWS AND RELATIONS

1.6.1 Legal norms, ethical values and relation-based decisions

Prescribed reading

Read Sections 1.8 and 1.9 on pages 38-42 of Stükelberger (2018) *Cyber society: Core values and virtues*.

In this section we consider how legal norms, ethical values and relation-based decisions contribute to the development of self-responsibility and self-regulation within communities and among individuals. To support the concept of an ethical cyber space a balance is needed between these three dimensions (Stükelberger, 2018:38).

The *Rules of Ethics* underpin a vision of the future that emphasises shared community values. In societies that rely predominantly on laws and regulations, relations and individual/collective ethical values need to be strengthened.

The *Rules of Law* focus on issues such as trust, reliability, and the control of power, and are intended to maintain and strengthen the status quo. In societies that do not respect of the rules of law, the implementation of the law needs to be strengthened.

The *Rules of Relations* are intended to support humane relationships between individuals and communities. In societies where individualism is exaggerated and there is little sense of community, the rules of relations need to be strengthened.

Stükelberger (2018:39-40) outlines a hierarchy of levels related to the binding character of norms, as illustrated in Figure 1.3. These progress from implicit fundamental premises at the lowest level; to the fundamental values and virtues listed in Section 1.5.2 above; to contextual values such as national laws and ISO standards; and finally, to discretionary decisions that focus on specific areas of application, such as the use of computer technology to support advanced applications including artificial intelligence and robotisation.

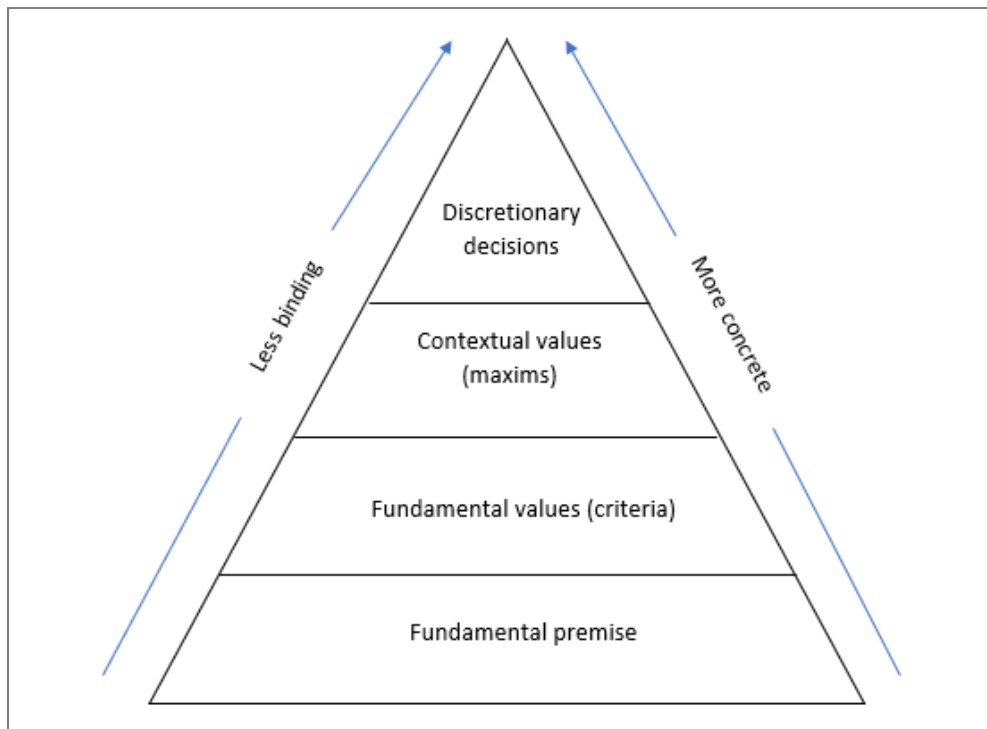


Figure 1.3: The relationships between ethical values and legal norms (Stückelberger, 2018:38)

1.6.2 Sustainable Development Goals

The United Nations' Sustainable Development Goals (SDGs) are a set of 17 multi-faceted world development goals intended to further peace and prosperity. The 17 SDGs are:

1. No poverty
2. Zero hunger
3. Good health and well-being
4. Quality education
5. Gender equality
6. Clean water and sanitation
7. Affordable and clean energy
8. Decent work and economic growth
9. Industry, innovation and infrastructure
10. Reduced inequalities
11. Sustainable cities and communities
12. Responsible consumption and production
13. Climate action
14. Life below water
15. Life on land
16. Peace, justice, and strong institutions

17. Partnerships for the goals

In the context of Figure 1.3, the SDGs are located within the hierarchical level that includes national laws and ISO standards. The SDGs are based on a set of core ethical values, and all cyber-related activities are measured against the benchmark of the SDGs (Stückelberger, 2018:41-42). The Sustainable Development Goals aim to achieve the following objectives:

1. A guarantee of basic human needs, by ending extreme poverty and achieving food security (SDGs 1, 2).
2. Ensuring healthy lives and providing quality education (SDGs 3, 4).
3. Equality of all human beings, including gender equality (SDG 5).
4. Ensuring access to clean water and sanitation, affordable energy and productive employment (SDGs 6, 7, 8).
5. Infrastructure development and the reduction of income inequality, provision of safe housing and basic services (SDGs 9, 10).
6. Provision of safe housing and basic services (SDG 11).
7. Responsible consumption and production (SDG 12).
8. Climate action, sustainable use of marine resources and sustainable management of ecosystems (SDGs 13, 14, 15).
9. Promote peaceful and inclusive societies, provide access to justice for all, build global partnerships for sustainable development (SDGs 16, 17).

Activity

The United Nations provides a dashboard that tracks the progress of each country towards achieving each one of the 17 Sustainable Development Goals (see: <https://dashboards.sdgindex.org/profiles>). With reference to the dashboard mentioned, write down the three Sustainable Development Goals that you think are most important for South Africa to focus on in the next five years and briefly explain your reasoning.

1.7 ARTIFICIAL INTELLIGENCE ETHICS

1.7.1 Using Artificial Intelligence for good

Prescribed reading

Read Sections 1.10 and 1.11 on pages 42-44 of Stückelberger (2018) *Cyber society: Core values and virtues*.

Artificial Intelligence (AI) is expected to make important contributions towards the use of new technologies in areas such as health and education services, monitoring food and water quality, maintaining peace within communities and nations. However, cyber technologies may also be used to commit cybercrime or attack organisations and governments. Clear limitations, regulations and laws need to be defined to limit any potential abuse (Stückelberger, 2018:42).

Galaz, Centeno, Callahan, Causevic, Patterson, Brass, Baum, Farber, Fischer, Garcia, McPhearson, Jiminez, King, Larcey and Levy (2021:1-10) discuss potential applications of AI in sustainable industries such as agriculture and the harvesting of marine resources and identifies several associated risks. They claim that although AI technologies can contribute to more effective use of natural resources, attention must be paid to issues of sustainability and the social, economic, and ecological impacts. They draw attention to four risks:

Risk 1: Unintended negative consequences caused by algorithmic biases

Algorithmic biases can result from using inadequate data sets for AI training; from transferring existing AI systems to different contexts with different requirements; or from the misinterpretation of data that has been generated by an AI system (Galaz et al., 2021).

Risk 2: Unequal access, benefits, and impacts

The use of AI technologies in farming can increase crop yields and improve resource efficiency, but these benefits accrue only to large-scale farmers who can afford to automate their processes and reduce labour costs. Most small-scale farmers cannot afford the cost of the modern technologies needed to for automation. Small-scale farmers perform a useful social function by employing seasonal workers to supplement their own employees (Galaz et al., 2021).

Risk 3: Shocks, cascading failures, and attacks

'Distributed AI' has been suggested as a way to support the interactions that occur between humans, machines, and ecosystems. The complex systems controlling these interactions are susceptible to failure, and an unexpected breakdown would disrupt the operation of affected farms and have a detrimental ecological impact (Galaz et al., 2021).

Risk 4: AI, efficiency, and resilience

Holling and Meffe (1996; cited in Galaz et al., 2021) note that "optimizing system performance to maximize efficient generation of a small set of goods (say, a particular crop), often undermines overall system functioning and resilience over the long term". Reduced environmental diversity makes ecosystems less resilient and short-term gains in efficiency may negatively affect the ecosystem, making it vulnerable to adverse weather conditions or predatory insects. Evidence suggests that smaller farms are likely to be more productive and diverse, based on local knowledge and generations of farming experience (Galaz et al., 2021).

1.7.2 Guidelines for the ethical use of AI

In 2018, the European Union Commission established a high-level group on AI which has prepared draft ethics guidelines that will uphold fundamental rights of privacy and data protection, human dignity and non-discrimination. Increasing attention has been paid to the topics of AI and Ethics, and the Governance of AI, at all levels from the private sector to national governments (Stückelberger, 2018:43). More recently in 2022 the United Nations Educational, Scientific and Cultural Organization (UNESCO) released recommendations regarding the ethical use of AI. The recommendations contains principles that need to be adhered to at all stages of the artificial intelligence lifecycle, these are listed below:

1. Proportionality and Do Not Harm
2. Safety and security
3. Fairness and non-discrimination
4. Sustainability
5. Right to Privacy and Data Protection
6. Human oversight and determination
7. Transparency and explainability
8. Responsibility and accountability
9. Awareness and literacy

Activity

Artificial intelligence can lead to scenarios that cause ethical dilemmas. Together with a partner, select one of the ethical dilemmas outlined below and give your opinion on the ethical dilemmas posed by each scenario.

Scenario 1: Autonomous cars

These vehicles rely on multiple sensors and intelligent algorithms to navigate safely through traffic; but if two autonomous cars, using the exact same AI technology, were to be involved in an accident, who would be responsible for the accident? Who should financially carry the burden of paying the insurance costs?

Scenario 2: AI-based art

Generative artificial intelligence can generate any image given a text prompt explaining what the image should contain. For example, a painting of a sunset over the ocean or a photo of a flower. However the images that were used to train the AI tool belongs to various artists, who have legal copyright over the images. Who would hold the copyright to the image generated by the AI tool? Can an AI tool be recognised as an author?

1.8 CYBER CAPITALISM

1.8.1 Cyber-ethics as business ethics

In the cyber world, the three classical production factors (natural resources, human labour, and capital) have been supplemented by a fourth factor: Big Data. The data that is most valuable to businesses is data that describes user demographics and behaviours in cyber space. Users consent to storage of personal data, as well as data regarding their activities when using cyber platforms such as social media, instant messaging, online shopping and more.

User data is only becoming more valuable as time goes on, with the ability to train artificial intelligence models being only one of many uses for said data. Data brokers are unscrupulous companies that "...collects, buys, and analyses personal data and sells it to other companies or groups, which use that

information to target messages and advertisements or sell products.” (Ryan-Mosley, 2024). Data brokers operate in a grey area of legality; however legislation is slowly catching up to restrict and regulate the selling of user data. Laws such as the General Data Protection Regulation (GDPR, 2018) in Europe as well as its South African counterpart, the Protection of Personal Information (POPI, 2021) Act aim to curb the misuse of user data and allow users control over who is allowed to access and retain their data. Companies must actively consider how they can not only legally, but also ethically manage the data entrusted to them by users. Segalla and Rouziès (2023) suggest a framework called “The Five Ps of Ethical Data Handling” as a starting point for companies:

1. Provenance: The origin of the data needs to be known and the data needs to have been acquired legally and with full consent of the user.
2. Purpose: Is the data being used in the way that the user consented to, or is the data being repurposed and used in a way that is different from what the user originally consented to?
3. Protection: Is the data being protected with regards to how it is stored and transferred? Is the data only going to be kept for a certain period of time, and if so, who will be responsible for destroying the data after the period has lapsed?
4. Privacy: The data needs to be sufficiently anonymized before it is used and record must be kept of who has access to the data before and after it is anonymized.
5. Preparation: The techniques that are used to process the data i.e. whether certain values are removed or added needs to be documented. The accuracy and validity of the data may also need to be verified.

Important technologies that facilitate capitalism in cyber space using big data include fintech and blockchain technology. Fintech is flourishing in South Africa with companies like Yoco (<https://www.yoco.com/za/>) and TymeBank (<https://www.tymeBank.co.za/>) being widely used in finance, banking, and currency transactions. Blockchain technologies are used to enable a ‘democratic’ financial system that has been adopted by some telecom industries, supply chain traders, insurance and shipping companies, and banking consortia. Luno (<https://www.luno.com/en/za>) is an example of a South African company making use of blockchain technology in the form of cryptocurrency.

Cyber ethics does not only concern technology, it also encompasses economic, political and military ethics. A lack of cyber ethics may lead to worsening inequality, the exploitation of human workers, the restriction of access to users’ own data, and over-regulation of economies (Stückelberger, 2018:49-51).

Turja, Särkikoski, Koistinen and Mellin (2022:1-3) investigated the impact of increased robotisation on the job satisfaction levels of employees that perform routine service tasks. Their findings show that robotics increased productivity but had a negative effect on employees' perception of their future job satisfaction. Turja *et al.* (2022) explains that employees may believe that their jobs are under threat as service tasks are increasingly being performed by robotic technologies. They concluded that before robotisation is introduced within a particular environment, employers should ensure that employees retain responsibility for their own work and are given opportunities to develop new competences (Turja *et al.*, 2022:8).

Artificial intelligence can also be detrimental to those that help create it. Kenyan workers were recruited to help increase the safety of the wildly popular ChatGPT chatbot. To ensure the safety of users, ChatGPT must reject harmful, violent or explicit inputs and conversely may not produce unacceptable outputs either. Workers were required to manually review harmful, violent and explicit data to be able to provide ChatGPT with examples of inputs and outputs that were unacceptable. Workers reported serious negative psychological and mental effects after reviewing mass amounts of harmful content (Hao *et al.*, 2023).

Activity

Consider a scenario where a popular local grocery store decides to implement an automated cashier system. Working with a partner, suggest ideas for how workers that were previously employed as cashiers can be retrained for a different position in the company.

1.8.2 Recommendations

1. Education

- 1.1. Establish an ethical framework of values and virtues within cyberspace.
- 1.2. Provide compulsory media education on values and virtues.
- 1.3. Strengthen the responsibility of individual consumers.

2. Regulation

- 2.1. Agree internationally on governance structures for global cyber-related technologies, including AI and Blockchain.

- 2.2. Formalise ethics committees as national and international cyberspace regulatory bodies.
- 2.3. Equip police and courts with trained specialists in cybercrime and cybersecurity.
- 3. Politics
 - 3.1. Guarantee human rights in cyberspace;
 - 3.2. Eliminate corrupt practices from police services and courtrooms.
 - 3.3. Refrain from using cybersecurity policies to control the behaviour of citizens.
 - 3.4. Monitor and control the activities of national intelligence agencies.
- 4. Economy
 - 4.1. Determine appropriate models for financing a values-driven cyberspace.
 - 4.2. Balance technological innovation with transparent and ethical research standards.
 - 4.3. Establish decentralised and democratic regulation mechanisms.

Summary

IT-based components and processes that are located in cyberspace facilitate human interaction across time zones and national boundaries. However, there are a number of challenges associated with cyber transactions, including uncertainty as to the accuracy and validity of online information, exposure to scammers or other individuals who assume fraudulent online identities, and restrictions that may be imposed by undemocratic governments wanting to limit their citizens' access to global information. In addition, undesirable behaviours such as bullying, hate speech and racial or religious intolerance are easily transferred into cyberspace, where the identity of perpetrators can be easily hidden.

During the 21st century, the fourth industrial revolution saw the rapid growth of new digital technologies that enabled process automation and value chain integration, as well as the use of data analytics for predictive modelling. This was followed by the adoption of IT technologies to support activities ranging from online employment to social interactions; a development that was accompanied

by risks such as digital addiction, online bullying, fraud, and political or digital extremism. Stükelberger (2018) then discusses the balance between the rules of Ethics, Law and Relations, and draws attention to the United Nations' Sustainable Development Goals.

Artificial intelligence-based technologies have the potential to support initiatives such as the monitoring of water quality and the delivery of healthcare advice or educational materials in remote areas. However, developing countries may be unable to afford the cost of such technologies; and countries that adopt the new technologies may see increasing levels of unemployment as well as negative impacts on the local ecosystem. In industrialised nations, growing use of automation and robotisation in the workplace has led to the retrenchment of factory workers, many of whom have struggled to find subsequent employment.

Self-Assessment Questions

Write an essay of approximately 350-450 words based on each of the topics outlined below:

1. AI tools such as ChatGPT have been shown to be able to pass the bar exam (Arredondo, 2023). According to UNESCO AI could help to create a fairer judicial system by making informed decisions that are not influenced by bias or subjectivity. Discuss this statement in relation to the issues raised in paragraphs 76, 79, 80 and 87 of the report entitled "European ethical charter on the use of artificial intelligence in judicial systems and their environment" (CEPEJ, 2018), and paragraphs 50 and 51 of the report entitled "Preliminary study on the ethics of Artificial Intelligence" (COMEST, 2019).
2. Turja, Särkikoski, Koistinen and Mellin (2022) investigated the impact of robotisation on the job satisfaction levels of employees responsible for performing routine service tasks. They found that non-robotised workplaces were more effective than robotised workplaces at meeting the psychological needs of workers. Discuss this outcome in relation to Maslow's 'Hierarchy of Needs' theory, and the psychological impact on employees who may believe that their jobs are under threat (For an overview of Maslow's "Hierarchy of Needs" theory, refer to Hopper (2020)).

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