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Towards an *Ubuntu/Botho* ethics of technology

By

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DECLARATION

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Declaration

1. I understand what plagiarism is and am aware of the University's policy in this regard.

2. I declare that this thesis is my original work. Where other people's work has been used either from a printed source, Internet or any other source, this has been properly acknowledged and referenced per departmental requirements.

3. I have not used work previously produced by another student or any other person to hand in as my own.

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Date: 26 September 2023

Place: Pretoria North

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One of the questions I often receive is why am I pursuing to study Theology and Technology and I often struggle to answer the question. Not because I do not know the answer but because I grew up and was influenced by the '90s and early 2000s culture. This was the era when the internet was introduced and developed in the world, and the era of popular video games, music, movies, and mobile phones. Those were the years I navigated the world of technology and my surroundings in the township. One of my biggest influences in the 90s and early 2000s culture is my brother Itumeleng, he was the one who introduced and taught me how to use a computer and play video games. I therefore want to thank my parents, my mother Emily Mokoena and late father Paulus Mokoena for bringing me into this world and raising me very well. I also want to thank my siblings Jones, Sebolelo, Maureen, Johnathan, Sylvia, Itumeleng, Refiloe, and my late brother Tshepo for being part of my upbringing because as the last born in the family they contributed to my relationship with technology, music, and film in one way or another.

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This thesis is dedicated to my son, Tlotliso, as this research is hopefully a contribution to a more just future where he can grow up.

ABBREVIATIONS

3-D printing - Three-dimensional printing

4IR - Fourth Industrial Revolution

5G - Fifth-generation mobile technology

5IR - Fifth Industrial Revolution

ACHPR - African Commission on Human and Peoples' Rights

ACLU - American Civil Liberties Union

AI - Artificial Intelligence

AIC - African Initiated Churches

AIKS - African Indigenous Knowledge Systems

AR - Augmented Reality

ATR - African Traditional Religion

AU - African Union

AV - Augmented Virtuality

AWS - Amazon Web Services

BTL – Black Theology of Liberation

CAC - Cyberspace Administration of China

CAHAI - Ad Hoc Committee on Artificial Intelligence

CAIDP - Centre for AI and Digital Policy

CCW - Convention on Certain Conventional Weapons

CDEP - Committee on Digital Economy Policy

CIRCLE – Circle of Concerned African Women Theologians

CoE - Council of Europe

COVID-19 - Coronavirus disease 2019

CRISPR - Clustered Regularly Interspaced Short Palindromic Repeats

CTA - Christian Transhumanist Association

EES - Extended Evolutionary Synthesis

EU - European Union

EU AI ACT - European Union Artificial Intelligence ACT

EU-US - European Union - United States

G20 - Group of twenty (nations)

G7 - Group of seven (nations)

GDPR - General Data Protection Regulation

GGE - Group of Governmental Experts

GPAI - Global Partnership on AI

GPT - Generative Pre-trained Transformer

IBM - International Business Machines

ICT - information communications technology

IKS - Indigenous Knowledge Systems

IoT - Internet of Things

IQ - Intelligence Quotient

LAWS - Lethal Autonomous Weapons Systems

LLM - Large Language Model

MIT - Massachusetts Institute of Technology

ML - Machine Learning

MX - Mixed Reality

NBC - National Broadcasting Corporation

NGO - Non-Governmental Organization

NLP - Natural Language Processing

OECD - Organization for Economic Co-operation and Development

ONE PAI - OECD Network of Experts on AI

ORA - Office of Responsible AI

PC4IR - Presidential Commission on the 4th Industrial Revolution

RAISE - Responsible AI Strategy in Engineering

RFID - Radio Frequency Identification

SARS – South African Revenue Services

SDGs - Sustainable Development Goals

SMEs - Small and Medium Sized Enterprises

TERS - Temporary Employee/Employer Relief Scheme

TTC - Trade and Technology Council

UIF - Unemployment Insurance Fund

UN - United Nations

UNESCO - United Nations Educational, Scientific and Cultural Organization

UNICR - United Nations Interregional Crime and Justice Research Institute

UNODA - United Nations Office for Disarmament Affairs

VR - Virtual Reality

WEF – World Economic Fund

WHO - World Health Organization

WTA - World Transhumanist Association

ABSTRACT

Humanity and technology have been in co-evolution and co-development in human history and it has been an intricate part of our daily lives today. However, since the Industrial Revolution, technology has had a negative impact, especially in the African context. The 4IR poses questions if emerging technologies such as AI will continue to have a negative impact in Africa or if Africa will harness its power to compete in the global economy. There have been many global discourses about AI in how it can change socio-economic structures and our way of life. This study investigates technology as power and the landscape of global AI ethics. It emphasised that AI ethics should take into consideration the historical impact of technology in Africa to establish patterns as emerging technologies are not in isolation from history. This study used a critical literature review methodology and decoloniality as a theoretical framework. It used an interdisciplinary study of technology and *Ubuntu* ethics from an African theological and philosophical perspective. This study identified that the global AI ethics discourse is dominated by Western ethics which embed universalism. This study highlighted that universalism is an imposition as AI does not impact countries the same way and a one-size-fits-all ethical approach is incompatible. The study argued that African ethical perspectives such as *Ubuntu* are appropriate in the African context to deliberate on the impact of AI. This study also identified that the current AI ethics discourse emphasizes the impact of AI on humanity and less or not at all on its impact on spirituality and the environment. This study contributed a holistic *Ubuntu* AI ethics approach that includes humanity, spirituality, and the environment in the African context generally and South Africa specifically.

KEYWORDS

African Epistemology	African epistemology refers to the distinct ways of knowing, comprehending, and acquiring knowledge that is anchored in African societies' different cultural, spiritual, and historical backgrounds.
African Philosophy	African philosophy explores existence, ethics, knowledge, and reality from an African perspective, incorporating indigenous beliefs, values, and historical experiences.
African Theology	Theological views, beliefs, and practices formed within the framework of African cultures and experiences are referred to as African theology.
Algorithmic coloniality	Algorithmic coloniality perpetuates power imbalances, cultural biases, and socioeconomic inequalities through digital algorithms and technology, causing unfair practices and reinforcing systemic injustices in data collection, AI decision-making, and digital access.
Artificial Intelligence (AI)	AI refers to the development of computer systems and/or software capable of performing tasks requiring human intelligence, such as problem-solving, learning from experience, and decision-making, without explicit programming.

Decolonial AI	Decolonial AI aims to address biases, inequalities, and cultural hegemony in AI systems by challenging Western-centric perspectives and respecting diverse worldviews. It involves reexamining data collection, algorithm design, and decision-making processes for equitable solutions.
Decoloniality	Decoloniality is a critical framework challenging colonialism's impact on cultures, societies, and knowledge systems. It focuses on marginalized groups' perspectives, voices, and experiences, promoting self-determination, cultural autonomy, and social justice.
Emerging technologies	Emerging technologies are innovative advancements gaining prominence such as AI, biotechnology, nanotechnology, blockchain, quantum computing, and renewable energy; and transforming areas like science, industry, and society.
Ubuntu ethics	*Ubuntu* ethics is rooted in African philosophy and emphasizes holistic interconnectedness and well-being of humanity, spirituality, and the environment.

CHAPTER 1

INTRODUCTION: HUMANITY, TECHNOLOGY, AND ETHICS

1.1 INTRODUCTION

Technology is an intricate part of our daily lives and it is almost impossible to live without it. It is what we use to communicate, do personal, educational and work tasks, access information, solve problems and travel. Technology, however, has a long history in human civilizations from pre-history to the present age (McNeil 1990). In other words, the history of technology stretches from basic stone tools to more complex emerging technologies such as artificial intelligence (AI). The intrinsic relationship between humans and technology is that of altering the world essentially for their benefit. In the book chapter on *the interaction of ethics and technology in historical perspective*, Mitcham and Briggle (2009:1148) make the following statement:

> Plants and animals alter the world by selectively ingesting materials from the environment, transforming them, and excreting newly formed materials. For a few animals, however, their own existence depends crucially on altering the world in more determinate ways. Spiders spin webs; birds build nests; beavers construct dams; and chimpanzees fashion tools. For no animal, however, is the making and using of physical objects more crucial to their lives and livelihood than for human beings, who make and use clothing, shelter, utensils, tools, utilities, weapons, structures, cities, transport and communication systems, and more, all as part of their distinctive way of being in the world — a way of being that differentiates into multiple traditions of material culture. (Mitcham and Briggle 2009)

It can be argued that although humans have altered the world by using stones as tools and fire as a key survival technology, technology today also alters us with communication technologies that have connected us and increased information (Headrick 2009). Jasanoff (2016: 8) mentions that the word "technology" is complex as it is unspecific. There is not one prescriptive definition agreed upon as it is difficult to grasp its essence entirely (Misa 2009). It covers an astonishing diversity of tools and instruments, products, processes, materials, and systems. A composite of Greek *techne* (skill) and *logos* (study of), "technology" in its earliest usage, back in the seventeenth century, meant the study of skilled craft. Only in the 1930s did the word begin to refer to objects produced through the application of *techne* (Jasanoff 2016).

One of the most influential Western texts on technology – is the article by Heidegger *on Technology* (Heidegger 1977). Heidegger's philosophy on technology prompts us to contemplate the effects of technology on human life, our relationship with our surroundings, and the necessity of a conscious involvement with technology to uphold our integrity and humanness. Brown (2019) states that the definition of technology and how it is understood is varied. The most frequent perception of technology is that it is an artefact or a device. Li-Hua (2009:18) argues that technology is not limited to hardware such as tools, machines, and equipment but also skills, knowledge, experience, and organization. Thus, many forms of technology exist, from simple to complex. The limits of technology are endless as humanity keeps achieving complex milestones with technology at a more rapid pace than ever before.

To track how technology has dramatically altered socioeconomic structures in different eras, scholars have thematically observed technology according to Industrial Revolutions (Britannica 2022). According to Schwab (2016), the word “revolution” denotes an abrupt and radical change. Revolution in this sense means new technologies creating profound change in economic systems and social structures. Schwab (2016: 11) briefly elaborates on the three previous Industrial Revolutions:

> The First Industrial Revolution spanned from about 1760 to around 1840. Triggered by the construction of railroads and the invention of the steam engine, it ushered in mechanical production. The second industrial revolution, which started in the late 19th century and into the early 20th century, made mass production possible, fostered by the advent of electricity and the assembly line. The Third Industrial Revolution began in the 1960s. It is usually called the computer or digital revolution because it was catalysed by the development of semiconductors, mainframe computing (1960s), personal computing (1970s and 80s) and the internet (1990s) (Schwab, 2016).

This study focuses on the Fourth Industrial Revolution (4IR or Industry 4.0) which began at the turn of this century and builds upon the digital revolution. The 4IR is marked by a variety of new technologies such as a more ubiquitous mobile internet, smaller and more powerful sensors, AI, and machine learning. It is also characterized by other breakthroughs, including gene sequencing, nanotechnology, renewables, and quantum computing (Schwab, 2016). This revolution is distinct from past ones

due to the innovation, speed and breadth of its diffusion across the physical, digital and biological domains (Schwab, 2016). Although there are current deliberations on the 5IR, its definition and key differences from the 4IR have not yet been clearly defined (Noble et al. 2022). Therefore, the focus of this study will be on emerging technologies within the 4IR such as AI.

An aspect of technology is that it embodies power. Technology is both a tool and a source of power. Power is defined as the ability to influence and control the behaviour of individuals, animals, or objects. Technology is capable of enhancing the strength and reliability of this power (Sarewitz 2009). Technology influences interpersonal relationships, economic structures, and power distribution in society (Müller 2021). Technology as power has implications to empower and disempower individuals or communities and also has ecological implications. Mitcham (2005) states that virtually all sciences and technologies today have implications for ethics and politics, and ethics and politics themselves increasingly influence science and technology— not just through law, regulation, and policy initiatives, but through public discussions stimulated by the media, public interest organizations, and religious concerns. Pattison (2005) explains that technology has already penetrated deeply into our social and psychological sensibilities, making us feel differently about who we are and, therefore, influencing how we act upon our environment and ourselves. Technology has the power to influence or even manipulate society's beliefs be it social; religious, political, economic and ecological. Stahl (1999) attests that technology has a double aspect, they are part of the content of discourse and it is also the mechanism of discourse. Therefore, technology reproduces and reshapes cultural meanings at the same time. Harari (2016) asserts that technology has advanced so much that it could threaten the very existence of humanity and nature.

Technological advancements have received praise and criticism in recent history and ethics of technology (tech ethics or AI ethics) has gained traction as a field of study due to the rising awareness that the rapid adoption of AI and digital technologies can perpetuate existing inequalities and societal impact (De Cremer and Kasparov 2022). Ethics of technology deals with the values and principles of technology and its impact on society. It is important to be aware that technology is not neutral as it is developed by humans with varying backgrounds, ideologies, races, cultures and classes. The

element of bias is therefore prevalent, it defines and may have an impact on the way the technology operates depending on who you are and where you are. The outcome may empower or disempower individuals or communities. Ethics of technology thus informs the laws, policies, and regulations of technology to mitigate the risk of furthering existing inequality, marginalization, and discrimination.

It is not the intention of this study to portray the gloom and doom of emerging technologies as various benefits derive from technology on the one hand, and risks on the other hand. Jasanoff (2016) states that human freedoms vis-à-vis the power of technology, require that the legal and political systems evolve. It is crucial to understand how authority is delegated to technological systems for the delegated power to be controlled and monitored ethically. The role that ethics of technology has to play in society is that the benefits of technology should outweigh the risks. At the centre of discourse is the advocacy of human dignity and ecological preservation in the context of emerging technologies. This study is interdisciplinary broadly of African Theology, African Philosophy, and Technology; more specifically *Ubuntu* ethics and emerging technologies in the African context. This study will commence with an African epistemology of technology through the lens of African Indigenous Knowledge Systems (AIKS) as well as critically discuss the impact of all four Industrial Revolutions on the African continent including the acceleration of digital technologies during COVID-19. The study will then engage on the notion of the human and the future of humanity in the technological age. Transhumanism and posthumanism concepts will be explored; the relation of technology and eschatology from an African perspective will be explored as well as God concerning technology and salvation. The study will then explore the global landscape of AI ethics, the major companies that develop AI and their AI policies including reported incidents surrounding their AI products or services. The implications of the West dominating in terms of AI development and deployment as well as the dominance of a Western epistemology on the global landscape of AI ethics will be explored. The study will conclude by integrating all of the insights and perspectives explored regarding the intricate relationship of power, technology, and development in the African context to explore an alternative *Ubuntu* ethics of technology that is more holistic.

1.2 RESEARCH PROBLEM

Ethics has many theories and methods mainly from Philosophy, Theology, and Religion. There are many debates regarding which ethical theories are more appropriate for particular situations. Each ethical theory has its shortcomings and what works in one ethical dilemma might not necessarily work in another. This study emphasises contextual ethics, ethics grounded in the Philosophy, Theology, or Religion of a particular context. The importance of this is that technology impacts contexts differently. This study argues that, in an African context, it would be appropriate to use an African ethical theory about the ethical implications of emerging technologies. The global landscape of AI ethics is dominated by Western ethics which also embed universalism. It assumes that countries in the world are impacted by emerging technologies in the same way and a one-size-fits-all ethical approach is appropriate. The global landscape of AI ethics also disregards the historical impact of the previous Industrial Revolutions on the African continent vis-à-vis colonisation, imperialism, and apartheid which has contributed to its dispossession, exploitation, and marginalisation. It is important to consider the historical impact of technology in Africa to mitigate the trend of Western hegemony. Emerging technologies are not in isolation from history and need to be addressed from an African ethical perspective. Some of the questions regarding emerging technologies in Africa are whether they will perpetuate coloniality or if AI will be an opportunity for Africa to harness its power for economic growth. There is thus a need to foreground and explore African epistemologies such as *Ubuntu* ethics vis-à-vis the impact of emerging technologies in Africa in general and South Africa specifically to contribute to the ethics of technology body of knowledge.

1.3 LITERATURE REVIEW AND RESEARCH GAP

Advances in technology have heightened public discourse since the mid-twentieth century. Concerns have been raised about nuclear deterrence, environmental contamination, medical consent, data privacy, genetic engineering, intellectual property rights, and nanotechnology (Mitcham and Waelbers 2009).

According to Mitcham and Waelbers (2009: 367), there are three distinct aspects of technology and ethics and it is important to clarify; (a) professional ethics which is a code of ethics for technical professionals such as physicians, engineers, computer scientists, and so forth; (b) general ethics of technology, it derives from the questions that have been raised about the ethical implications of human-artefact interactions, particularly when the artefact is advanced enough to exhibit intellect or emotion. Furthermore, there is an emphasis on expanding ethical concepts beyond human-human interactions to include humans, technology, and the environment; and (c) technology of ethics which is an attempt to turn ethics into technology (Mitcham and Waelbers 2009). The focus of this thesis is on the general ethics of technology which focus on the ethical implications of emerging technologies on society and the environment.

In the article *What is an emerging technology*? Rotolo et al. (2015) explain that the term “emerge” refers to a process of coming to prominence and becoming important. They characterise emerging technologies by five attributes: radical novelty, rapid growth, consistency, significant influence, and unpredictability. In this study, emerging technologies refer to the technologies within the 4IR such as AI. Before recent AI advancements, policymakers in the USA have not had an interest in drafting policies related to technology and its impact on society. For instance, John F. Kennedy was urged to host a conference on robots and labour after his presidential election in 1960 and he turned it down. The establishment of a Federal Automation Commission was later called for and it never happened. According to a search, there had been no hearings on AI until the hearings of advanced robotics by the House Energy and Commerce Committee and hearings specifically focussed on AI by the Senate Joint Economic Committee both held within months of 2016. The Obama White House conducted several seminars on Al and released three official reports outlining its findings that same year (Calo 2017). According to Greene et al. (2019) between 2014 and 2016, "big data" was a strategic goal as well as a subject of moral and ethical concern, according to President Obama and the White House Office of Science and Technology Policy. Although the administration embraced the beneficial impact of big data, it has also reported on the potential harm and discrimination it can produce. It is agreed that from 2016 AI was widely discussed and policy-related documents were drafted by governments, corporations, NGOs, and individuals in society. As of the year

2020, there have been more than 80 different AI policy documents from different countries in the world (Schiff et al. 2020).

The Oxford Handbook of Ethics of AI (2020) edited by Dubber et al. examines the ethical dimensions of AI within legal, regulatory, philosophical, and policy frameworks, considering its interaction with technologies like machine learning and robotics. It advocates for a multidisciplinary perspective, involving social sciences, humanities, and various professions, to address AI's complexities. The book is important in a broad overview of AI ethics but lacks specific ethical approaches such as in African epistemologies and does not cover the sub-Saharan Africa region. *An Introduction to Ethics in Robotics and AI* (2021) by Bartneck et al. offers an overview of the ethical dilemmas posed by AI technology and its applications. It provides background knowledge to understand the implications of AI and explore the risks, rewards, and ethical considerations for businesses, as well as psychological factors that affect privacy. In terms of ethics, outlines the theories behind the ethical review of robots and AI. Three major ethical approaches are discussed: deontology, consequentialism and virtue ethics. It also explains the link between ethics and law, and how these theories can be applied to enable machines to make ethical decisions. Most of the books broadly on ethics and emerging technologies follow Western ethical approaches and focus mainly on the impact of technology in a Western context (Hansson 2017; Peterson 2017; Coeckelbergh 2020; Stahl 2021).

There has been literature on information ethics in the African context which is in the Information Communications Technology (ICT) domain. Britz (2013) defines information ethics is an area of applied ethics that looks at ethical issues related to digital information. It covers topics such as the right to privacy, access to information, intellectual property rights and information quality. It examines the life cycle of information, from its creation to its use. There are two notable books; *African Information Ethics in the Context of the Global Information Society* (Capurro 2007) and *Information Ethics in Africa: Cross-cutting Themes* (Ocholla et al. 2013). These books are important in locating issues of information ethics in an African context as big data is crucial for AI. These books are also necessary as most books on information ethics take their departure from Western philosophy (Capurro 2007). In regards to the 4IR in Africa, the book worth mentioning is *Engaging the Fourth Industrial Revolution: Perspectives from Theology, Philosophy and Education* (2020) edited by Jan-Albert

van den Berg. The book was published in South Africa with the most contributing authors from South Africa. The book is important in understanding the 4IR within the African context generally, and the South African context specifically. The book engages with technology from varying theological and philosophical perspectives but mostly relies on Western epistemologies. Another critique of the book is the lack of representation of black Africans and women. The book *The Fourth Industrial Revolution and the Recolonisation of Africa: The Coloniality of Data* (2021) by Everisto Benyera deliberates on emerging technologies within the context of coloniality and asserts that these technologies are a continuation of the exploitation of Africa by the West through tech companies.

There is a growing literature that AI can contribute to the recolonisation of Africa which warrants calls for decolonising AI or decolonial AI (Onwughalu and Ojakorotu 2020; Zembylas 2023; Mhlambi and Tiribelli 2023). Adams (2021) in the article *Can artificial intelligence be decolonized?* explains that decolonial thought challenges the racial and colonial biases in AI, aiming to dismantle the power dynamics and exclusionary practices that prioritize Western reason, while advocating for alternative ways of knowing, living, and resisting. The article is useful in how the theory of decolonisation links with AI but it does not offer a clear path on how to decolonize AI.

The most recent and relevant resources on AI and ethics in Africa are the books *Responsible AI in Africa: Challenges and Opportunities* edited by Damian Eke, Kutoma Wakunuma, and Simisola Akintoye (2023) and *AI in and for Africa: A Humanistic Perspective* written by Susan Brokensha, Eduan Kotzé, and Burgert Senekal (2023). *The Responsible AI in Africa: Challenges and Opportunities* is the first of its kind book that argues for the inclusion of African narratives in the global AI ethics discourse. It posits that African moral traditions should be considered in decisions regarding AI applications, especially those deployed in the continent, to achieve fair, just and transparent AI. Without these considerations, AI applications may not benefit African societies or promote human flourishing. This book provides a platform for the discussion of culturally sensitive and inclusive AI systems that can improve African societal situations (Eke et al. 2023). The limitation of the book is that *Ubuntu* is merely used as an example for AI in Africa as opposed to Western philosophy but does not fully elaborate the tenets encompassing *Ubuntu*. The *AI in and for Africa: A Humanistic Perspective* book provides a comprehensive overview of AI's current deployment in

Africa, emphasizing the need for ethical policies tailored to the continent. The book advocates for a tailored approach to implementing AI in Africa, as opposed to a single, uniform solution. It suggests that, due to Africa's diversity, its AI ecosystems should be varied. This would help to ensure that the continent's AI use is equitable and beneficial for all. The book does not rely solely on *Ubuntu* but approaches AI from both Western humanism and African humanism. The current literature on AI ethics in Africa particularly *Ubuntu* and AI lack the holistic nature of *Ubuntu* which is rooted in the interconnectedness of humanity, spirituality, and ecology.

This study makes use of decoloniality as a theoretical framework. According to Ndlovu-Gatsheni (2020), decolonization and decoloniality can be thought of as both a political and an epistemological movement, which may lead to a greater understanding of various forms of knowledge and different ways of life. Decolonization and decoloniality are thus used interchangeably. As a political movement, it has a longstanding history of marginalized groups opposing the slave trade, imperialism, colonialism, apartheid, neo-colonialism, and underdevelopment, all of which are part of the Euro-North American-centric modernity. As an epistemological movement, it has been marginalized by dominant intellectual and social theories that stem from Europe and North America (Ndlovu-Gatsheni 2015). This study makes use of decoloniality as an epistemological movement which seeks to critique Western epistemologies and allow alternative perspectives to be seen and explored. Decoloniality is a dynamic concept and a way of making visible, understanding and advancing alternative epistemologies, especially from the global south (Walsh 2018).

1.4 OBJECTIVES

The objectives are as follows:

1. Defining Technology from an African epistemological perspective and engaging the Fourth Industrial Revolution and its ethical implications in the South African context with a special focus on COVID-19.
2. Understanding what it means to be human in the technological age. Another aspect is the engagement of African Theology and posthumanism.
3. Engaging the global landscape of AI ethics, prominent companies developing and deploying AI technologies and their policies.

4. How *Ubuntu* can contribute to the Ethics of Technology in an African context in a holistic way.

1.5 RESEARCH METHODOLOGY

This study primarily relies on a critical literature review approach. According to Stratton (2019: 348), “Critical reviews do not include the rigorous study design of a systematic review and are a form of narrative review. The objective of a critical review is to develop perspectives on a research topic using available literature.” Literature in this study does not only mean books and articles but also includes policy documents and various media formats such as online videos. A critical review's search approach seeks to identify the most relevant material in past contributions to the study (Grant and Booth, 2009). For relevant literature in this study, a broad search was undertaken via Google Scholar, ScienceDirect, EBSCOHost, Sabinet, ProQuest, and African Journals Online (AJOL), among others. The following are some of the keyword(s) that were inputted to find relevant literature: “*Ubuntu* philosophy,” “*Ubuntu* and technology,” “African ethics and technology,” “*Ubuntu* and Fourth Industrial Revolution,” “AI ethics,” “4IR,” “AI regulation,” “Fourth Industrial Revolution,” “AI,” “responsible AI,” “*Ubuntu* and AI,” “emerging technologies,” “global landscape of AI ethics.” To contextualise the search the following terms were included: “Africa,” “Sub-Saharan Africa,” and “South Africa.” The selected literature from the search was based on relevance to the topic of this study *Ubuntu* ethics and technology especially Africa in general and South Africa specifically. The critical review approach may be limited by the omission of relevant literature because it does not use a systematic search approach and interpretation may be subjective (Grant and Booth 2009; Stratton 2019).

The literature that will be analysed in this study will be on the development and deployment of technology in Africa as well as the impact and implications from an ethical perspective. Technology in this study is referred to as consisting of three elements, namely, tools (i.e., the machines, chemicals, instruments), processes (i.e., techniques and methods) and social contexts (i.e., the very different contexts in which it is used and developed) (Veldsman 2019). The study will be based on the emergent technologies within the 4IR. Literature such as Schwab (2016), Schwab and Davis (2018), Harari (2018), Johnson and Markey-Towler (2020) and Doorsamy, Paul and

Marwala (2020) will help us to understand the 4IR from a global perspective. Literature such as Van den Berg (2020), Marwala (2020a), Marwala (2021a), Aigbavboa and Thwala (2019) and Sutherland (2020) amongst others will assist in understanding the 4IR in the African context in general and South Africa specifically with regards to ethical implications.

The point of departure for *Ubuntu/Botho* is humanness. Dolamo (2013: 2) states that to some *Ubuntu/Botho* means 'humanity', while to others it means 'humanness'. Explaining *Ubuntu/Botho* as humanity may be rather misleading and confusing, since humanity may simply refer to humankind. Humanness seems to be more appropriate as it refers to the inner core of an individual. Vellem (2010: 316) explains that *Ubuntu/Botho* correlates to the statement *motho ke motho ka batho*, meaning "I am because we are." Indeed, considering dignity to be intricately linked to relationships, makes it plausible to render the African dictum, "I am because we are" as a statement of dignity. This notion of *Ubuntu/Botho* takes into consideration the welfare of human life and implicitly against forms of dehumanisation, oppression and marginalisation. There are various Theological, Philosophical and Educational perspectives when it comes to *Ubuntu* (Gade 2011). Most definitions of *Ubuntu* about emerging technologies such as AI are anthropocentric (Mhlambi 2020; Adams 2021; Dignum 2023; Brokenhsa et al. 2023) and emphasise community (relationality) over individuality. Although the emphasis on community (human-human) in *Ubuntu* is true, however, it is a limiting definition as technology also impacts spirituality and ecology. Therefore, this study approaches *Ubuntu* holistically to include humanity, spirituality, and the environment (Ramose 2005; Masango 2006; LenkaBula 2008; Museka and Madondo 2012; Chigangaidze, 2022). The technological developments in the 4IR pose a question of what it means to be a human. Literature from Wolfe (2010), Braidotti (2013), Harari (2016) and Ferrando (2019) will be critically discussed on Posthumanism and Pattison (2005), Waters (2006, 2016), Indick (2015), Thweatt-Bates (2016) will be used in the engagement of Theology and Posthumanism.

The contribution that this study will make is a holistic *Ubuntu* Ethics approach which includes humanity, spirituality, and the environment concerning emerging technologies such as AI in the African context generally and South Africa specifically in the broader field of ethics of technology.

1.6 LIMITATIONS

This study will be rooted in African epistemologies in the field of African Theology and African philosophy in relation to *Ubuntu*. The author is African, Christian and male from South Africa. The thesis will focus on the South African context unless stated otherwise. Emerging technologies such as AI are constantly developing and research in AI and AI ethics is published regularly which makes it difficult to keep up. The limitation of this is that the most recent literature or news may be unintentionally omitted but the study does cover the important aspects. Another limitation is that there is a lot of information on emerging technologies in the 4IR but the study limits it to AI and AI ethics.

1.7 CHAPTER OUTLINE

Chapter 1 – Introduction

This chapter introduces the topic of study; the research problem, the literature review and research gap, the objective of the study, the research methodology, limitations and the chapter outline. This study is divided into 6 chapters.

Chapter 2 – African epistemology of technology and the 4IR

This chapter will mainly engage the ethical implications of the Fourth Industrial Revolution broadly on the African continent and specifically on the South African context. Before that, technology will be discussed from an African epistemological perspective through ancient African technology. This chapter will also engage the impact of the previous Industrial Revolutions on the African continent. It will also discuss the technological developments and the impact of technology in Africa in the context of COVID-19. The most important literature in current conversations on 4IR in the African context will be critically discussed.

Chapter 3 – Being *umuntu* (human) in a technological age

This chapter will engage on what it means to be a human being in a technological age and its relation to God. This chapter will engage on the concept of posthumanism through an African Theological perspective.

Chapter 4 – Global landscape of AI ethics

This chapter will critically discuss AI ethics development in the world particularly the public sector, private sector, and NGOs. Companies developing AI products and services as well as responsible AI principles will also be discussed.

Chapter 5 – *Ubuntu* Ethics of Technology

In this chapter, we will conduct a critical analysis of how *Ubuntu*, the African philosophy of interconnectedness and human dignity, can offer valuable contributions to the field of AI Ethics within the African context. This chapter proposes a holistic Ubuntu AI ethics which includes humanity, spirituality, and the environment.

Chapter 6 - Conclusion

This chapter integrates and concludes the study and provides recommendations for further studies.

CHAPTER 2

AFRICAN EPISTEMOLOGY OF TECHNOLOGY AND THE 4IR

2.1 INTRODUCTION

The main purpose of this chapter is to engage on the ethical implications of the Fourth Industrial Revolution broadly on the African continent and specifically in the South African context. Although there are also conversations about the Fifth Industrial Revolution (5IR), this thesis will focus on the 4IR and the reasons will be deliberated later in the chapter. Before that, technology will be discussed briefly from an African epistemological perspective through ancient African technologies. This is important to discuss as it is mostly assumed that technology is Western but as the previous chapter alluded, technology is a human trait. This will be unpacked from the African context. It is also important to discuss the impact of the three previous Industrial Revolutions which propelled and perpetuated the slave trade and colonialism thereby deepening socio-economic inequalities, marginalization and oppression in Africa. Will the 4IR continue from the previous revolutions or how will it be different? The recent impact in the world has been the COVID-19 pandemic which has further displayed the socio-economic and technological inequalities in African societies as citizens were expected to work and learn from home during lockdown. In the meanwhile, aspects of the Fourth Industrial Revolution are being implemented in many parts of the world. There is also a global race to harness the power of the 4IR and Africa does not want to be left behind. There are voices in Africa that are sceptical, and others are optimistic about the 4IR, this chapter will critically discuss the most important literature in current conversations on the 4IR in the African context.

2.2 AFRICAN EPISTEMOLOGY OF TECHNOLOGY: ANCIENT AFRICAN TECHNOLOGIES

In the previous chapter, it has been alluded to that technology has been part of human existence since time immemorial. If we are to trace technology in human origins, there are within cultural anthropology broad indications of technological developments within the story of *Homo sapiens*. The dawn of technology according to Smithsonian Institution (2022) was that early humans in East Africa began using hammerstones to pound stone cores and create sharp flakes around 2.6 million years ago. Early humans

employed these techniques for accessing new resources, including flesh from huge animals, for more than two million years. Controlling fire gave a new tool with a variety of purposes around 800,000 years ago, including cooking, which resulted in a significant shift in the early human diet (Smithsonian Institution 2022). Humans finally discovered they could regulate the growth and reproduction of specific plants and animals 12,000 years ago. This finding paved the way for farming and animal herding, two occupations that changed Earth's natural landscape, first locally and later internationally (Smithsonian Institution 2022).

Whenever we speak of technology, we immediately think of computers, the internet, and other gadgets without realising that technology is not limited to ICT or digital technologies; it is more than that. To understand the African epistemology(ies) on technology, we must investigate the African past on what was considered science and technology. Shizha (2016:47) states that Africa's development of science and technology is often judged from the perspective of the former colonisers. The notion that Africa was considered a dark continent and Africans were a backward people, perpetuated a stereotype that Africans were incapable of reasoning, had no scientific knowledge, ability and could not develop indigenous technologies to solve the problems of their times (Zegeye and Vambe 2006:331). It is thus imperative to understand African societies from pre-colonial times in how they navigated life by developing their indigenous technologies. There is a growing scholarship of African Indigenous Knowledge Systems (AIKS or IKS). According to Conradie and Du Doit (2015:458), the importance placed on IKS in South Africa is a component of a larger effort to rediscover African identity. The development of IKS is being supported by a lot of resources. One of the few publications recently launched to promote IKS is *Indilinga* (African Journal of Indigenous Knowledge Systems).

Ezeanya-Esiobu (2019:7) asserts that historically, indigenous knowledge systems have been labelled as "primitive," "backwards," "savage," "rural," "unscientific," and other condescending terms. This is often the case when it comes to non-Western knowledge systems as they are not "universal" as Western science. Indigenous knowledge systems, however, are specific to a culture. Dei et al. (2000:6) define indigenous knowledge as a corpus or knowledge in a locality related to traditional standards and societal values that guide, organize, and govern people's ways of living and making sense of their reality. One aspect of AIKS or ancient African technologies

worth mentioning was that it was community-based and served a particular need which in turn was sustainable for the environment (Eyong 2007; Nelson 2015).

Shizha (2016:47) further argues that African societies from pre-colonial times were not homogenous and makes an example that the Ethiopian empire cannot be compared to the hunting groups of the Mbuti people in Congo or Western Sudan empires cannot be compared to the Khoi and San hunter-gatherers of the Kalahari Desert. These examples point out that each African society had its context, beliefs, and way of life. There is also a phenomenon where high technology was concentrated at a particular geographical centre, trade post, intelligentsia or royal capital vis-à-vis the absence or slow infiltration of high technology in the periphery (rural or desert areas) which was similar around the world, at least before the First Industrial Revolution (Van Sertima 1983:8).

It is widely known that ancient Egypt was an advanced African society that marvels scientists even today on how ancient Egyptians could develop high-end technologies in ancient times but not much attention has been given to sub-Saharan African societies which also had the scientific spirit through mathematics; arithmetic, metrology, geometry, astronomy, and natural sciences (Helene 2017:47). Austen and Headrick (1983:165) attest that those technological developments in Africa are based on findings or writings from Africanists from different disciplines such as historians; archaeologists, anthropologists, and development economists. In this section, we will briefly discuss a few African indigenous sciences and technologies such as astronomy, mathematics, writing systems, and metallurgy; and also discuss two Southern African civilizations namely Mapungubwe and Great Zimbabwe.

2.2.1 African Indigenous Astronomy

Ancient African societies such as the Dogon of Mali and the archaeostronomical site named Nomaratunga in Kenya for example were known for their astronomical knowledge (Van Sertima 1983: 10-14). According to Holbrook (2007:24), the interest in African indigenous astronomy can be traced back to the works of Marcel Griaule among the Dogon of Mali published in 1948 as *Dieu d'Eau: entretiens avec Ogotemmêli* and subsequently translated into English in 1965 entitled *Conversations with Ogotemmêli: an introduction to Dogon religious ideas*. Germaine Dieterlen,

Griaule's student, and Youssouf Cissae, a young Malian anthropologist, undertook two significant studies among the Bamana of Mali in the 1970s. They investigated the writing system of the Komo secret organization, one of the Bamana's six power groups. They discovered that the Milky Way is represented by all of the symbols put together and that individual symbols include several that are related to stars, the sky, and weather. Dominique Zahan, the second scholar who researched the Bamana, focused on the Ciwara agricultural civilization of the Bamana. The Ciwara society is far less clandestine than the Komo group and is open to anyone. The Ciwara society incorporates their knowledge of the skies into their agricultural practices, which include weather forecasting, determining tilling and harvesting dates, and performing symbolic ceremonial tilling and harvest dances. The study of the Mursi calendar by anthropologist David Turton and archaeoastronomer Clive Ruggles is another noteworthy article. They looked into the social aspect of timekeeping to maintain their calendar accurately.

Namoratunga II in Kenya is the first archaeoastronomical site in the Sub-Sahara studied for its astronomical alignments (Lynch and Robbins 1978; Holbrook 2007). Two sites have the same name “Namoratunga” meaning “the stone people” in Turkana language. Namoratunga I is a site with at least one grave marked with upright slabs and other upright slabs were engraved with the same rock art dated approximately 300 B.C. Namoratunga II on the other hand is located 210km from Namoratunga I and they are both related. The difference is that Namoratunga II has 19 large stone columns that are aligned unusually and placed at different angles. These stones were investigated concerning the current Eastern Cushites' calendar, which calculates a 12-month, 354-day year by using the rising of the seven stars or constellations (Triangulum, Pleiades, Aldebaran, Bellatrix, Central Orion, Saiph [Kappa Orionis], and Sirius [7]) in conjunction with the phases of the moon. It was taken into consideration upon investigation that the world was different in approximately 300 B.C. with the gradual change in its axes of rotation to make precise calculations. The archaeoastronomical information in Namoratunga II contributes to the expanding body of knowledge of the complexities of a devised astronomical calendar in pre-historic Sub-Saharan Africa.

The North-West University in South Africa conferred the first Ph.D. in African indigenous astronomy to Motheo Koitsiwe in 2019. His research was on the Batswana

indigenous knowledge systems' usage of astronomy or *Bolepa-dinaledi* in Setswana, for various reasons such as measuring time, menstrual cycles, seasons, navigation, and rainmaking among others (North-West University 2019). African societies knew and studied astronomy using indigenous knowledge systems to determine various outcomes. Koitsiwe (2019:222) argues that astronomical indigenous knowledge among the Batswana people made use of oral tradition; stories, songs, poems, and riddles to pass down astronomical knowledge from generation to generation.

2.2.2 African Indigenous Mathematics

Concepts of mathematics have been established in pre-colonial Sub-Saharan Africa. Classical Greek mathematics had its roots in Egypt and Mesopotamia (Huylebrouck (1996:56). Nleya and Ndlovu (2020:125) make use of an "ethnomathematical" approach that emphasizes the value of African local culture in mathematics. Huylebrouck (2006:136) explains that African ethnomathematics is collected in four ways: (1) written sources in Egyptian temples, (classical) Greek texts and some scarce reports on American slaves, (2) oral chronicles, (3) recent observations of traditional customs, and (4) the archaeological findings. The notion that mathematics is not a culture-free discipline inspired the ethnomathematics approach. Mathematical notions may be found in artefacts and other technical items from many civilizations. Geometry, graphing, counting, and record keeping are examples of mathematical ideas demonstrated through traditional African games (Nleya and Ndlovu 2020:125). Two mathematical tools will be briefly discussed namely, the Ishango bone found in the Congo and the Lebombo bone found in Swaziland. The Ishango bone is dated 22,000 years old and was discovered by archaeologist Jean de Heinzelin in the 1950s. It is the earliest artefact to suggest knowledge of a number system (de Heinzelin 1962; Pletser and Huylebrouck 2016; Nleya and Ndlovu 2020). The Lebombo bone on the other hand, a little fragment of a baboon's fibula (dated around 35000 BC) was discovered marked with 29 well-defined notches during excavations near what is now known as Border Cave in the Lebombo Mountains between South Africa and Swaziland in the 1970s. The bone, which resembles the calendar sticks currently used by the San people in Namibia, is more than 37,000 years old, making it one of the world's oldest mathematical items. It has also been argued that because the Lebombo Bone was used as a moon phase counter, women may have been the first

mathematicians, given that menstrual cycles necessitate the use of a lunar calendar (Setati and Bangura 2011:11).

2.2.3 African Writing Systems

Writing is a form of storing information and communication, and there are many ways of storing information in African societies essential for their survival such as rock art (San people); scarification (creating scars for body art), mnemonic devices (tally sticks like the Ishango bone and knotted strings like the Aroko of the Yoruba), and symbol writing (Akan gold weights, Adinkra symbols, Ndebele symbols), the Tifinagh alphabet of the Tuareg, are forms of African writing systems that should not be perceived as merely decorative art that has been used pre-history (Mafundikwa 2004:11). These African writing systems were functional for communication and storing of information that qualify as the prototype of writing in varying African societies. Writing, however, has been used as more than information storing but also as a measurement of civilization by the West (Asante 2019:259). Mafundikwa (2004:9) argues that there are no “primitive” forms of storing information or writing but only a society’s level of development at a particular epoch and when that form of storing information or writing system serves its intended purpose, it is therefore appropriate for that society. Asante (2019:260-261) lists several African scripts such as the Vai, Mende, Loma, Kpelle, Bassa, Gola, Mandinka, Bamana, Wolof, Gerze, Fula, Bete, Nsibidi, Guro, Bamun, Bagam, Ibibio-Efik, Yoruba, and the Djuka syllabary brought by Africans to Surinam in South America, Ge’ez script, Tifinagh (for the Amazigh languages), Adlam for Fulfulde, etc. There is also a variation of Nsibidi found in Cuba (Anaforuana) and Haiti (Veve). These African scripts highlight how African societies developed various ways of communication and storing information to advance their societies.

2.2.4 Indigenous African Metallurgy

According to Childs and Killick (1993:317) for almost three centuries, Western observers have commented on mining and metallurgy technologies in Sub-Saharan Africa, but Western knowledge of the cultural components of African metallurgy is far more recent. It was not until the British expedition of 1897 looted Benin City that the outside world learnt of the West African traditions of figurative metalwork, and it was

not until the late 1940s that archaeologists began to explore these traditions. Even more recent are anthropological studies of the cognitive and symbolic components of metallurgy in preindustrial African communities. Even though missionaries and colonial officials had brought attention to the rituals involved with smelting metals in Africa in the early 1900s, major anthropological investigations of the conceptual and social components of these technologies did not begin until the late 1940s. Chirikure (2015:17) states that Egyptian metallurgy began processing copper around 4000 BC. The Bronze Age was well established by 3000 BC, with iron arriving much later in the previous millennium BC. Iron smelting arrived significantly later in Egypt (c. 600 BC) and even later (c. 500 BC) in regions like Meroe in Sudan. In contrast to this picture, metallurgy in Sub-Saharan Africa began with the processing of iron and, in some cases, iron and copper. In West Africa, Central Africa, East Africa, and Southern Africa, this is especially true. The introduction of metallurgy to Sub-Saharan Africa is a sensitive topic because there are two or more contradictions for every possibility. In the radiocarbon black hole generated by changes in atmospheric radiocarbon concentration, metallurgy originated in West, East, and Central Africa between 800 and 400 BC. Metallurgy originally arose in Southern Africa with the arrival of agriculturalists early in the first millennium AD (Chikure 2015:17-18). The origins of metallurgy in Sub-Saharan Africa have sparked debate and mostly unresolved discussions about whether it is an independent innovation or influence from an external source (Alpern 2005:94). In Southern Africa, there are sites known for metallurgy in pre-colonialism such as Great Zimbabwe, Mapungubwe, Rooiberg, Phalabourwa, Enkwazini, and Namaqualand amongst others (Miller and Van Der Merwe 1994:2). The article *An Historical Account of Iron Smelting in the Lowveld, South Africa* (2002) by Miller, Mulaudzi, and Killick recounts the writings of a missionary's wife Mrs E.D Giesekke in the 1930s which narrates the indigenous process of charcoal production, iron mining, smelting, and smithing in Phalabourwa even though the area was known for metallurgy before. Her contribution is the only known detailed description of the smelting process and rituals associated with it in the Lowveld. The unfortunate thing is the living memory of the indigenous processes of metalwork is swiftly fading with the passing of the last practitioners and there have been efforts to record these practices on film and print to preserve the knowledge as listed in David Killick's article *Recent films and publications on African metallurgy* (1988:39-41).

There is an interesting YouTube video “Smelting Iron in Africa (a demonstration)” https://www.youtube.com/watch?v=RuCnZClWwpQ&list=LL&index=4) that demonstrates the process of indigenous metallurgy in a rural community in Burkina Faso. This was recorded to preserve (archive) the indigenous knowledge of metallurgy in that community (Roy 2014). What is interesting in the demonstration was the spiritual aspect in which a chicken was slaughtered to give thanks to the Supreme Being and ask for the metallurgical processes to be successful.

2.2.5 Mapungubwe and Great Zimbabwe

According to Huffman (2009:37) Mapungubwe and Great Zimbabwe are of global significance because they reflect the growth of Southern African indigenous states’ pre-history. These Southern African ancient civilizations had international trading of gold and ivory that further advanced their growing social complexities. This higher complexity emerged first at Mapungubwe, and its archaeological manifestation was later refined at Great Zimbabwe. The Shashe River joins the Limpopo River around the point where the borders of South Africa, Botswana, and Zimbabwe meet. The Greefswald farm is located nearby on the right bank (on South African territory). The area is under the custodianship of the Republic of South Africa, and Mapungubwe’s "cultural landscape" has been placed on the UNESCO World Heritage List (Fauvelle 2018:136). Before Europeans became aware of Mapungubwe in the 1930s, the natives in the area had already known about the hill and they called the hill Mapungubwe. Setumu (2012:3) states that Maphungubwe translates to "a place of (many) jackals." It is worth noting that the Bantu root "-pungubwe" refers to "jackal" and is practically identical in several Bantu languages. This dog-like wild animal is known as *phunguwe* in Venda and *phukubje* in Northern Sotho. Mapungubwe had always been taboo and considered a terrifying place. They would not even point at it, and when it was brought up, they kept their backs carefully turned towards it. They believed that climbing it would almost certainly result in death. It was revered as a sacred area of the Great Ones, who had buried hidden treasures there among their forefathers (Fouche 1937:1). It is estimated that Mapungubwe was inhabited for about 80 years from 1220 to 1290 AD with an inhabitant of about 5000 people (Huffman 2009:44). The significance of Mapungubwe is that natives had indigenous processes of mining, smelting and creating artefacts with gold, such as the famous gold rhino, a

sceptre, a bowl and bangles (Setumu 2012:6). Other artefacts that were found at Mapungubwe were pottery. There were disputes about the inhabitants of Mapungubwe, with some historians claiming that they could not have been Bantu but were “Boskop-Bush,” “pre-Bantu” or “proto-Hottentot” (Galloway 1937:149; Gardner 1955:74). These disputes, however, were resolved that indeed, the inhabitants on Mapungubwe were Bantu (Huffman, 1996:55; Huffman 2009:42). Ultimately, the inhabitants of Mapungubwe were African. The demise of Mapungubwe was due to a little ice age which made it colder and drier in the interior making it difficult to inhabit and cultivate, it was therefore abandoned around 1300 AD, which gave rise to Great Zimbabwe (Huffman 1996:57; Setumu 2012:7).

Great Zimbabwe (AD 1290 to 1450) became the successor of Mapungubwe as a cultural, political, and economic hub after the demise of Mapungubwe (Huffman 2000:14; Hall and Stefoff 2006:35; Pikirayi, 2013:26). The name Zimbabwe or Dzimbabwe is a Shona name meaning “houses of stone” (Fauvelle 2018:217). Asante and Asante (1983:84) state that Great Zimbabwe was a great African city-state and one of the massive stone complexes in Africa. When Europeans saw Great Zimbabwe, they refused to believe that it was an architecture built by Africans and attributed it to the Queen of Sheba, King Solomon, or the Phoenicians (Hall 1905:296). David Randall-MacIver and Gertrude Caton-Thompson, however, confirmed the African origins of Great Zimbabwe in 1905 and 1931 respectively, although, Caton Thompson did not see any greatness in the architecture of Great Zimbabwe (Hall and Stefoff 2006:8; Ndoro 2001:40). The significance of Great Zimbabwe is that it was an important commercial centre in Southern Africa based on military prowess and the accumulation of wealth in cattle and trading with the Arab-Swahili in the east coast of Africa (Ndoro 2001:22).

Pre-colonial Africa thus had communities that had their forms of science and technologies which were not homogenous. The following section will discuss the three previous Industrial Revolutions and their impact on Africans and the African continent.

2.3 IMPACT OF THE THREE PREVIOUS INDUSTRIAL REVOLUTIONS IN AFRICA

Before we discuss the ethical implications of the 4IR, it is important to look back at the impact of the previous three Industrial Revolutions on Africans and the African continent. It is also imperative to understand what constitutes an “Industrial Revolution”. According to More (2000:1), some scholars have understood the word "revolution" as a term for major socio-economic structural reform. The term "revolution" is thus used to make sense of or explain these significant changes over some time. The Industrial Revolution, in this perspective, was only a continuation of prior development; it was not distinct, but only in degree. As a result, the factors were not relatively unknown, but rather, were anchored in the past, and the historical research of the Industrial Revolution is to track the progression and precise nature of the changes. Others, on the other hand, saw the “revolution” as a total transformation in the economic growth process, and this is what was referred to as revolutionary. French writers used the term “Industrial Revolution” before it was popularized by English economic historian Arnold Toynbee to describe the economic development of Britain from 1760-1840 (Britannica 2022). Moll (2021:7) notes the insights of Karl Polanyi’s article *Universal Capitalism or Regional Planning?* (1945) that before the Industrial Revolution, people's socio-economic outlooks were founded on community systems of reciprocity and redistribution. Therefore, the result of industrialisation was the structural establishment of a market-competitive society governed by the state. Moll further explains that even though some economists regard a phase of short-term economic growth to be a revolution, many historians believe that an epoch of change must be marked by long-term socio-economic transformation at a fundamental, or structural, level to be deemed a revolution. Industrial Revolutions are widely seen by historians, unlike economics, as complex combinations of technological, economic, social, political, and cultural change that unfold worldwide across time (Moll 2021). Deane (1979:1) attests that an Industrial Revolution is a change in the methods and characteristics of economic organization which, taken together, constitute a development of the kind which we would describe as an Industrial Revolution. This does not mean that there is one such thing for all countries; rather, it means that there are identifiable changes in the way that economic organization is organized. According to Deane (1979:1), seven interrelated changes can constitute an Industrial Revolution:

1. widespread and systematic application of modern science and empirical knowledge to the process of production for the market.
2. specialization of economic activity directed towards production for national and international markets rather than for family or parochial use.
3. movement of population from rural to urban communities.
4. enlargement and depersonalization of the typical unit of production so that it comes to be based less on the family or the tribe and more on the corporate or public enterprise.
5. movement of labour from activities concerned with the production of primary products to the production of manufactured goods and services.
6. intensive and extensive use of capital resources as a substitute for and complement to human effort.
7. emergence of new social and occupational classes determined by ownership of or relationship to the means of production other than land, namely capital.

These seven changes have always been linked to increased population and yearly output of goods and services. Moll (2021:8) provides an updated and concise characteristic of what the Industrial Revolution entails:

- A technological revolution characterised by widespread, connected innovation.
- Transformation of the labour process or the 'nature of work'.
- Changing labour relations in the workplace and their social ramifications.
- Fundamental changes in everyday social life (notably in cities); and
- Global transformation related to international trade and agglomerations of power.

At the centre of what constitutes the Industrial Revolution is the socio-economic factor in its complexities. The following section will discuss the three previous Industrial Revolutions and their impact on Africans and the African continent.

2.3.1 The First Industrial Revolution: 1760-1850

More (2000:2) states that it is difficult to pinpoint when the start of the Industrial Revolution was. Scholars would rather make use of decadal turning points than individual years for dating purposes but mainly for convenience. It has been said before that the Industrial Revolution did not just simply appear out of nowhere but was a gradual process in history. That is the reason a few historians would go back much farther than 1750 to date the First Industrial Revolution (1IR), but some do so to

connect it to the causative variables back in history. 1760 is a much-preferred date by many historians because of the significant number of innovations that occurred shortly after. 1780 is also a popular starting point. Some argue that the full influence of the First Industrial Revolution was realised in the 19th century. According to Moll (2021:2) in the minds of many people, two opposing 1IR tales prevail. The first relates the triumphant tale of Britain's ascent to wealth and worldwide domination, which was made possible by a sudden boom of technological innovation. The 1IR therefore, began predominantly in Britain. The second storyline focuses on the deterioration of the working class, as well as the deplorable working and living circumstances connected with the expansion of massive industries and densely populated cities. Although both stories are oversimplified, they represent the emergence of the factory and the contradiction between substantially enhanced economic productivity and massively damaged social institutions that defined the 1IR (Moll 2021:2). The emergence of factories disrupted rural life and more people migrated to the cities for work opportunities. The 1IR was thus a shift or transition from an agricultural and handicraft economy to one dominated by industry and machine production (Britannica 2022). According to Fourie (2020:11), the 1IR is known as the “steam era” which ushered in mechanisation based on the power of water and steam. This resulted in a significant increase in output and productivity, as well as implicitly contributing to urbanisation (with the factory serving as the focal point of community life), railroads, the steamship, the rise in poverty, and the emergence of a middle class.

Inkori (2002:156) states that in the 1IR, the first example of a trade-led economic development was in England, and the sources of trade expansion, or the "Commercial Revolution," that drove the process to prosperity in the 17th and 18th centuries were in the Atlantic world. The Atlantic world comprises the following geographical areas (Inkori 2002:157):

- Western Europe (Italy, Spain, Portugal, France, Switzerland, Austria, Germany, the Netherlands, Belgium, Britain, and Ireland).
- Western Africa (from Mauritania in the northwest to Namibia in the southwest, comprising the two modern regions of West Africa and West-Central Africa), and
- the Americas (comprising all the countries of modern Latin America and the Caribbean, the United States of America, and Canada).

Williams (1944:51) refers to this as the “triangular trade” in which exports and ships were equally provided by England, France, and America; Africans were abducted in Africa for enslavement in America and raw material came from plantations. This triangular trade provided Britain with a “triple stimulus” that worked in this way:

> African people were captured and sold onto ships and transported across the Atlantic to become slaves on plantations in the Americas. The cotton that they produced was transported across the Atlantic to the burgeoning textile factories in the north of England. Much of the cloth produced in these factories was then transported down the Atlantic coastline, as the most desired currency used by British traders to buy slaves in Africa. (Moll 2020)

The 1IR in Britain was thus propelled by the dehumanization and oppression of Africans reduced to commodities than human beings. Williams (1944:51) quotes William Wood who wrote in 1718 that the slave trade was “the spring and parent whence the others flow.” Shortly after that, in 1720, Postlethwayt wrote that the slave trade was “the first principle of the rest, the mainspring of the machine which sets every wheel in motion.”

Stearns (2013:93) mentions other non-Western places that attempted early imitations of industrialization such as in the Middle East and India which mainly failed - though not without causing significant economic upheaval. Latin America has also pioneered several technical advancements that were revealingly restricted. Only Eastern Asia and Sub-Saharan Africa were generally spared from explicit industrial imitations until the late 1860s or later; they were too far removed from European culture to adapt swiftly.

2.3.2 The Second Industrial Revolution: 1865-1914

According to Mokyr and Strotz (1998:14), in many respects, the Second Industrial Revolution was a continuation of the first. There was direct continuity in many industries. However, it varied from it in several key ways. First, it had a significant impact on actual incomes and living conditions, which were different in 1914 than they were in 1870. Second, it changed the geographical emphasis of technological leadership away from Britain and toward a more scattered centre, albeit the monopoly of the industrialized Western world remained intact. Moll (2021:9) attests that the global expansion in the 2IR was no longer centred on the industrial economy of a

single dominant country, as it had been in the 1IR. Germany, France, Belgium, Italy, the United Kingdom, the United States, Denmark, the Swedish-Norwegian Union, and Japan formed a worldwide economic nexus (global industrial nexus) by the 1880s. Modern industry began to harness numerous previously untapped natural and synthetic resources, including lighter metals, rare earth, new alloys, and synthetic goods like plastics, as well as new energy sources. The automatic factory was born as a result of these breakthroughs in machines, tools, and computers (Britannica 2022). According to Moll (2021:12), the 'scramble for Africa' exposed the imperialist character of the industrialized nations' economies startlingly. 80% of Africa was still under traditional and local sovereignty in the 1880s. However, the global industrial nexus became more intrigued by Africa's natural resources and future markets and, therefore, convened the Berlin Conference in 1884-1885 to avoid potential conflicts amongst themselves in the African continent. They drafted a document that was disproportionately focused on preserving free trade in Africa for themselves. The colonial powers immediately divided almost all of Africa among themselves after signing the treaty without the consent or participation of Africans.

Unlike the fundamental breakthroughs of the 1IR, which tended to be connected within the walls of factories, the new technologies of the 2IR revolutionized daily life in industrialized nations. Although electricity was not discovered in the 2IR, it was one of its most important achievements, opening the door for electric machinery in manufacturing and lighting in workplaces, streets, and homes. Following the invention of open-hearth furnaces in Germany in 1865, which enabled large-scale steel manufacturing, low-cost, high-quality steel became widely available. With the creation of the automobile, petrol was found. Internal combustion engines, diesel engines, telephones, light bulbs, skyscrapers, aeroplanes, plastic, and the first transatlantic radio transmission were all invented by German, British, American, and Italian innovators (Moll 2021:9).

The 1IR was the enslavement of Africans and the 2IR was the reinforcement of colonization in Africa by European countries despite the abolition of slavery. The 2IR is also known as the “age of imperialism” (Moll 2020). Benyera (2021:126) attests that the colonialization of land in Africa was the focus of the 2IR. During this time, the exploitation and hoarding of African natural resources became more intense. The amassing of Africa's debt by Western financial institutions occurred along with the

Industrial Revolution. The concept behind Western financial firms amassing African debt is that whoever controls Africa's debt - controls Africa's destiny. Africa's debt was created, ironically, because of sponsoring numerous liberation movements aimed at overthrowing colonialism. After dispossessing Africans of their land, colonialists established major commercial farms and established the private property system, in which land acquired a commercial value primarily evaluated in monetary terms. According to Moll (2021:11), the colonized world's (Africa) subjugation and economic exploitation were inextricably linked to the 2IR's technological and economic progress. Through colonization, the sovereignty and natural resources of Africa were dominated and controlled (Benyera 2021:16).

2.3.3 The Third Industrial Revolution 1960-2000s

According to Moll (2021:14), the Third Industrial Revolution (3IR) beginning in the 1960s is known as the “digital revolution,” “information age,” or the “network society.” This is in part because the internet and the World Wide Web (www) are the most essential inventions in the 3IR. In 1969, the US Department of Defense funded an internet project to connect computers at several universities using regular telephone lines. During the next decades, this platform expanded in popularity, but it remained largely known only by a few individuals until Tim Berners-Lee released a document-linking structure atop it in 1991, providing open standards for defining and transferring data which would become the World Wide Web as we know it today. The 3IR is best described under the umbrella term Information and Communications Technologies (ICT). According to Nuvolari (2019:38), there are four main technological characteristics of the 3IR namely, electronic components (semiconductors), computers, software, and network equipment. Examples of these may be (Lee and Lee 2021:145):

- electronic components - such as memory chips and ASIC (Application-Specific Integrated Circuit).
- computers - such as Personal Computers (PCs) and laptops.
- software - such as the internet, operating system (Windows, iOS, Android) and application software.
- network equipment - such as mobile phones or smartphones.

As the years progress, the devices and components become smaller and more powerful. In the 60s, computers used to fill the entire room and today it is more portable and can even fit in your pocket. The smartphone is a powerful device that includes many features and that can even be equated to computers. The internet, Personal Computers, and mobile phones are key to the 3IR (Lee and Lee 2021:145).

Fitzsimmons (1994:295) asserts that not only is the 3IR transforming the way we work, but it is also changing our views, definitions, and perspectives of the world and humanity. The driving force of the 3IR is the combination of computing, telecommunications, and emerging broadcasting technologies that connect and make the world a global village. Even though the economic effects of these digital technologies are probably more easily measurable, they also have significant social implications. The Internet is changing how people spend their free time and connect. Political and cultural expression have also dramatically expanded thanks to the Internet (Smith 2001:10). Through social media networks such as Facebook, Twitter, Instagram, LinkedIn, and Tik Tok; how are connected and able to communicate with family, friends, colleagues or even strangers, anywhere and anytime is limitless. People are likely to spend more time on social media networks than interacting physically with people who are nearer to them. The internet has become a virtual “place” to communicate, learn, search, do banking, entertain, and even “attend” church (Mokoena 2022).

Webster (2001:261) defines globalization as the increasing - and faster - integration and interconnectedness of interactions on a global scale, ties in which time and distance are "compressed." Industrial, media, financial, and intellectual connections are done on a worldwide scale, and we are all to a certain extent impacted by these trends. It could be through the meals we consume at home, how we work, social media networks or the media we engage in. It is also true that there are lived experiences that remain localized, but it does not take away the fact that we are digitally part of the global village. Moll (2021:16) elaborates that globalization is the driver of socio-economic transformations in the 3IR. Large companies have been driven to trade across national borders to maximize profit and cut manufacturing costs, thanks to networked technology. Companies have been able to do this either through offshoring (transferring manufacturing and operational processes to other countries) or outsourcing (having foreign businesses perform aspects of the operations). In his book

Information Technology and the Ethics of Globalization: Transnational Issues and Implications Robert Schultz (2010:4) mentions three major ethical problems when it comes to offshoring namely; (a) in industrialized countries, the loss of higher-wage jobs, (b) in low-wage countries, the exploitation of child and sweatshop labour, and (c) in low-wage countries, poor customer and technical support. Many low-skill assembly activities were shifted to Mexico and Asia beginning in the 1970s, while textile industries transferred their factories to "sweatshops" in India and Bangladesh. Services including software programming, call centres, and database management were routinely outsourced to developing nations by the 1990s (Moll 2016). In recent news, chocolate company Cadbury has been accused in a documentary for allegedly exploiting African children as young as 10 years old in Ghana to harvest cocoa pods to supply Cadbury which is owned by Mondelēz International. These young children are allegedly paid less than £2 a day as they cannot afford adult farmers (Ungoed-Thomas 2022). £2 is currently about 18.88 Ghanaian Cedi and when converted to South African Rands, it is about R4,24 of which the child labourer is earning less than that, working for many hours with a machete as tools in hostile environments.

Webster (2001:262) argues that globalization in its complexities is the continuation of imperialism in another form as it seeks to shape the world to conform with Western standards. Apart from conforming to Western standards, the West has control over Africa's media and finance (Benyera 2021:147). With globalization also comes global institutions to be "watchdogs" over many nation-states. Schultz (2010:16) lists international organizations which may or may not be currently operating as ethically globalized institutions:

- The United Nations and its agencies; the World Court
- World financial and economic institutions such as the World Bank, the International Monetary Fund (IMF), and the World Trade Organization (WTO). These institutions have ties to existing powerful states.
- Superpowers
- Multinational Corporations (MNCs)
- Non-Governmental Organizations (NGOs) without ties to existing states
- Websites with an international presence

It is not within this scope to discuss these global institutions but Schultz (2010:17) does note that there is a general issue with globalized institutions and refers to Immanuel Kant who was an 18th century philosopher who held the view that a world state was unsuitable if not viable. Of course, the context in which Kant held this view is different from the digital age of globalization. Kant in 1795 reasoned that it was paradoxical for a sovereign entity (a state) to have jurisdiction over another sovereign entity (the global state) (Kant 1970:102).

Yuval Noah Harari argues that because of advancements in transportation, communication, and technology, globalization has resulted in unprecedented levels of interconnection. This has resulted in both advantages and disadvantages, such as increasing affluence for some but also economic gaps, wealth concentration, and social inequality (Harari 2018). The single global culture is not homogeneous, but rather diverse and multifaceted. Globalization has enabled nations to share knowledge, products, and culture, but cultures remain distinct. People continue to adhere to cultural identities that are inextricably related to their past, geography, religion, and society. Cultural diversity survives despite globalization (Harari 2014). Globalization is inextricably linked to new technologies, and the automation and artificial intelligence that accompany it can have a significant impact on economies, society, and labour markets. These changes have the potential to result in job losses, inequity, and radical shifts in how people think and act (Harari 2018). According to Harari (2018), globalization necessitates global management systems to deal with the challenges that it entails. He argues that the current political and economic systems, which are mostly based on the nation-state, may be incapable of adequately addressing global issues. He advocates for increased international collaboration, international government entities, and shared responsibility among states to address globalization challenges.

On the impact of globalization in Africa, Benyera (2021:150) argues that the three previous Industrial Revolutions began in Europe and North America, with particular people, businesses, and organizations driving them forward. Industrial Revolutions have disproportionately enriched Euro-North America while exploiting, plundering, marginalizing, and subjugating Africa as well as the Global South. The argument that most parts of Africa are still stuck in the second or Third Industrial Revolution periods stems from the fact that Africa and other parts of the (formerly) colonized world have

not been fully integrated into the global economy and have never equally benefited from the past three Industrial Revolutions. Africa, therefore, in the 3IR has in most cases no control or ownership of its media and finance amongst other industries. For example, the French news channels Canal France International and France24 dominate Francophone African news, whereas the British Broadcasting Corporation (BBC) has control of news in its former colonies such as Nigeria. Portuguese media also dominate Lusophone African countries like Mozambique and Angola (Benyera 2021:147).

Globalization according to Castells (1999:3) is a "two-edged sword" on the one side, it enables nations to bypass economic phases by upgrading their production processes and increasing their competitive edge more quickly than in the past. On the other side, countries which seem to be unable to adjust or acquaint themselves with emerging technologies continue to be left behind in the information age.

The following section will discuss the impact of COVID-19 which is a recent portrayal of the "double-edged sword" of the information age where countries accelerated the use of digital technologies on the one side but also the inequality and marginalization of countries as well as countries that have been left behind on the other side. These disparities are also imminent depending on the socio-economic background of individuals within a country.

2.4 COVID-19 AND THE ACCELERATION OF DIGITAL TECHNOLOGIES

On the 11th of March 2020, the World Health Organization (WHO) announced COVID-19 (coronavirus) as a global pandemic (WHO, 2020). Subsequently, on the 15th of March 2020, South Africa's President Cyril Ramaphosa addressed the nation regarding COVID-19 and declared a national state of disaster in terms of the Disaster Management Act with several restrictions (Ramaphosa, 2020a). Baron and Pali (2021:1) mention three ways in which the COVID-19 pandemic can be interpreted; (a) COVID-19 as a tool to depopulate people across the world, particularly in Africa, (b) COVID-19 as a smokescreen by the Republic of China to destabilize the economies of other countries to rule the world, and (c) COVID-19 as Satan's war on the Christian faith or as punishment of sins by God. There is also another theory that COVID-19 is fake and a ploy to propel the new world order (Reuters 2020). Another could be a

natural disaster. However, it must be stated that the COVID-19 pandemic has claimed many lives around the world, many of whom are still fighting for their lives and others are affected in various ways post-COVID and cannot be reduced as fake. A theological discourse is needed regarding COVID-19 as a depopulation tool or China's ploy to destabilize other economies. However, the notion that COVID-19 is God's wrath on earth or Satan's war on Christians should be disregarded (Jordaan, 2020). The pandemic has hit several nations throughout the world, with Africa being the last continent to be affected. Africa, on the other hand, is projected to be the most susceptible continent, with COVID-19 spreading rapidly (Lone and Ahmad 2020:1300).

Many countries used various measures to mitigate the spread of the coronavirus by testing and treating patients, conducting contact tracing, restricting travel, quarantining people, and social distancing measures by restricting large gatherings (religious services, sports events, concerts, and schools) (Bawany 2020:31).

From the 26th of March 2020 to the 16th of April 2020, South Africa was placed on a nationwide lockdown for 21 days to mitigate the spread of COVID-19. The only people that were exempted from the lockdown were: public and private sector health workers, emergency personnel, and public safety personnel (police, soldiers, security). The exemption also covered people who work in the manufacture, distribution, and supply of food and basic commodities, as well as those who provide critical financial services, electricity, water, and telecommunications maintenance, laboratory services, and medical and hygiene items. The majority of the people were not allowed to leave their homes unless it was med for medical reasons, to purchase food, medication, and other necessities or collection of social grants (Ramaphosa 2020b). Most non-essential shops, public facilities, public gatherings, governmental departments, educational institutions, travel, and churches were closed and prohibited. After the initial 21 days of lockdown, the lockdown was further extended as COVID-19 was a struggle to contain (Dlamini-Zuma 2020; Arndt et al. 2021).

The lockdown was then categorized into a five-level COVID-19 alert system to mitigate and manage the lockdown as follows (South African Government, 2022):

> (a) 'Alert Level 1' indicates a low COVID-19 spread with a high health system readiness.

(b) 'Alert Level 2' indicates a moderate COVID-19 spread with a high health system readiness.
(c) 'Alert Level 3' indicates a moderate COVID-19 spread with a moderate health system readiness.
(d) 'Alert Level 4' indicates a moderate to high COVID-19 spread with a low to moderate health system readiness.
(e) 'Alert Level 5' indicates a high COVID-19 spread with a low health system readiness.

COVID-19 undermined years of progress and effort in eliminating poverty, not only bringing countries to a halt but also removing jobs and terminating lives prematurely (Thinane 2021:4). Bawany (2020:31) states that COVID-19 is more than just a health crisis, it is also a worldwide economic disaster that has impacted the lives of countless individuals, families, and companies. The effect of the coronavirus has the possibility of causing severe socio-economic and political issues that will last for generations.

Due to the lockdown, where physical contact was prohibited, many people had to meet and communicate virtually. The internet as well as technological devices were essential during COVID-19 and there was also growth in the ICT sector. The following subsection will discuss the impact of COVID-19 and its acceleration of digital technologies. First, the socio-economic landscape of South Africa will be discussed as well as the impact of COVID-19 especially to the most vulnerable in society. Second, the impact of COVID-19 on the education system especially Higher Education institutions and the adoption of emergency remote teaching and learning. Lastly, the impact of COVID-19 on the Christian church and its acceleration to the digital church.

2.4.1 COVID-19 and its socio-economic impact

South Africa has been dubbed the most unequal country in the world by the World Bank (2022). South Africa's Black majority experienced three key difficulties before the COVID-19 pandemic: unemployment, inequality, and poverty (Odeku, 2021). The COVID-19 pandemic has thus exacerbated conditions for the already poor and marginalized. According to estimates, from February to April 2020, between 2.2 and 2.8 million individuals in the country lost their employment because of the lockdown (Posel et al. 2021). Estimates also show that the hardest hit by the pandemic are low-

income households many of whom were in the informal sector (Simon and Khambule 2021:2). Benhura and Magejo (2020:4) describe informal workers as regular and casual workers who do not have a signed employment contract, as well as own-account workers/employers who are not registered for income/value-added tax. Most who work in the informal sector are informal settlers who work as domestic workers, gardeners, waiters, and vendors (Nyashamu et al. 2020:1447). Simon and Khambule (2021:4) assert that many in the informal sector live from hand to mouth and as the lockdown prevented their livelihoods, it pushes them deeper into poverty. On the other hand, the minority wealthy people have more security and can stay afloat during the lockdown, but the majority simply cannot afford so even for one day.

Visagie and Turok (2021:52) point out that a distinction needs to be made on the impact of the pandemic in cities, towns, townships, and rural areas as different places are affected and cope differently. The response of an area is determined by several characteristics, including its demographics, industrial mix, workforce skills, sources of revenue, and the strength of local institutions. For example, the metros have a broader and more diverse economic structure, which includes knowledge-intensive industries. They have stronger expertise and digital infrastructure, which means they may be better equipped to deal with a lockdown. Smaller towns have more focused economies, with specific strengths in industries like mining, tourism, and government administration. Rural areas are the most vulnerable, with minimal levels of economic production and only a few areas of agricultural production. Recognizing these disparities is critical for governments to coordinate a more targeted response that is successfully customized to a variety of local situations (Visagie and Turok, 2021:52).

The South African government announced an R500 billion social relief and economic assistance plan on the 21st of April 2020. This was supposed to be used to help companies pay salaries (Temporary Employer/Employee Relief [TERS]), offer direct social benefits to the local population (increased older persons and child support grants, and introduce R350 social relief grant for unemployed), and provide financing to small enterprises affected by the lockdown, such as the informal sector (Ramaphosa 2020b). Benhura and Magejo (2020:4) argue that the first TERS was just for UIF-registered (Unemployment Insurance Fund) companies and workers, leaving out informal workers who were later included. Informal workers were later added to TERS because the Minister revised the laws on May 25 in response to a forthcoming

court hearing, allowing workers to apply directly and extending TERS to workers who are not registered for UIF (Rogan and Skinner 2020:8). Although informal business support was available, there are however, barriers such as being registered with CIPC (Companies and Intellectual Property Commission), SARS (South African Revenue Service) and UIF or to register before application is approved. This is the same as registered businesses which causes delays or not receiving the support at all (Benhura and Magejo 2020:4; Rogan and Skinner 2020:11).

Many businesses therefore did not survive the pandemic, many are still recovering, and others have no hope of reopening which causes depression (Odeku 2021:1). Nyashamu et al. (2020:1450) attest that when people lose their jobs or business stability, depression induced by economic suffering is related with shame in many African communities. Depression is a serious health concern in informal settlements and may cause many social ills such as crime, substance abuse, and domestic violence.

2.4.2 COVID-19 and its impact on the education system

According to Mhlanga and Moloi (2020:1), the World Bank estimated that school closures have left 1.6 billion learners and students out of school. The government of South Africa was compelled to implement a nationwide lockdown, whereby schools and universities were completely closed. Many educational institutions opted for remote learning or e-learning as the substitute mode of learning while others also used free TV channels for those who cannot afford the internet (Sharfuddin 2020:250). Le Grange (2020:2) argues that COVID-19's shift to online learning/teaching exposed the digital gap, as low-income students struggle to get devices and/or internet connection, and those who have returned home from university residences may not have appropriate study conditions. Wangege-Ouma and Kupe (2020:10) attest that university residences for many students are a haven for poor students or those who come from unstable family environments as many students' main source of food, health care, and support services (mental health counselling) are found on campus.

The South African education system was not prepared for the shift, but Higher Education Minister Blade Nzimande and stakeholders were determined in their adopted theme to "save the academic year – save lives" (Nzimande 2020a). This is a

challenge because out of the 26 public universities in South Africa, only one is specialized in distance learning – the University of South Africa (UNISA). Therefore, the majority of the universities are contact institutions with a lack of online education that is ideal for emergency distance learning. Even so, UNISA was also struggling during COVID-19 (Wangenge-Ouma and Kupe 2020:10). COVID-19 has thus forced educational institutions to operate in a hostile environment because of the emergency, the focus has shifted to survival – "emergency remote teaching" (Jili et al. 2021:2). Emergency remote teaching differs from pre-planned online learning in that they provide teaching and learning in a crisis (Whittle et al. 2020:1; Hodges et al. 2020:1).

Hedding et al. (2020:1) state that it's not the first time for universities in South Africa to employ emergency remote learning as some universities were conducting emergency remote learning because of the nationwide #FeesMustFall student protests in 2015. The difference with COVID-19 is that almost all sectors of society have been prohibited from operating.

To evaluate the technological challenges of institutions during COVID-19, it is important to understand the higher education context in South Africa. According to Wangenge-Ouma and Kupe (2020:9), there are two types of universities stemming from historical inequalities; (a) well-resourced and mostly situated in major urban centres, and (b) under-resourced and primarily situated in marginalized areas. The ICT systems in South African universities are thus not the same and the response to COVID-19 was different based on the resources, technical knowledge, and digital systems in place. Ng'ambi et al. (2016) wrote an article *Technology Enhanced Teaching and Learning in South African Higher Education – A Rearview of a 20-year Journey* highlighting the inequalities of ICT in institutions better known as the digital divide. Since the *Green Paper for Post-school Education and Training* in 2012, which is not as detailed in addressing ICT inequalities in institutions, there has been no national policy on ICTs in Higher Education (Department of Higher Education and Training 2012).

Against this background, COVID-19 exposed these digital inequalities in higher education institutions. Although universities would operate within the national framework during COVID-19, each would have to have their plans and strategies to continue the academic year through remote learning. Nzimande (2020b) states that to

ensure a suitable level of academic assistance to all students at institutions to continue academic learning and teaching support, there is in place the development and implementation of multi-modal remote learning systems (digital, analogue, and physical delivery of learning materials). All available resources should be used to reach students in these uncertain times so that no student is left behind. COVID-19 has thus forced the acceleration of digital technologies in higher education institutions.

Some of the measures to save the academic year, especially for most disadvantaged students included but were not limited to zero-rated educational websites, 10GB daytime and 20GB night-time internet data, and provision of digital devices (laptops) borrowed to students (Nzimande 2020b). The challenge with these measures is that the rollout especially of laptops was a mammoth task and therefore a slow process for all students to receive it on time. Digital literacy was also a challenge as some students were struggling with navigating online learning. The home environment of most students may not be suitable for learning due to various factors. Students in remote areas or areas where there is a lack of infrastructure for internet connection hindered their online learning experience. Hedding et al. (2020:1) state that not only did students struggle, but academic staff also had challenges with the shift to emergency remote teaching from home. Academics had to familiarize themselves swiftly with online learning systems, and the ability to teach online, including additional administration.

It should also be noted that some contact universities were utilizing blended or hybrid learning which made the transition to online learning easier (Wangenge-Ouma and Kupe 2020:11). According to Saichaie (2020:96) blended learning combination of face-to-face and online teaching and learning. Hybrid learning, on the other hand, is defined by the planned utilization of technology to replace a specified amount of class time to establish a learning experience for students. However, this was not the case for all contact universities. Le Grange (2020:2) mentions that Lecturers' advanced abilities for emergency remote teaching could not be trained overnight, and university support services would be overburdened during COVID-19 since they were not equipped to deal with the now-increasing quantity of online programs. Furthermore, lecturers and support personnel would be working from home during lockdown, which, in many cases, would not equal the resources available on university premises.

To close the inequality between universities, the Department of Higher Education needs to assist in updating its policies on ICT in institutions as well as provide the necessary support for all institutions to a blended or hybrid approach to teaching and learning.

2.4.3 COVID-19 and its impact on the church

The church is the gathering of believers, and its worship services are in most instances face-to-face. During COVID-19, the church was forced to conduct its services online which was a different form of fellowship than what was used to (Pillay 2020:266). Baron and Pali (2021:2) state that during the COVID-19 pandemic, several existential issues emerged, including whether or not God is involved in these pandemics. are pandemics a result of sin and punishment from God? How can God allow so many people to be affected by the pandemic? Does God exist? What do we need to do to be right with God? Although these are not new questions, during the HIV and AIDS pandemic, these questions were raised by theologians such as Madipoane Masenya in her article *Between unjust suffering and the" silent" God: Job and HIV/AIDS sufferers in South Africa* (2001). In regards to COVID-19, Danie Veldsman in *God's spirit (of wisdom) has been sent into the world, not COVID-19: A contextual systematic-theological perspective* (2020), discusses the viewpoints of Wilhelm Jordaan that it is foolish to understand COVID-19 is a punishment from God or nature's way of restoring equilibrium (Jordaan 2020). Veldsman agrees with Jordaan, however, Jordaan's article lacks hermeneutical guidelines for making sense of the pandemic which Veldsman suggests. Veldsman (2020) argues for adopting a different image of God, a "silent God" rather than the usual "God Almighty" image. This image of a "silent God" challenges us to have wisdom and personal responsibility in handling the pandemic issues. This stance is helpful for your ongoing theological discussions to make sense of the pandemic.

According to The Citizen (2020) self-proclaimed Prophet Bushiri preached at his congregation in South Africa that COVID-19 is a sign of the end of times, and that coronavirus is a "demon" and would disappear if the church prayed.

During the 21-day lockdown in South Africa Christians fervently quoted Isaiah 26:20 (NIV) to reflect on the COVID-19 lockdown:

> Go, my people, enter your rooms
> and shut the doors behind you;
> hide yourselves for a little while
> until his wrath has passed by (Isaiah 26:20)

The reflection on this Scripture was that Christians should understand the lockdown as a time to strengthen their relationship with God away from their busy life. Bentley (2020:3) attests that the use of Scriptures such as Isaiah 26:20-21by some African Pentecostal movements described COVID-19 as a curse which needs repentance. Mzondi (2022:6) mentions that the lockdown necessitated organized prayer and fasting for the nation to be healed from the coronavirus.

The church was thus challenged with how to stay connected during the COVID-19 lockdown as well as reflecting anew about God amidst the pandemic. Every religious assembly was outlawed. The churches were unable to commemorate Holy Week, Easter, or Pentecost. There was a backlash at first because gathering to pray, worship, and rejoice is an important element of the Christian religion (Pillay 2020:267). Therefore, the church had no other choice than to conduct its services through digital platforms to reach its members. These services included digital worship, sacraments, preaching, tithes, and missions which fast-tracked the digital church (Pillay 2020:267). The church throughout history, has been resistant to change to change and has tended to not want to deviate from its traditions. Dreyer (2019) in his article *Being church in the era of 'homo digitalis'* makes interesting observations that the 21st-century church is not the same as the church in the 1st century CE, to which the church wants to hold on to its tradition. The digital era which cannot be ignored could be the end of the church as we know it, or it could provide a new opportunity "to be church" in the 21st century. Beukes (2020:5) points out that the opportunity could be the capacity to interact with millions of people through digital channels may make it easier to spread the gospel. Church services can be continued through live streaming, video recordings, audio recordings, daily devotions, internet exchanges, and other means. The challenge with the digital church in South Africa is that it becomes a barrier for those who are not tech savvy, who do not have adequate technological devices (for

WhatsApp, YouTube, or Facebook) and who cannot afford internet data which is expensive.

Although pastors were not regarded as essential workers, they were allowed to facilitate funerals and provide pastoral care to bereaved families and the elderly, but only under strict COVID-19 regulations (Mzondi 2022:8). The pastor's role during COVID-19 was however essential for the community as they frequently sought assistance and comfort during times when many people lost their livelihoods and loved ones, also people dealing with mental health problems and struggling with their faith during the difficult times (Naidoo et al. 2021:2). The church also played a role in supplying food parcels to the most vulnerable in society. Pastors also had their challenges during COVID-19. Mzondi (2020:80) states that unfortunately, several pastors became infected with COVID-19 while offering pastoral care and support to mourning families and conducting funerals. Many congregations were financially strained which affected the livelihood of the pastor and their families. Pastors thus risked their lives doing pastoral care and some even died because of COVID-19.

The COVID-19 pandemic has challenged the church on what it means to be a church in times of crisis and the digital era. Some congregations continued with the digital church simultaneously with the face-to-face fellowship when the lockdown was eased, to reach members who were either sick at home, had other obligations, or were not ready to join the physical services. This may even become a norm for the church to have more presence in cyberspace where people can access church services anytime and anywhere.

The next section will discuss the Fourth Industrial Revolution (4IR) in the African context.

2.5 4IR IN THE AFRICAN CONTEXT

According to Schwab (2016:12), what differentiates the 4IR from the previous Industrial Revolutions is the convergence of different technologies and integration across the physical, digital, and biological. The technologies associated with the 4IR are but not limited to AI, bioengineering, internet of things, robotics, self-driving cars, three-dimensional (3D) printing, nanotechnology, quantum computing, virtual and augmented reality, and material science (Fourie 2020:13). Marwala (2021b:3) states

that 4IR is an era in which intelligent machines will do duties that were previously only performed by humans. Marwala (2021b;5) categorizes the 4IR as follows:

- Cyber (digital) - AI, Blockchain, Quantum, Internet: 1.0 (internet begins), 2.0: (Social networks), 3.0: (internet of markets), 4.0: (Internet of Things and Internet of Education Things) enabled by 5G technology
- Physical - 3-D Printing; Robotics; New Materials; graphene
- Biological - Biomedical Engineering; Biotechnology

In South Africa, the 4IR has been embraced by President Cyril Ramaphosa in his first 2018 State of the Nation Address (SONA) and by setting up the Presidential Commission on 4IR (Ramaphosa 2018). Subsequently, the report of the Presidential Commission on the 4th Industrial Revolution (PC4IR) of South Africa (2020) was published. The report acts as a guide on the government vision of 4IR in South Africa and how it will be eventually employed. The report will be analysed later in the thesis as well as other policies on the 4IR in Africa.

2.5.1 Briefly defining the main 4IR technologies

This subsection will briefly define the following key 4IR technologies: Artificial Intelligence, Internet of Things, bioengineering, 3D printing, nanotechnology and, robotics, virtual and augmented reality.

2.5.1.1 Artificial Intelligence

Artificial Intelligence is the ability of machines to imitate human intelligence, capable of self-learning and able to accomplish complicated tasks with minimal to no human control (Fourie 2020:13). Although AI is popular today, it is not a new phenomenon. The book *Artificial Intelligence: A Modern Approach* by Stuart Russel and Peter Norvig (1995) states that the history of AI started as a theoretical design in 1943 by Warren McCulloch and Walter Pitts, which was followed in the early 1950s in experimentations of individuals such as Claude Shannon and Alan Turing. AI was coined and established as a field in 1956 at the Dartmouth Summer Research Project on AI. Early AI however had many limitations because of minimal computer power at the time,

misdirected enthusiasm, and lack of funding. Over the years, AI has progressed and its full potential is yet to be realised.

There is a misconception when it comes to AI, Broussard (2018:32) makes a distinction between two types of AI, the one we want (General AI, Artificial General Intelligence [AGI], or strong AI) and the one we have (Narrow AI, Artificial Narrow Intelligence [ANI], or weak AI). General AI is the Hollywood version of AI, which has intelligent robots that "think" like humans, having a mind inside a computer. Movies such as *The Matrix* (1999), *Iron Man* (2008), *Star Wars* (1977), *Ex Machina* (2015) and *The Terminator* (1984), express types of AI that are science fiction or made-up. Narrow AI, on the other hand, is a mathematical prediction tool, which, therefore, analyses a pre-existing dataset to identify trends and possibilities in that dataset. It thus codifies those trends and possibilities into a computer construct known as a model. The model is a black box into which we may input data and obtain a response (output) (Broussard 2018). Examples of narrow AI are image and facial recognition systems, chatbots and conversational assistants (Siri, Google Assistant, and Alexa etc.), self-driving vehicles (Tesla), predictive maintenance models, and recommendation engines (Labbe and Wigmore 2023). Within narrow AI, there is also generative AI which generates text, images, audio, or videos using a prompt. The most famous generative AI is ChatGPT which generates various text using a prompt (Krishna 2023). Narrow AI can be either reactive or have limited memory. Reactive AI reflects human behaviour without any data storage, while the more advanced Limited Memory type has the capacity for data storage and can interpret data precisely. This type of AI, with its great memory and data storage capabilities, is used frequently in Deep Learning and is known for its accuracy (Gupta 2022).

When we speak of "intelligence" in AI, the question can be raised, how do machines learn? According to IBM (2022) machine learning (ML) is an area of AI and computer science that focuses on using data and algorithms to mimic the way people learn, intending to steadily improve authenticity. Humans and computers do not learn in the same way. An algorithm is a computational process for obtaining an outcome like making tea, there are steps one takes to make tea (Broussard 2018:7).

2.5.1.2 Internet of Things (IoT)

The IoT is a term that refers to a combination of physical “things” with internet-connected gadgets that can transmit information (data) from their surroundings to other devices in the network (Lee 2018). The “things” referred to may be physical objects such as vehicles, buildings, smart homes, wearable devices, industrial equipment, medical devices, agricultural equipment, transportation, and even smart cities. Fourie (2020:14) states that IoT is a network of interconnected devices and sensors embedded in a variety of everyday objects. The functionality is to transmit data between the object and the internet which are analysed in real-time and used to make adjustments. One of the key features of the IoT is the ability for devices to collect and share data without human intervention. This can lead to increased automation and improved decision-making in a wide range of industries, including manufacturing, transportation, and healthcare. IoT also presents data, security, and privacy risks and concerns that must be considered as technologies are prone to vulnerabilities. As IoT collect and share large amounts of data, they can be vulnerable to hacking and other cyber-attacks. Additionally, the use of IoT devices can raise privacy concerns, as individuals may be uncomfortable with the idea of their personal information being collected and shared without their knowledge or consent (Arora et al. 2019).

2.5.1.3 Bioengineering

Bioengineering, also known as biomedical engineering, is an interdisciplinary field that combines the principles of engineering, biology, and medicine to develop new technologies and solutions for healthcare and medical research. Bioengineers work with other medical professionals, such as doctors and nurses, to design and create medical devices, diagnostic tools, and therapies that improve patient outcomes and reduce healthcare costs (Britannica 2019). It includes the modifying of human DNA to eliminate sickness and potentially, death (Fourie 2020:14). From heart disease to cancer, many of our stubborn health problems have a genetic link. As a result, the capacity to assess our genetic makeup in timely and cost-effective techniques would redefine targeted and beneficial treatments (Schwab 2016:24).

2.5.1.4 3D printing

Unlike traditional manufacturing processes that take far longer to produce a product, 3D printing allows for the design, prototype, and manufacture of components or products faster than previous techniques without material waste (Fourie 2020:15). 3D printing (three-dimensional printing), also known as additive manufacturing, is a process of creating a physical object from a digital model by building it layer by layer. The process starts with creating a 3D model using computer-aided design (CAD) software. The model is then exported to a printer, which reads the file and creates the object by adding successive layers of material, such as plastic or metal until the final product is complete (Britannica 2022). 3D printing is employed to create small or big products such as wind turbines, solar panels, or medical items (Schwab 2016:20). Shava (2022:136) mentions a few examples of 3D printing in South Africa; a private company (Rapid 3D) has established itself as a key manufacturer of 3D printed equipment such as fuel nozzles, dental and other medical devices. Zambia, Kenya, and Nigeria also have 3D printing projects for various products.

2.5.1.5 Nanotechnology

According to the National Nanotechnology Initiative (2022), Nanotechnology is the study of science, engineering, and technology at the nanoscale, which is measured in nanometres which are extremely tiny objects. At this scale, the properties of materials can be different from their bulk counterparts, and scientists and engineers can take advantage of these unique properties to create new materials, devices, and systems with improved performance and functionality. Nanotechnology has applications in many areas, such as electronics, medicine, energy, and materials science. Fourie (2020:16) states that it is the idea of making extremely small robots or nanobots from individual atoms that intrigue scientists the most. The possibilities of nanobots are that millions of these could injected into the body to identify infections or cancer as well as remove harmful germs and poisons or aggressive cancer cells and tumours.

2.5.1.6 Robotics

Robotics is the field of science and engineering that deals with the design, construction, operation, and use of robots. Robotics technology encompasses a wide

range of disciplines, including mechanical engineering, electrical engineering, computer science, and artificial intelligence. Robotics engineers use these disciplines to design, build, and program robots that can perform a wide range of tasks, from simple repetitive tasks to complex problem-solving and decision-making (Britannica, 2022). Robots can be classified into different categories based on their form and function such as industrial robots, service robots, and mobile robots. Robotics technology is advancing rapidly, making robots more sophisticated and capable. According to Fourie (2020:14), robots with artificial intelligence are increasingly demonstrating unique personalities and human emotions; they can recognize and recall humans, and their personalities "evolve" to adapt to their owners' preferences. They can read users' facial expressions, speech patterns, and language patterns, initiate conversations on their own, and imitate emotions such as empathy.

2.5.1.7 Virtual and augmented reality

Virtual Reality (VR) and Augmented Reality (AR) are contemporary phenomena that are touching practically every sector and are poised to alter how we perceive and interact with our environment (Halabi et al. 2020:258). There is confusion when it when it comes to VR and AR as well as Mixed Reality (MR). MR settings bridge the gap between the physical and virtual worlds. It combines the physical and virtual worlds to create complex landscapes in which physical and digital components interact instantaneously. Augmented Virtuality (AV), on the other hand, is a virtual environment that incorporates real-world aspects, similar to how AR augments the actual world with virtual features (Halabi et al. 2020:259). There are current conversations about the metaverse which is a post-reality realm that combines physical reality with digital virtuality in a continual and persistent multiuser environment. It is built on the convergence of technologies such as social networks, virtual reality (VR) and augmented reality (AR) that enable multimodal interactions with virtual environments, digital items, and people (Mystakidis 2022).

2.5.2 The 4IR and 5IR: Key differences

There are currently also conversations around the 5IR or industry 5.0. Although the origin and date of the 5IR term's development are unknown, it has been reported in

widely read press publications and websites such as Pratik Gauri and Jim Van Eerden *What the Fifth Industrial Revolution Is and Why It Matters?* (2019) and Aryu Networks *What Will the 5th Industrial Revolution Look Like?* (2020) (Noble et al. 2022). To promote study along these lines, manufacturing research also acknowledges the 5IR as demonstrated by special issues of the Journal of Manufacturing Systems, International Journal of Production Research, and IEEE Transactions on Industrial Informatics (Noble et al. 2022). According to Xu et al. (2021), the introduction of the 5IR has been the subject of sporadic academic initiatives since 2017. After discussions among participants from research and technology organizations as well as funding agencies across Europe in two virtual workshops organized by the Directorate "Prosperity" of the Directorate-General for Research and Innovation, on the 2nd and 9th of July 2020, the European Commission formally called for the Fifth Industrial Revolution (Industry 5.0) in 2021. This was done by the formal release of the document titled "Industry 5.0: Towards a Sustainable, Human-centric, and Resilient European Industry" (2021).

The 5IR is not yet fully defined but it is expected to be even more advanced and disruptive and to bring even more integration of technology in all aspects of human life and society. However, it is expected to build upon the advancements of the 4IR which is characterized by the integration of physical, digital, and biological technologies in a way that creates a more holistic and interconnected system. One key difference between the 4IR and 5IR is the level of integration and interconnectedness between technologies and human beings (Noble et al. 2022). While the 4IR focuses on digitalization, and automation of many tasks through the use of robotics and AI, it is believed that the 5IR will fulfil societal goals other than jobs and growth but toward technology valuing the well-being of the planet and human beings (Xu et al. 2021:530). The 5IR is thus different from the 4IR in that it emphasizes collaborative synergy rather than rivalry (and possible replacement). In other words, the 4IR aimed to broaden the range and number of new technologies in industrial, service, and retail contexts so that humans and robots would fight for jobs and technology would be used to its fullest. Instead of focusing on where each actor succeeds and how humans and technology can work together, the 5IR shifts its emphasis to understanding where each actor excels. The 5IR fundamental tenet is that humans and technology should work closely together to take advantage of each other's advantages and make up for each other's

disadvantages (Noble et al. 2022). Humans and robots "dancing together" is how Gauri and Van Eerden (2019) symbolically define this kind of teamwork.

Although the 5IR is important to study, this thesis will not focus on it mainly because it is theoretically futuristic and 4IR is currently developing and has not yet reached its fullest potential. The following sub-section will discuss the critique of the 4IR.

2.5.3 Critique of the 4IR

Moll (2021:29) argues that these technologies that are mentioned are just continuous versions of the 3IR as there is minimal evidence of a drastic socio-economic transformation. He asserts that the 4IR is a myth and an ideology to benefit the powerful because globalization “is in trouble” but does not give reasons or analysis for the argument. He does however suggest that the 4IR does not fit into the criteria of Industrial Revolutions as the previous three do. Moll (2020) argues regarding Africa that the previous three Industrial Revolutions dehumanised and used Africans as slaves, exploited Africa’s land and natural resources, and kept Africa in debt to control its sovereignty. He is therefore pessimistic that the 4IR is likely to change from this paradigm but will continue to exploit Africa in advanced ways. Benyera (2021:33) asserts that the 4IR is the recolonisation of Africa and dispels the notions that the adoption and utilisation of 4IR in Africa will result in Africa being able to compete in the global economy. Benyera (2022:4) admits the 4IR is inevitable and Africa has two options, either for the 4IR to be a curse like the previous three Industrial Revolutions or an ideal situation to use the 4IR as a tool to address problems in Africa, however, Africa should participate autonomously.

Sutherland (2020:233) on the other hand, states that the 4IR is a rhetorical tactic lobbied by manufacturers and the World Economic Forum (WEF) rallying to establish specific economic policies and commercial futures based on 4IR technologies to minimize their negative socio-economic repercussions. These policies, however, have the potential to drive mass unemployment, lower wages, and exacerbate inequality. Sutherland (2020:234) further articulates that South Africa is an unlikely place for 4IR since its economy is still based on farming, mining, and the informal sector. It is plagued by severe unemployment, with most of its people lacking technical (digital literacy) and, in many cases, fundamental skills (reading, writing, or comprehension).

It should be noted that across the world, countries are not on the same page regarding the Industrial Revolution with stark differences between the global North and the global South. Some are still in the second and barely coping with the Third Industrial Revolution. The state of 4IR in Africa, Benyera (2021:118) argues that except for Egypt, Tunisia, and South Africa, most African countries have yet to finish the 2IR and 3IR. Countries like the Democratic Republic of the Congo, Somalia, and Libya are reverting to the 2IR. Benyera (2021:151) further argues that without the proper 3IR infrastructure in place, Africa will left behind in the 4IR. South Africa has only limited 4IR technologies at present and the previous section on the impact of COVID-19 in accelerating digital technologies has illustrated that South Africa is struggling in the 3IR due to a lack of infrastructure, internet connectivity, technological devices, and digital literacy. Although the majority of South Africans own smartphones, many households lack internet connection, and rural areas have little to no network infrastructure at all.

2.5.4 COVID-19 as an acceleration of the 4IR

Although COVID-19 was devastating in all aspects of life, Lugayizi (2021) states that one positive aspect of it was the acceleration of the 4IR. For example, as part of the medical response to the epidemic, 3D printing was employed to make ventilators and personal protective equipment (PPE) in a faster way than traditional manufacturing. Massive volumes of data regarding the virus, its spread, symptoms, and the demographics and comorbidities that influenced patients' odds of infection and recovery were stored and analysed using big data. Big data may assist in providing more accurate analytics and decision-making to reduce the pandemic's harmful impacts on people and the economy. The regularly updated big data can also be used to predict patterns of new epidemics, which seem unavoidable. Dwolatzky (2020) states that COVID-19 forced countries into the "new normal" such as social distancing, working from home and rapid use of digital technologies. These differ with every sector which had different approaches to the "new normal." Medical practitioners utilized apps such as WhatsApp and Zoom to communicate with patients. The health sector also used data visualisation technologies creatively like Google's Data Studio to consolidate and depict COVID-19 data in digital formats. The emergency remote teaching and learning in the education sector increased online learning which has

been attempted for many years. The justice system was also forced to utilize digital technologies like Zoom as a virtual courtroom which has been one of the most hesitant professions to embrace digital transformation until the lockdown happened.

Marwala (2020b) states that the 4IR is no longer a theoretical notion that will be implemented in the future, but it has arrived, and COVID-19 has presented an opportunity for radical digital transformation not only for education but also for the future of work. Van Niekerk (2020) points out that working remotely has changed the dynamics of the workplace where managers had to learn new ways of managing and employees had to learn how to manage "work time" and "family time." Post-COVID-19, there will be a need to be a revaluation of the continued use of the future of education and work using digital technologies.

2.5.5 Ethical Implications of the 4IR

With every Industrial Revolution, there should be ethical consideration and the 4IR is not exempted from that. The main question here is how the ethical implications differ from the previous Industrial Revolutions. There are implications we can physically see such as job loss, and lack of access to digital technologies but what about implications that we cannot see and yet directly impact aspects of our lives? In the 4IR, data is commodity-driven by AI (Peckham, 2021:30). Bryson (2020:4) explains intelligence is the ability to do the correct thing at the appropriate moment. It is the capacity to respond to a situation's possibilities and difficulties. The adjective "artificial" in the term artificial intelligence, refers to something that has been created by human agency. AI can only exist if and when it is designed for a purpose.

When AI is designed, it is not neutral since there are people behind the design who have their own biases based on their race, class, gender, religion, or socio-economic status. Human language incorporates our inherent preconceptions, and these preconceptions often match our lived experience (Bryson 2020:15). According to Coeckelbergh (2020:127) there are several reasons biases happen in AI which are frequently unintended; it may be a lack of understanding of the AI system, a lack of awareness of the problem of bias, or even of their prejudices, or a general inability to conceive and contemplate the technology's unintentional implications.

Two prominent documentary films that illustrate these biases in AI are *The Social Dilemma* (2020) and *Coded Bias* (2020). *The Social Dilemma* looks at how the algorithm and architecture of social media feed addiction, manipulate people's beliefs, emotions, and behaviour, and spread conspiracy theories and misinformation to maximize profit. Our online presence (what we search, what we do, what we like, who we like) is being tracked which is called our digital footprint. This information thus makes up our digital selves on the internet (which may be different to our real lives). *Coded Bias* follows MIT Media Lab researcher Joy Buolamwini's findings that the algorithms in facial recognition do not recognise dark-skinned people correctly. Only when she puts on a white mask does the facial recognition recognise her. The documentary highlights the harms of such algorithms, which perpetuate historical discrimination. Broussard explains that “our ideas about technology and society that we think are normal are ideas that come from a very small and homogenous group of people. But the problem is that everybody has unconscious biases and people embed their own biases into technology” (Coded Bias 2020). Buolamwini makes a point that “AI is based on data and data is a reflection of our history. So, the past dwells within our algorithms” (Coded Bias 2020). The bias in algorithms can be harmful to people who are discriminated against in this way.

There are positives and negatives of AI. In 2018, London police made their first arrest using facial recognition technologies. In the same year in New Dehli, India, the police allegedly identified 3,000 missing children in four days using facial recognition technologies. A suspected drug trafficker was arrested in Brazil after being recognized by facial recognition. There were also arrests in Colorado, in the United States of an accused credit card fraudster and a rapist (Campbell 2019). More and more countries are using facial recognition but the surveillance in China is more extreme, which infringes on the rights of people. In the United States, there are also cases of AI being used in the justice system to predict re-offenders that are biased against Blacks. Angwin et al. (2016) conducted a study on more than 7000 people arrested in Broward County between 2013 and 2014. The algorithm was more prone to mistakenly designate black offenders as future criminals, doing so at nearly double the rate of white defendants. White offenders were more frequently mislabelled as low-risk than black offenders. They used a statistical test to separate the influence of race from other factors such as criminal history and re-offending, as well as the age and gender

of the defendants. Despite this, the algorithm projected Black offenders as 77 per cent more likely to commit a future violent crime and 45 per cent more likely to commit a future crime of any type.

According to Dastin (2018), when Amazon used an AI recruiting tool, it was discovered that it was biased against women. Amazon's computer model was taught to screen applicants over 10 years by looking for trends in applications submitted to the firm. Many of the submissions were from males, reflecting the industry's male dominance. The system thus produced information that only males are preferred over women and therefore rejected all women's applications. Facebook conducted an experiment on users for the 2010 US congressional elections and with only a single election-day Facebook message, Facebook was able to influence about 340,000 people to go out and vote (Corbyn 2012). This showed that social media is powerful and can have real-life consequences. Also, it was Facebook that disclosed this information, in other words, if they had not, we would not have known because they are unregulated. Microsoft designed an experimental AI bot called Tay on Twitter and the purpose was for Tay to interact and learn from users. Within 24 hours, Tay tweeted hateful comments learned from Twitter users and was eventually shut down by Microsoft (Kraft 2016). The AI in Tay could not make a moral judgment and relied on the information that was fed to it.

Much of these AI technologies are unregulated which could lead to serious ethical implications. If the tech companies are left unchecked, historical injustice may persist through AI. There needs to be an understanding that AI technology is not neutral and mechanisms should be applied for the design of AI technologies not to discriminate, dehumanize, and subjugate people. There cannot be an over-reliance on AI to predict and further make decisions in our lives. As much as there are positives, private companies are more interested in maximising profits over the rights and privacy of people.

2.5 CONCLUSION

This chapter has mentioned that technology is a human trait and therefore discussed African epistemologies of technology from ancient Africa. Before colonisation, African ethnic groups used various techniques to navigate life. African Indigenous Knowledge Systems (AIKS or IKS) represent a field of scholarship that researches ancient African communities. IKS does not claim to be “universal,” unlike Western science because they are specific to a community. One aspect of AIKS or ancient African technologies was that they served a particular need in the community which in turn was sustainable for the environment. Some African communities had their forms of indigenous knowledge systems such as mathematics, astronomy, writing systems, and metallurgy. Mapungubwe and Great Zimbabwe were also pre-historic civilizations in Southern Africa with advanced social complexities, technology, and international trading. Thus, African societies were not homogenous and had their level of development based on the needs of that particular society. Technology in African societies is thus not a new phenomenon. African societies had their disruptions in history that discontinued these ancient knowledge systems whether by natural causes (disasters) or various conflicts (war). Although Africa is no longer the same as in ancient times, there are still communities that have held on to old ways of doing things such as indigenous metallurgy. Upon the West’s encounter with the African continent during the 1IR, millions of Africans were abducted from Africa to be slaves in the Americas which propelled 1IR in Britain due to the Atlantic triangular trade. The 1IR was thus a shift from agriculture to factories and was powered by steam and water. Africans during the 1IR were seen as slaves (commodities) rather than human beings. The 2IR (age of imperialism) saw the colonisation of African land and its resources, despite the abolition of slavery. The 2IR was no longer centred in one country (like Britain in the 1IR) but several countries formed a global industrial nexus and Africa was not part of this group. Electricity was the driving force behind the 2IR, and the factory became automatic. The global industrial nexus convened the Berlin Conference in 1884, which saw Africa being divided amongst European nations to avoid potential conflict amongst themselves as they dispossessed African land and exploited its natural resources. The 3IR also known as the “digital revolution,” “information age,” or the “network society” was propelled by the internet, personal

computers, and subsequently mobile phones. Through the internet network, the world became a global village also known as globalisation. The impact of globalisation on Africa is that Africa has no control of its media, finance and other industries. The three previous Industrial Revolutions exploited, marginalised, dispossessed, and subjugated Africa. The COVID-19 pandemic in the African continent further entrenches these deep structural socio-economic inequalities in Africa and between Africa and the global North. Social distancing, lockdowns, and work-from-home increased the use of digital technologies. Some even suggest that COVID-19 has fast-tracked the 4IR differences: it may continue to exploit Africa like the three previous Industrial Revolutions or Africa may harness its power to compete more effectively in the global economy. There are ethical implications when it comes to 4IR technologies such as AI which may have dire consequences for people without them even knowing. There needs to be an understanding that AI technology is not neutral, and mechanisms should be applied to design AI technologies that do not discriminate, dehumanize, or subjugate people.

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The following chapter 3 will critically discuss the influence of technology on the future of humanity. We have discussed technology and how it changed society and humanity's way of life, the advancement of technology at present has the potential to change or modify the human body (human enhancement), which raises questions about what it means to be human. There are many theories and suggestions on the future of humanity and the following chapter will discuss these within the concepts of eschatology, trans-humanism and post-humanism.

CHAPTER 3

BEING *UMUNTU* IN A TECHNOLOGICAL AGE

3.1 INTRODUCTION

The previous chapters have the discussed evolution of *Homo sapiens* from using stone tools and fire as survival technology to humans establishing complex societies through the advancement of technology. Essentially, technology has impacted (transformed) human society and changed how we live, work, play, and learn throughout the Industrial Revolution. Technology has advanced and its limits are not set, what does this mean for the future of humanity? Human evolution is a slow wheel, and current scientists are seeing the potential of emerging technologies not only to change society but to modify human DNA with technologies such as biotechnology and nanotechnology. Physically, through bionics to modify body parts or the whole body with AI-empowered robotics. The goal of these emerging technologies is human enhancement, to live longer without disease, to have better intellectual and physical capabilities, and ultimately, to transcend the body. There are varied perspectives when it comes to human enhancement; that it sounds like science fiction, is it already happening, or is it something that will happen in the distant future? These developments come with a series of ethical questions on the future of humanity which need to critically be discussed. The notion of the "human" or what it means to be human is dependent on who has the power to define it. In the previous chapter, it was alluded to how Africans were not considered human and subjected to slavery and colonisation. Throughout history, some were considered more human than others which justified the "others'" oppression, marginalisation, and discrimination. Biblically, for example, women and children were considered less human than men and were deemed as the property of men. The question "What does it mean to be human?" is not neutral and there is no consensus to answer it. It is therefore imperative to deconstruct what it means to be human and subsequently, post-human. In this chapter, we will discuss the future of humanity concerning technology from a secular and theological perspective (eschatology). We will discuss the notion of human and human enhancement through the perspective of transhumanism and posthumanism. The power of technology to alter nature and the human body poses another question,

“are we playing God or are we becoming God?” this will thus be critically discussed theologically.

3.2 TECHNOLOGY AND THE FUTURE OF HUMANITY

One of the most debated topics in the world is the future of humanity concerning emerging technologies. It is important to note that we do not have empirical evidence to make predictions although human endeavours are inherently future-orientated (Spier 2015). Ganzevoort (2020:50) states that the future may either be dystopian or utopian, either way, the most important thing is for humanity to be ethical and come up with appropriate solutions to the difficulties ahead. History is thus important to help us establish the trends of human progress and the possible scenarios of the future. We must consider that no trend is entirely constant, but some are observable (Spier, 2015). What does it mean to be human? The concept of humanity has long been examined by a diverse range of disciplines, frequently from an anthropocentric perspective: it has typically focused on identifying the qualities that make us fundamentally different from other animal species or machines (Baelo-Allue and Calvo-Pascual 2021:5). Although the most significant anthropological idea in the Christian tradition is the notion of the *imago Dei* (image of God), Veldsman encourages a theological interdisciplinary approach (Science and Theology) into the notion of human uniqueness (Veldsman 2020). According to Barfield (2019:1), the evolution of *Homo sapiens* several hundred thousand years ago is an excellent beginning point for a study about technologically advanced people in the twenty-first century. Humans have evolved in a way that makes our brains, particularly the cerebral cortex, more capable than those of other animals. The evolution of the *Homo sapiens* is what Charles Darwin called “natural selection” which has been the force behind evolution (Darwin 2003). *Homo sapiens* developed to effectively compete in their environment, and the process of evolution produced a sentient person with the capacity to live in that environment. Even if the technology we utilize now is far greater than before, in terms of our being, the evolutionary process has remained fixed since a few hundred thousand years ago, the human being has not evolved much (Barfield 2019). However, according to the Extensive Evolutionary Synthesis (EES) which offers an alternative approach to comprehending evolutionary activities, that is distinct from the idea that

has been a standard in evolutionary research since the 1930s (referred to as the modern synthesis). The EES is not intended to take the place of traditional thinking, but rather to provide an additional avenue to explore and stimulate evolutionary biology study (Extended Evolutionary Synthesis, 2023). According to Jablonka and Lamb (2020), there is thus not only genetic inheritance but EES includes epigenetic inheritance systems, soma-mediated transmission, behavioural inheritance through social learning, and symbolic inheritance systems. Due to the addition of new data and innovative ideas, the categorization system employed here is slightly different from the one used in previous publications such as Jablonka and Lamb (2014) and Lamm (2018). Genetic inheritance is based on variations of nucleic acids, especially DNA. It encompasses the processes of unwinding, transporting, replicating, repairing, transposition, mutating, inserting, deleting, amplifying, and degrading DNA sequences. During sexual reproduction, it includes the segregation, pairing, recombination, and monitoring of chromosomes during meiosis. It also applies when genomes undergo polyploidization, hybridization, and other changes (Jablonka and Lamb 2020). Epigenetics is the study of the interactions between genes and their products that construct the phenotype. It is responsible for cellular memory, allowing cells to maintain their identity. Epigenetic inheritance is the transmission of epigenetic variations that do not come from DNA base sequences. This has been found in all organisms it has been sought in and is a set of cellular processes leading to the inheritance of the activity of genes or protein structure (Jablonka and Lamb 2020). Soma-mediated transmission does not rely on gametic transmission and involves the passing of epigenetic variations through physiological reconstruction of the environment. This transmission is highly variable, making it hard to define it as a separate, evolved type of inheritance system, though each case may have been selected independently (Jablonka and Lamb 2020). Behavioural inheritance is a form of soma-mediated transmission that is based on learning. Social learning is a type of learning that is facilitated by social interactions, allowing animal traditions and cultural evolution to occur. It involves taking in information from the world or body and using it to develop a disposition to respond to future inputs (Jablonka and Lamb, 2020). Humans possess symbolic inheritance systems, which are communication and representation systems with conventional rules. These systems allow us to form an objective world and are built through social negotiation and cultural evolution. These systems are unique to humans, though some animals may have limited versions.

Literacy, morality, art, and science are products of cognitive development and teaching (Jablonka and Lamb 2020).

Biomedical research has likely contributed to some of recent history's most significant technical advancements. Over the past century, healthcare has advanced astronomically thanks to the ever-improving understanding of human biology and the resulting ability to cure and prevent disease. Furthermore, the ability to enhance abilities and capabilities for generations to come (Chan 2013). Humans are both technology's creators and consumers, and historically, human-made technology has been largely designed as tools that humans may use to investigate and transform their surroundings (Barfield 2019). The previous chapter has alluded to the Industrial Revolution and how human beings have used technology to change the way they live, work, learn, and play. Although technology has been created and used by humans for a very long time, it has only lately been implanted into the body to improve, enhance, or restore bodily processes, including those carried out by the brain (Barfield 2019).

Through emergent technologies, human beings will have the power for the first time in human history to have the ability to technologically fast-track human evolution (Van Niekerk 2020). Emergent technologies like exoskeletons, brain-controlled prosthetic limbs, and brain-implanted neuro-prosthetic devices are starting to produce technologically enhanced persons with capacities that go beyond what humans have acquired via the processes of evolution (Barfield 2019). According to Chan (2013:53) in terms of human evolution, what does the word "human enhancement" mean? A major worry concerning enhancement technologies is that they may endanger our species by undermining our humanity and turning us into beings who are not even human. Additionally, is it ethical to improve human beings, and if so, how far should we go? What will the development of enhancement technologies entail for humanity's future? and what would it mean to the notion of the human? (Chan 2013). A theological question would be, are we playing God? Some of the potentials of human enhancement are already happening or experimented while others still belong in science fiction (Miller and Wilsdon 2006).

Science fiction frequently depicts a technologically advanced human race. Future humans are envisioned to be able to recuperate from very serious wounds with ease

thanks to human-robotic interfaces, bionic body components, and cutting-edge medicine (EbioMedicine 2019). This sounds far-fetched but emergent technologies are developed to advance human enhancement. According to EbioMedicine (2019:1), any modification of the human body that is made naturally, artificially, or through technology to improve one's physical or mental skills is referred to as human enhancement. According to Miller and Wilsdon (2006:14), the definitions of enhancement differ as it is essentially about being better than our “normal” state. As human beings, we aspire to be better versions of ourselves in various ways, whether by education, employment, parenting, or abiding by moral or religious principles. Another way is by improving the physical appearance such as going to the gym, wearing make-up, fashion, or cosmetic surgery. According to Giubilini and Sanyal (2016:1), the phrase "human enhancement" in bioethics refers to any genetic, biological, or pharmacological intervention that aims to increase human inclinations, abilities, and well-being, even when there is no pathology that has to be addressed. Sun (2018:15) attests that since persons with disabilities frequently need prosthetic devices to conduct or move about in daily life, prostheses have historically served as a marker for thinking about the identities of these individuals. In the contemporary era, prosthetics have shifted from the function of supplementation to enhancement.

The following section will discuss the future of humanity from transhumanist and posthumanist perspectives.

3.3 TRANSHUMANISM AND POSTHUMANISM

According to Baelo-Allue and Calvo-Pascual (2021:5) the term “posthuman” is an umbrella term with various perspectives about the future of humanity or particularly, what follows after humanity as we understand it. According to Ferrando (2019:1), some of the posthuman perspectives are posthumanism, transhumanism, new materialism, anti-humanism, object-oriented ontology, posthumanities, and metahumanities. Ferrando (2019:27) states that the two most prominent perspectives are between transhumanism and posthumanism. This chapter will limit the focus on the posthuman in these two movements. The way the term "posthuman" has been used in posthumanist and transhumanist deliberations has led to many

misconceptions. Both philosophies emerged in the late 1980s and early 1990s but are derived from different schools of thought and different approaches. Transhumanism and posthumanism derive from the classical and enlightenment humanism schools of thought respectively. Transhumanism may be seen as radical humanism in seeking to conquer the biological limitations of humans through science and technology. Posthumanism, on the other hand, wants to debunk oppressive historical humanist paradigms on the notion of what it means to be human (Baelo-Allue and Calvo-Pascual (2021). They both share a critical perspective on the notion of the human which is seen as dynamic and everchanging rather than static (Ferrando 2018). They both consider the notion of the human in humanism as obsolete and want to progress beyond that biologically and philosophically, respectively (Baelo-Allue and Calvo-Pascual 2021). The idea of technogenesis is something that both transhumanism and posthumanism share, Ferrando (2019:39) quotes Katherine Hayles: "Technology is involved in a spiralling dynamic of coevolution with human development. This assumption, known as technogenesis, seems to me compelling and indeed virtually irrefutable" (2011:216). The intrinsic relationship between humans and technology is crucial in comprehending the posthuman from various perspectives such as anthropologically, paleontologically, and ontologically (Ferrando 2019).

The following subsections will critically discuss transhumanism and posthumanism in more detail.

3.3.1 Transhumanism

A scene from *Years and Years* (2019) a TV miniseries from BBC, shows a teenage girl having a conversation with her parents that she has been "uncomfortable…for a long time" and thinks she does not belong in her body. She has been researching this and thinks she is "trans." Her parents assure her that they still love her and will support her in her journey to change sex and will do their best to adjust to this reality. Her parents are astonished when she corrects them when she says: "I am not transexual, I am transhuman." Her parents look confused about what that means, she explains that she wants to get rid of her body and no longer wants to be flesh but she wants to "become digital." "What do you mean?" the father asks, she explains that soon, there will be clinics where you give consent and "they will take your brain and download it

into the cloud." The father further asks: "And your body?" she answers: "recycled…into the earth." The mother asks, "So, you want to kill yourself?" she answers: "I want to live forever as information, because that is what transhumans are, mum. Not male or female…better. Where I am going there is no life or death, there is only data. I will be data" (BBC 2019). This scene captures some of the ideas of transhumanism which Francis Fukuyama labelled as the "world's most dangerous idea" (Fukuyama 2004:42-43).

What is transhumanism? Lee (2019:4) states that the term "transhuman" was initially used in Dante's La Divina Commedia (Divine Comedy) in the fourteenth century to express the transformation of the human body into eternal flesh in eschatology. Ferrando (2019:29) states that Dante's usage of the word "trasumanar" (transhuman) which is "going beyond the human" in God's presence, is considerably different from how it is used today. Today, transhumanism's major goal is radical human enhancement through science and technology for human beings to live longer, better, and even forever. Transhumanism is thus the intermediate phase to eventually becoming post-human which is beyond what is human, perhaps, a new species (Fourie 2020). Sorgner (2022:1) asserts that transhumanism promotes humanity to overcome the limitations of their present existence and have control of evolution. This will raise the chances for human beings to have a happy life and avoid extinction.

The philosophical tradition of the Enlightenment, which swept throughout Europe in the eighteenth century, is where transhumanism's origins may be found. The transhumanist movement continues to uphold the Enlightenment principles but further radicalises them (Ferrando, 2019). It is important to mention that transhumanism is not homogeneous but there are various groups, and it is necessary to refer to it as transhumanism(s). There are, thus, libertarian transhumanism, democratic transhumanism, extropianism, and singularitarianism. Briefly, libertarian transhumanism promotes the free market as the best safeguard for the right to human advancement. Democratic Transhumanism advocates for equitable access to technology advances that could otherwise be restricted to specific socio-political classes and linked to economic power, incorporating racial and sexual politics. Extropianism can be better understood as a philosophy focused on the person and self-improvement (Ferrando 2019). Singulatarianism is based on the concept of

singularity by Ray Kurzweil in his book *The Singularity is Near: When Humans Transcend Biology* (2005). Kurzweil (2005) defines the singularity as

> "…a future period during which the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed. Although neither utopian nor dystopian, this epoch will transform the concepts that we rely on to give meaning to our lives, from our business models to the cycle of human life, including death itself." (p.24)

All these groups share the same objective, which is human enhancement. The primary online forum for discussing transhumanist ideas is named H+, whereby the "H" refers to "humanity" and the "+" (plus) denotes enhancement (Ferrando 2019; Humanity+, 2021).

Sorgner (2022:1) states that transhumanism gradually gained prominence through the writings of Julian Huxley (1887-1975) who used the term in his 1951 article *Knowledge, morality, and destiny*. Julian Huxley defined transhumanism as:

> "Such a broad philosophy might perhaps best be called, not Humanism, because that has certain unsatisfactory connotations, but Transhumanism. It is the idea of humanity attempting to overcome its limitations and to arrive at fuller fruition; it is the realization that both individual and social developments are processes of self-transformation." (p. 139)

Deretic and Sorgner (2016:16) mention that the paternal grandfather of Julian Huxley was Thomas Henry Huxley who was a staunch supporter of Charles Darwin. Julian Huxley, an evolutionary biologist and zoologist served as the British Eugenics Society's longstanding president and was the first general director of the United Nations Educational, Scientific and Cultural Organization (UNESCO). According to Tirosh-Samuelson (2011:10), Huxley viewed transhumanism as a positive approach that would resolve humanity's predicament by using arts, science, and technology to create a better world. This is in part because humanity as a species will evolve and will actively pursue its true purpose. The transhumanist movement was developed in the 1980s by philosopher Max More (real name Max O'Connor), who promoted the "principles of extropy" for advancing humankind. Humans are thus between the age of our animal origin and the age of our post-human future (Tirosh-Samuelson 2011).

Tirosh-Samuelson (2011) quotes Max More that the transition to the posthuman future will be accomplished through:

> "Genetic engineering, life-extending biosciences, intelligence intensifiers, smarter interfaces to swifter computers, neural-computer integration, worldwide data networks, virtual reality, intelligent agents, swift electronic communication, artificial intelligence, neuroscience, neural networks, artificial life, off-planet migration, and molecular nanotechnology." (p.11)

This transition to the post-human may create a different species that will no longer rely on natural selection (evolution) but move beyond the human. Is transhumanism in the distant future or is already happening? Lee (2019:5) argues that we are already transhuman on different levels, for instance, making use of vitamins, antibiotics, vaccinations, or birth control pills to be healthier or to modify our bodies is in some sense transhuman. Frodeman (2019) attests that:

> "We talk with—and see—people in real-time on the other side of the planet. We soar above continents in metal tubes traveling at 500 miles an hour. Our cyborg existence includes cell phones, eyeglasses, cosmetic surgery, Zoloft, knee replacements, Viagra, flush toilets, Skype, cochlear implants, the cloud, space flight, electricity, and ibuprofen. Our life expectancy has doubled since ancient times—at least in developed nations—and is half again more than it was in 1950. The issue, then, isn't whether we should embrace the transhumanist program; it seems we did that long ago. By the standards of 1850, much less of ancient times, we're transhuman." (p.39)

The Transhumanist Declaration, which was written by a group of transhumanist activists in the late 1990s, set forth several ethical stances on the use of and preparation for technological advancements. The World Transhumanist Association (WTA) was established by philosophers Nick Bostrom and David Pearce in 1998 to formalise transhumanism (Tirosh-Samuelson 2011). Authors from all over the world contributed to the original 1998 draft of the Transhumanist Declaration, including Doug Baily, Anders Sandberg, Gustavo Alves, Max More, Holger Wagner, Natasha Vita-More, Eugene Leitl, Bernie Staring, David Pearce, Bill Fantegrossi, den Otter, Ralf Fletcher, Tom Morrow, Alexander Chislenko, Lee Daniel Crocker, Darren Reynolds, Keith Elis, Thom Quinn, Mikhail Sverdlov, Arjen Kamphuis, Shane Spaulding, and Nick

Bostrom. Several writers and groups throughout the years have made changes to this Transhumanist Declaration. The Humanity+ Board approved it in March 2009 (Humanity+, 2021).

What are the critiques of transhumanism? Frodeman (2019:3) stipulates arguments that critique transhumanism based on socio-political and metaphysical aesthetics:

> 1. The social and political risks of transhumanism include political instability, caused by the development of a subset of humans with significantly greater powers; totalitarian government, where transhumanist advances become the means for manipulating and controlling the general population; and social and/or environmental disruption, where the transhumanist project leads to a catastrophic accident or falls into the hands of bad actors.
>
> 2. In terms of metaphysics and aesthetics, transhumanism suffers from a defective philosophical anthropology. It misunderstands our embodied nature and wrongly identifies our humanity with our computational power and our desire for pleasure. It defines progress in terms of greater technoscientific development rather than by the cultivation of greater compassion and solidarity. It has an impoverished notion of human fulfilment. Transhumanism offers technical innovation and ever more elaborate toys instead of what is needed: an alternative to a culture increasingly devoted to adolescent entertainment.
>
> 3. Rather than fulfilling our millennialist dreams, the more likely result of transhumanist efforts consists in the realization of the fears of Orwell or Huxley—or both. There are abundant signs of both dangers: on the one side, the development of a surveillance society, where our every movement and purchase are tracked; and on the other, the rise of a drugged culture dominated by disinformation, disengagement, and distraction.

5. Transhumanism highlights the dangers implicit within contemporary culture, where every challenge is treated as an occasion for more science and technology. Scientific and technological innovation breaks down established practices in every aspect of our lives, prompting the destruction of norms in politics, economics, and culture. The resulting problems raise the question of whether it's time to restrain the production of knowledge.

At the centre of these arguments is that transhumanists have an over-reliance on science and technology. There is more to life and being human than to solely focus all human capacity, aspirations, and endeavours on science and technology. Levin (2021:2) argues that the most important moral question should not be how we will react if or when extremely high-tech treatments for enhancement become accessible, but rather whether we should even devote significant resources to the purposeful pursuit of radical enhancement. The transhumanist concept that greater lifespan is a prerequisite for self-fulfilment is openly rejected by Bill McKibben. He contends that the average human lifetime is enough time to have a meaningful existence and that mortality increases the value of life. The human experience will be diluted by life extension and upgrades, which will also hinder character growth as people will avoid facing real challenges in life (McKibben 2003; Lilley 2013).

3.3.2 Posthumanism

Posthumanism is a philosophy which stems from post-modernism in the 1960s and 1970s that deals with the deconstruction of the human being. It emphasizes the reality that historically, not all human beings have been acknowledged as such: some were regarded as more human than others and others as sub-human (Ferrando 2018). The radical deconstruction of the "human" thus began as a philosophical and political movement in the late 1960s and evolved into an epistemic one in the 1990s (Ferrando 2019). Posthumanism emerged in the mid-1990s from critical debates in the humanities and social sciences (Wolfe 2010). Braidotti (2013:1) states that some of us are not able to state with any degree of assurance that we have always been human or that we just are that. Even now, some of us are not viewed as completely human, never mind at other points in Western social, political, and scientific history. Critical posthumanism should not be confused with transhumanist posthumanism. Transhumanist posthumanism is centred on radical technological human enhancement.

Wolfe (2018:647) labels it “humanist posthumanism” and regards it as problematic because it encourages human enhancement despite practical ethical questions. Critical posthumanism does not aim to eliminate embodiment, in contrast to transhumanists who aspire to transcend the human form. The human body is situated

in a setting that also includes machines, plants, and animals (Nayar, 2014). Critical posthumanism, therefore, according to Nayar (2014:19) criticises both human exceptionalism, which holds that people are unique beings, and human instrumentalism, which holds that humans have a right to rule over nature. This is not to say that critical posthumanism does not engage technology, but technology is included and not the sole focus as it is in transhumanism. Posthumanism, therefore, distances itself from transhumanism.

Kriman (2019:139) states that posthumanism is the intellectual offspring of M. Merleau-Ponty, M. Foucault, J. Derrida, G. Deleuze, F. Guattari, and others. Posthumanist philosophy is distinguished by its rejection of all hierarchies and binary opposition (human-non-human, male-female, black-white, culture-nature, humanism-antihumanism) (Braidotti 2017). For example, universal humanism follows the Eurocentric paradigm that emphasizes the dialectics and binary logic of self and otherness. The self (subject) is regarded as rational "superior", and otherness or "others" would imply those regarded as inferior or dehumanised (Braidotti 2013). Nayar (2014:24) specifies that the universal human centres the white male as the model and "others" (genders, ethnicities, differently abled) as inferior to the model universal human. In response to humanism, there was a resurgence of movements of postmodernity propelled by the historical "others" such as decolonization, anti-racism, women's rights, pro-environment, and anti-nuclear (Braidotti 2013). Braidotti (2013:1) asserts that we appear to be in the post-human dilemma after the postmodern, post-colonial, post-industrial, post-communist, and even the strongly argued post-feminist conditions. Braidotti (2013) further articulates the posthuman condition that:

> "…[it] introduces a qualitative shift in our thinking about what exactly is the basic unit of common reference for our species, our polity and our relationship to the other inhabitants of this planet. This issue raises serious questions as to the very structures of our shared identity – as humans – amidst the complexity of contemporary science, politics and international relations. Discourses and representations of the non-human, the inhuman, the antihuman, the inhumane and the posthuman proliferate and overlap in our globalized, technologically mediated societies." (p.1)

Posthumanism is thus a move beyond the humanism/antihumanism discourse on the notion of the human in the current context. The development of posthuman critical theory occurs where post-humanism and post-anthropocentrism converge. The former

puts out a philosophical critique of the Western humanist ideal of "man" as the purportedly all-encompassing standard, whilst the latter is based on the denial of species hierarchies and human exceptionalism (Braidotti 2018).

Nayar (2014:22-23) points out that posthumanism as critical humanism questioned:

- the myth of the human as the centre of the universe;
- the so-called 'autonomous rationality of the human mind;
- the agency of the individual in effecting changes in his life, and influencing history;
- the belief in the transparency of language as a medium of expression of individuality and experience;
- the exclusion of certain groups and races – Jews, blacks, women, slaves, untouchable castes – from the very category of the human

According to Ferrando (2018:439) as a post-humanism, posthumanism addresses the human subject without using any hierarchical schemata. The emergence of the intersectional critical perspectives of gender, race, class, sexual orientation, ability, and age, among others, has thoroughly proved that the human is not one but many, and it must thus be accounted for in numerous ways, based on the experience of corporeal human beings. Therefore, the humanist paradigm, which is built on a generalised and universalised perspective toward the human, is undermined since the human is not seen as one but as many – human(s) (Ferrando 2019).

According to Ferrando (2019:54), philosophical posthumanism can be defined in three aspects: post-humanism, post-anthropocentrism, and post-dualism. The first aspect is post-humanism which indicates an appreciation of the diversity of the human lived experience. The human is thus not a single notion or universal but is understood as many, pluralised as human(s) (Ferrando 2019). In other words, the plural in human(s) consists of race, gender, class, ethnicity, dis/ability, nationality, and so on, but subsequently deconstructed from its historical undertones (us/them). As humans, we are all different but still related. The perspective is that the notion of human(s) has no hierarchy based on differences. As a post-humanism, it must be conscious of its ancestry and fully explore what that might entail, recognizing the limitations and implications of the historical notion of the human, which should be understood not as static but as a process of becoming (Ferrando 2019).

According to Ferrando (2019:54), the second aspect is post-anthropocentrism which is defined as de-centring the human (*Anthropos*) regarding the non-human (animals, nature). It is the move away from the notion that humans are superior to other non-human species. In other words, speciesism, the discrimination based on different species. In human history, especially since the First Industrial Revolution, there has been a massive direct or indirect impact on nature by humans – known as the Anthropocene (Parikka 2018). Many species become extinct because of human action. Human action is thus responsible for what is called the "sixth mass extinction" for the unsustainable use of land, water, energy as well as climate change (World Wildlife Fund 2022). Post-anthropocentrism emphasises that every species is essential to the ecosystem and humans are not superior species but are interconnected with the environment and other species. Post-anthropocentrism thus advocates for a sustainable environmental praxis (Ferrando 2019).

The third aspect of philosophical posthumanism is post-dualism. According to Ferrando (2019:60), dualism is a dichotomy (two opposite sides) and not necessarily placed in a hierarchy, but throughout the history of Western thinking, the two sides (identities) have often been assigned a value in which one side would represent the positive and the other side the negative. This has been evident historically that the male is assigned a value of a positive and the female a negative; in the history of slavery, the white master (positive) and the African slave (negative); the "civilised" would be regarded as positive and "barbarians" as negative; culture (positive) and nature (negative); ability (positive) and disability (negative) and so forth. Post-dualism, therefore, affirms the human notion as open and deconstructs the dualistic forms of identity to overcome racism, sexism, ableism, and other forms of discrimination (Ferrando 2019).

What is the relevance of technology to philosophical posthumanism? It has already been indicated that posthumanism does not solely focus on technology. Technology is understood as a feature of human society, it is not seen as all-powerful, or something that should be feared or condemned (Ferrando 2019). Martin Heidegger's *The Question Concerning Technology* (1953 [English Translation 1977]) is an important resource for philosophical posthumanism on the ontological understanding of technology. In Heidegger's view, technology is neither good nor bad. Technology itself

is not the issue; rather, the issue is how humans handle it, or more specifically, the societal ignorance of the poetic (creative) power of technology (Ferrando 2019). Posthumanism does not overemphasise technology but sees it as co-development with humanity. Herbrechter (2018:228) states that the relationship between humans and technology or the significance of the development of technology for human and non-human progress needs to be redefined. According to Valera (2014:486), posthumanism views technology as an aspect of humanity and not necessarily as a means to overcome human limitations. A posthumanist critique of transhumanism on human enhancement to escape human limitations is that transhumanism further (re)inscribes what should be "normal" in promises of transcending "imperfect" bodies (race, gender, dis/ability, etc.) and its politics (Seltin 2009). Transhumanists would thus see technology as external and purport the body as a negative value and technology as a positive value. There is also a fear of the AI (robot) takeover, and that robots will be superior to human beings hence the need to transcend the human body as it is not enough according to transhumanists (Ferrando 2019). Ferrando (2019) articulates that human enhancement technologies:

> "…may be hard to access, since the resistance/acceptance/reconfiguration of the exclusivist delimitations of the human status by its outsiders might have left no official records behind." (p.83)

Humanity has not moved past the historical oppressions and discriminations, human enhancement or AI takeover may continue subjugation, and posthumanism as a praxis needs to prevent further dualism but advocate for co-existence and co-evolution (Ferrando 2019). Emergent technologies (human enhancement and digital information) have changed our collective view of what it means to be human (Braidotti 2017). In this information age, there are technological and digital identities such as the cyborg and our digital selves on the internet. Donna Haraway in her popular *A cyborg manifesto* originally written in 1985 (2006) defines a cyborg as:

> "…a cybernetic organism, a hybrid of machine and organism, a creature of social reality as well as a creature of fiction. Social reality is lived social relations, our most important political construction, a world-changing fiction." (p.117)

Alcaraz (2019:19) argues that Haraway's definition puts humans and cyborgs at odds with one another because there is nothing that is "human." Strong emphasis is placed on the differences between the two, highlighting how cyborgs are distinct from humans in terms of their bodies, ways of functioning and relating to one another, and even their politics and ethics. There are cyborgs in science fiction in movies such as *The Terminator* (1984) and *I, Robot* (2004). There are also cyborgs in the medical field where human is merged with machines. Ferrando (2019:21) states that bioethical debates around human cloning have begun, and the traditional conception process is being challenged by surrogate motherhood (OHCHR 2022). Humans and cyborgs are no longer distinguishable in terms of connotation. On the one hand, plastic surgery, high-tech prostheses, and electronic pacemakers have all become commonplace methods of bodily modification. On the other hand, an increasing number of individuals have undergone the pioneering experimentation of having Radio Frequency Identification (RFID) implanted under their skin (FDA, 2018; Ferrando 2019). Alcaraz (2019:29) argues that cyborgs and humans should not be understood in a dualistic way but as the evolution of the human into a cyborg as people who live with technology or are merged with technology. According to posthumanists, life is embodied, and may either be embodied physically or virtually (Ferrando 2019). As people are connecting to the internet or social networks and creating profiles on different platforms (Google, Facebook, Twitter, Instagram, TikTok, and LinkedIn) these are digital identities ourselves. The latest developments of the metaverse are the next generation of digital connection as in movies like *Ready Player One* (2018).

This section is concluded with a question, are we post-human? The answer depends on the perspective of the movements discussed in this section namely, transhumanism and posthumanism. According to transhumanists, we are not yet post-human, but we will be post-human in future as emerging technologies such as brain-computer-integration, mind uploading, AI, bionics, whole-body prosthetics and so on are at advanced stages of development. Transhumanism is the transcendence of human limitations such as ageing, disease, and even death to live longer and better. According to posthumanists, being post-human is a praxis which one can be in the present. It is the understanding that the historical notion of the human must be deconstructed and viewed as an open notion. Posthumanism should be understood as post-humanism, post-anthropocentrism, and post-dualism. Post-humanism is the

understanding that there is no single universal human, but humans are plural and diverse, nonetheless, their differences do not suggest a hierarchy of who is more or less human than the other. People should thus not be oppressed, enslaved, or discriminated against based on their differences. Post-anthropocentrism is the understanding that humans are not superior to non-human species but are an integral part of the ecology. Historically, humans have justified the destruction of the ecology or extinction of other species based on the belief that they are superior to other species. There is thus a need to practically advocate for a more sustainable environment as post-anthropocentrism. Post-dualism is the understanding that there should not be a value assigned to opposites (male/female, black/white, able/disabled) to denote who has more value than the other. There should be practical ways to dismantle the implications of dualism such as racism, sexism, ableism and so forth. Posthumanism is thus a praxis to deconstruct the notion of the human in the present and leading to the future.

The following section will discuss the religious perspective of the end of times and the fate of humanity, particularly, eschatology in the Christian tradition. Firstly, eschatology will be defined from the biblical perspective (Old Testament and New Testament). Secondly, it will be discussed from an African theological perspective vis-à-vis African Traditional Religion. Lastly, eschatology will be critically discussed about emergent technologies.

3.4 ESCHATOLOGY AND TECHNOLOGY

According to Moltmann (1996:7), the earliest manifestation of eschatology may be seen in the 17th-century "prophetic theology." In this instance, the Bible was no longer interpreted as a book of divine revelation. It was seen as a heavenly foretelling of the course of global history. The sovereignty of God and how that sovereignty was shown in history are the topics of the historical testimony found in the Old and New Testament texts. All prophecies have come true throughout the history of Israel, Christ, and the church, proving the inerrancy of the Bible. Therefore, in the end-time, the eschatological prophesies that have not yet come true will as well. What does the Old Testament tell us about eschatology? According to Middleton (2014:39), it is evident that God endows the human race with an earthly purpose when we look to the

beginning of the Bible. Genesis 1:26-28 depicts the divinely appointed humans the role of dominating the animal kingdom and the planet, whereas Genesis 2:15 describes the human task of nurturing and preserving the garden of Eden. According to Genesis 1:27, God created human beings, male and female (Adam and Eve) to look after the Garden of Eden on condition that they do not eat from “the tree of knowledge of good and evil” (Ladouceur 2013). Middleton (2014:43) states that the biblical concept of humans as the *imago Dei* (image of God) is combined in Genesis 1:26-28. Genesis 1 eventually foresees the emergence of all facets of culture, technology, and civilization due to the creation texts' emphasis on agriculture and animal husbandry, which are the cornerstones of human societal structure. Although Psalm 8:5-8 is not the beginning of the Bible, it states that God created humanity to reign over the creations of his hands and has placed the world under human supervision. All of these writings on creation depict a "missional" flow from God through humanity to the world. In other words, humans have a mandate from God to take care of the world on behalf of God (Middleton 2014). The biblical creation stories have made known the role of humans in the world, the question becomes, what went wrong? The literary genre of Eden in Genesis 2-3 is a narrative about God's orders, human rebellion, and the results of disobeying (Mettinger 2007). Middleton (2014:38) states that a good story may have good elements, but the plot is one of the most fundamental. A plot involves something going wrong and then being rectified. The biblical story's plot may be summed up as creation-fall-redemption (consummation is sometimes added). This shows a progression from God’s initial purposes for the world, but wrongdoing that hinders those purposes from being fulfilled to a restoration of the wrongdoing for God’s ultimate purposes to be fulfilled (Middleton 2014).

According to Brooks (2016) in the Lexham Bible Dictionary, eschatology derives from two Greek words ἔσχατος (last, end, or final) and λόγος (study of…) which means the study of the last things or end of times. Gerhard Sauter in his book *What Dare We Hope? Reconsidering Eschatology* (1999) argues that eschatology has no theological consensus as a concept and mentions that this doctrine was first introduced by Lutheran theologians in the 17th century to deliberate on the last things or *De Novissimis*. Sauter (1999) explores the multiple meanings and applications of the term "eschatology" in theological discourse. He examines two main definitions of eschatology: one emphasizing the doctrine of the last things, such as death,

resurrection, and judgment, while the other focuses on concepts of the future and an attitude of expectation (radical eschatology). He notes that the meanings of eschatology are not simply alternative possibilities but follow one another, reflecting different theological purposes and motives.

In this section, we will delve into the doctrine of the last things, eschatology includes death, the afterlife, judgement, heaven, and hell as well as the second coming of Jesus Christ. In the Old Testament, humanity lost its connection to God after the fall of Adam and Eve, and the rest of the Scripture is God's strategy for the restoration of humanity (Brooks 2016). Gowan (2000:1) argues that The Old Testament does not mention the end of the world, of time, or history, despite the literal translation of eschatology as "doctrine of the end" but it envisions the end of sin, human weaknesses, famine, and evil. The present-day reality is a recurring theme in the Old Testament view of the future. Nothing in essence is terrible because everything was created by God, yet sin has already irreparably damaged everything. The Scripture makes the radical triumph over evil the promise of transformation (Gowan 2002). However, the presence of promises of forgiveness and the re-creation of humanity in eschatological writings, which would prevent any further chances for forgiveness, suggests an underlying awareness of the insufficiency of the reparative powers of forgiveness in the here and now (Gowan 2002). Gowan (2002) further states that:

> "The transformation of human beings involves a re-creation of our presently distorted condition—a new heart; requires a gift from God which is more than simply a restoration to an uncorrupted state—a [new] spirit; and calls for the establishment of a relationship between God and humanity on different grounds from those of the present—a new covenant. Essential background for dealing with these texts will thus be found in Israelite anthropology and the covenant traditions." (p.69)

Carroll (2000:420) argues that the language of eschatological texts is expressive and has an educational component as it foretells the conclusion of a historical epoch or a particular challenge. Therefore, the "rhetoric of eschatology" makes use of pictures and metaphors to maintain hope despite the uncertainties of historical life as well as to strengthen moral arguments or preserve faithfulness to God amid suffering. According to Brooks (2016), the Old Testament has two perspectives of eschatology, (a) pre-exilic, and (b) post-exilic. The pre-exilic view of eschatology is centred on the

idea of שְׁאוֹל (she'ol) which is the Old Testament's oldest description of the afterlife, it paints a picture of a universal place where everyone who dies goes, regardless of their decisions and actions in life (Brooks 2016). Carroll (2000:420) attests that pre-exilic prophets often predicted future catastrophe for the nation and regarded it as God's wrath for a sinful nation. A more in-depth understanding of the afterlife is presented in post-exilic Old Testament writings. The afterlife and resurrection in God's presence are presented as abstract concepts. The prophets envisaged a strong relationship with God beyond death, and some made references to resurrection, but they were unsure of its significance or scope (Brooks 2016). Carroll (2000:420) attests that post-exilic prophets envisioned a time when God would liberate and rebuild the nation from adversity but also wondered when it would happen.

In the Bible, the prominent religious groups are the Sadducees, Pharisees, and Essenes. Sadducees did not believe in an afterlife, as there was no mention of it in the Torah. Instead, their focus was on the ritualistic practices associated with the Temple. The Pharisees maintained that an afterlife was real and that God would grant rewards and punishments to the righteous and wicked respectively in an afterlife. Additionally, they had faith in a messiah who would bring about a period of peace. The Essenes believed that upon death, the body is temporary and will perish, while the soul is immortal and indestructible. Those who lived virtuously would experience a pleasant afterlife (Jewish Virtual Library 2023).

The New Testament perspective of eschatology is both individual and corporate, which gives a detailed account of the everlasting fate of believers and nonbelievers. The kingdom of God that was central to the ministry of Jesus Christ will arrive and complete the restoration of God’s people (Brooks 2016). Ladd (1974:1) argues that in New Testament research, there is a growing understanding that the Kingdom of God is, in some ways, both now and in the future. There are, however, still ongoing debates about apocalyptic ideas in Jesus’ teachings and the link between the current and future parts of the Kingdom. Middleton (2014:131) states that the resurrection of the body, which includes both Jesus' rise three days after his crucifixion and the anticipated resurrection of believers at the end of the world, is one of the defining teachings of the Christian faith. According to Carroll (2000:421), the primary motivation provided by the Gospel of Mark and Matthew's eschatology is to live a life marked by unwavering

devotion to God and generous love towards one another. Mark and Matthew, to a larger extent, assume that the eschatology will take longer than expected. The Gospel of Luke, however, is agreement that eschatology will happen in the future but proclaims that Jesus Christ will return soon. The Gospel of John on the other hand renders “Jesus is the eschaton” as eschatology is not only in the future but the present as well. The fate of those who reject or believe in Jesus is in the here and now. Eschatology, for John, is thus reliant on one’s relationship with Jesus Christ (Carroll 2000). According to Brooks (2016), Paul’s epistles expand both individual and corporate eschatology as he refers to believers who have passed on but awaiting the coming of Jesus Christ as “fallen asleep.” Although Jesus Christ has not yet arrived, the kingdom of God is present in the hearts of the believers. The conclusion of the book of Revelations occurs when John describes “his vision of the new Jerusalem” that resembles the garden of Eden and God residing among humans (Brooks 2016).

There are many perspectives and debates on eschatology but not limited to biblical, theological, philosophical, religious, and cultural, and all with distinct perspectives (i.e., denominations, or theologies) that vary (Wells 2008). These perspectives and debates cannot be covered in the scope of this section. However, it would be essential to reflect on eschatology contextually in Africa via African Theology vis-à-vis African Traditional Religion.

3.4.1 African eschatology

According to Amevenku and Boaheng (2021:1-2), every theology is shaped by its context. Thus, the existential circumstances of the African continent must inform an African eschatology. In this sense, it is necessary to translate biblical passages on eschatology into the context of Africa considering their original audience's understanding of them. Thus, to meet the needs of the African continent, African Christian eschatology includes contextualizing Biblical eschatology. As a result, African culture becomes a crucial collaborator in the theologizing process. Aderibigbe (2020:16-17) states that one of the foundational elements of African culture is religion, which is deeply ingrained in the way of life of the people both physical and spiritual. The African traditional religion is the one that most accurately reflects this African worldview. Before the arrival of other religious traditions, especially Christianity and

Islam, it was the native religion of Africa. Lugira (1999:118-119) notes that the term "indigenous religions of Africa" refers to faiths with African roots from diverse ethnicities in Africa. African religion is discussed both in the singular and the plural forms. In terms of the religion's ethos, the singular symbolizes the unity of all African religions. Regarding how many African ethnic groups express their respective religions, African religion may also be represented in the plural.

John Mbiti's *Introduction to African Religion* (1975) argues that African Religion was subjected to many misconceptions and derogatory labels by Euro-American writers that it was referred to as ancestor worship, superstition, animism or paganism, magic, or fetishism. However, there is an increase in African "insider" scholars concentrating on African Traditional Religion today who have continued to debunk earlier misconceptions and bring to light fundamental principles, ideas, and developments (Aderibigbe 2022). What are the elements of African Traditional Religion? According to Aderibigbe (2022:32), there are five major beliefs in African Traditional Religion in a hierarchy, belief in the Supreme Being, the divinities, spirits, ancestors, magic, and medicine. Briefly, Africans believe in the Supreme Being as the creator of all that exists in the universe whether visible or invisible (Aderibigbe 2022). Each ethnic group has a name for God, but most scholars prefer to use the term Supreme Being, as the source of African life (Ogungbemi 2022). Divinities are created by the Supreme Being to do specific duties such as mediators between the Supreme Being and human beings (an earthly example of king and chief). There are three types of divinities (a) ancient divinities that were created since the very beginning of the universe, (b) deified ancestors who were once human beings who accomplished great deeds and were deified when they passed away, and (c) divinities that manifest themselves as natural phenomena such as nature (rivers, trees, mountains, etc.) or objects regarded as sacred (Aderibigbe 2022). A spirit is typically thought of as a ghostly entity that temporarily inhabits tangible objects anywhere on Earth as they are immaterial. While humans respect, venerate, and communicate with divinities and ancestors, spirits are feared, as they are associated with evil deeds that are harmful to human progress (Aderibigbe 2022). Africans have a fundamental belief in ancestors, that the dead continue living in the spiritual realm. They are regarded as the living-dead (spiritually) and continue being in communion with the living in the physical world. Ancestor veneration should not be confused with the worship of ancestors (Aderibigbe 2022).

Magic is defined as an attempt by humans to access and control supernatural forces for their use and eventual advantage. The manipulation of supernatural forces may be used for good or bad. Medicine is the ability to cure or prevent illnesses and diseases using natural and spiritual means (Aderibigbe 2022).

How does the worldview of African Traditional Religion understand eschatology? Scholars of several world religions, including Judaism, Christianity, Islam, Zoroastrianism, and Hinduism, have given the topic of eschatology substantial consideration. However, there is disagreement among academics regarding eschatology in African Traditional Religion. Some scholars vehemently reject eschatology and others do not completely reject it but overlook its significance (Aderibigde 2020). To understand African eschatology, we have to understand the concept of time and space from an African perspective. According to Mbiti (1975:34) in terms of both space and time, the cosmos is thought to be infinite. Since the cosmos has no recognized rim or edge, no one can grasp it. There is no end to the cosmos, just as there is no end to the earth. African conceptions of time are primarily concerned with the present and the past, and they do not say much about the future, which is presumed to continue indefinitely. Mbiti's conception of time has been critiqued by later African scholars, but the theory's fundamental principle is still relevant (Mbuvi 2009; Mudimbe and Kilonzo 2012).

Mbiti (1975) explains the potential time and actual time in African traditional thought:

> "…time is a two-dimensional phenomenon, with a long past, a present and virtually no future. The linear concept of time in Western thought, with an indefinite past, present and infinite future, is practically foreign to African thinking. The future is virtually absent because events which lie in it have not taken place, they have not been realized and cannot, therefore, constitute time. If, however, future events are certain to occur, or if they fall within the inevitable rhythm of nature, they at best constitute only potential time, not actual time. It has already been alluded that the concept of death in African Traditional Religion is not the end but a continuation of living in the spiritual realm." (p.21-22)

According to Mbuvi (2009:665), in the African worldview, time is not linear but rather moves in cycles that are in part controlled by the cycles of nature. Even if some

aspects of African time seem to be linear (from birth, initiation, marriage, old age, to death), eschatological thinking of the future in African thought was introduced by Judeo-Christianity. The concept of time in Western (Judeo-Christianity) is a "linear projectile headed toward a *telos* (death and judgement)," which is different to an African conception that is infinitely spiral (Mbuvi 2009:665). Aderibigbe (2020:21) mentions the various perspectives of eschatology in African Traditional Religions that, (a) human life is not headed towards the end of "last things," (b) there are no well-developed concepts of afterlife, judgement, or reincarnation in many African ethnicities to support eschatology, (c) eschatology is simply an "import" from Christianity and Islam which may not be significant in African life, and (d) eschatology may need to be further studied from an African perspective about the concept of time.

Although resurrection or the "last things" are not within the scope of African beliefs, Africans, however, believe in the afterlife. This belief stems from the understanding that there is a physical world and a spiritual world; human beings are also composed of the flesh (physical) and the spirit (immaterial). Death is when the spirit departs the physical body to the spiritual world to live on as an immortal spirit or ancestor. This is the circle of life for Africans that continues endlessly. Aderibigbe (2020:25) argues that not everyone will have "citizenship" in the spiritual world after death, but there are conditions such as having lived an honourable life while on earth.

3.4.2 Eschatology and Emergent Technologies

What does eschatology have concerning emergent technologies in the 21st century? Gowan (2000:121) makes an important assertion, that, over the ages, the fundamental doctrines of the Old and New Testaments have been mixed with a wide range of ideas and sometimes perverted to the point that their new forms are hardly consistent with their origins. Therefore, to identify how it may be most true to its origins, each generation of believers needs to evaluate its sources. Post-Christian ideologies such as transhumanism hold an eschatological view that the current dysfunctional world will be replaced by a technologically perfect world (Fourie 2020). Noble (1997:11) argues that religion and technology are not complimentary nor a contradiction but should be understood as having evolved together historically and merged into one. This is in part because technology acts as both a business and largely a religious pursuit. Stahl

(1999:18) states that technology is no longer about what we do, it has become who we are and intrinsic to our identity. This makes technology an implicit religion. Tirosh-Samuelson and Hurlbut (2016:1) agree that "humans are tool-making animals: making and using tools are expressions of being human." However, technology is no longer about tools and machines but has progressed to a cultural phenomenon. Human values, standards, and ideals are expressed and encoded via technologies. They represent both idealized representations of human existence as it is and visions for what it could be (Tirosh-Samuelson and Hurlbut 2016). On the notion of what the future might be like technology and religion have different perspectives. For instance, proponents of the singularity, mention that soon artificial intelligence will rule the world. Therefore, for humans to survive as a species, they will transmit their consciousness to machines and merge with machines (Fourie 2020). Noble (1997:29) makes a statement that "technology now became at the same time eschatology." Fourie (2020:32) states that proponents of the singularity make use of Christian themes such as eschatology, but technology has taken the role of trust in God. There is thus a need to reflect theologically on the implications of technological eschatology with Christian eschatology (Fourie 2020). Cole-Turner (2016:26) argues that the best way this must be approached is for Christian theology to move beyond being negative, dismissive, outraged, or unproductive about techno-eschatology, and to engage critically on it.

Cole-Turner (2016:26) states that the concept of God has helped us to revive our hopes centuries ago. However, when hopes are aroused, we invent. Technologies, not Gods, satisfy our needs and desires. Secularists even claim that hope in God only delays our evolutionary progress and that belief in God enslaves us rather than frees us. Technology is advancing towards human enhancement to make us better humans (physically, intellectually, psychologically) and increase our mortality. Eventually, human beings becoming one with technology will make us live forever beyond human fragility and boundaries. Therefore, Christian eschatology may no longer be significant because of the power of technology (Cole-Turner 2016). However, according to Christians, humans are mortal beings on earth temporarily, although that does not take away the fear of death (Waters 2011). In Christianity, believers rely on the will of God rather than themselves or technology.

According to Amevenku and Boaheng (2021:98) due to technology, it is difficult to define death. It may be defined physically as the final breath, pulse, and mental

activity, but technology has redefined it with the introduction of life-support to keep a person alive artificially. Death can be postponed and, eventually, technologically eradicated. In contrast, Christians believe that life is in God's hands and there needs to be trust in God. Eschatologically, Christians believe that Christ defeated death on the cross and resurrected, therefore, Christians will also conquer death when they are resurrected (Waters 2011; Fourie 2020).

The following section critically discusses the notion of God concerning emergent technologies.

3.5 EMERGENT TECHNOLOGIES: ARE WE PLAYING GOD OR BECOMING GOD?

The rapid growth and power of technology have posed questions if we are becoming God. Historically, many things have been attributed to God, but the same attributes can be achieved by technology by humans to a certain extent (Harari 2016). God in Christianity is known as the creator and ruler of the heavens and earth; God is Holy, omnipotent (all-powerful), omnipresent (present everywhere), and omniscient (all-knowing) (Castillo 2021). Holmes (2007:69) argues that the nature of God is beyond human and intellectual comprehension. Grudem (2020:218) categorises the attributes of God as "incommunicable" and "communicable," there are attributes that God shares with humans in various ways (communicable) and attributes that God does not share (incommunicable). Therefore, we may not know everything there is to know about God.

God has given life to human beings, nature, and animals on earth. Life, however, is limited. The fragility of human beings to become sick, injured, get old, and eventually die is a part of life. Inevitably, humans die either by natural or unnatural causes (Matheson 2017). Our bodies have limited time and humans' approach to their death vary; some accept it effortlessly, some harbour suicidal thoughts or eagerly anticipate dying, some find it hard to accept death, others naturally or spontaneously accept it, and some come to terms with death from a religious outlook (Boudin 2021).

Mullins (2021:99) states that the assurance that one will be saved from pain and death is a key component of the Christian notion of salvation. The doctrine of salvation in Christianity is known as soteriology. Ryrie (1999) defines soteriology broadly as:

> "… the doctrine of salvation, must be the grandest theme in the Scriptures. It embraces all of time as well as eternity past and future. It relates in one way or another to all of mankind, without exception. It even has ramifications in the sphere of the angels. It is the theme of both the Old and New Testaments. It is personal, national, and cosmic. And it centres on the greatest Person, our Lord Jesus Christ." (p.453)

Salvation is the act of God to save humanity and the cosmos from death and destruction. Jan G. van der Watt edited the book *Salvation in the New Testament: Perspectives on Soteriology* (2005) which indicates that there are varying perspectives of soteriology in New Testament studies but when it is located from the "master story" it is summarised as follows:

> "There seems to be general agreement on the anthropological perspective that humans are in trouble in their relation to God. People are separated from God and a relationship between them is absent. They cannot restore the relationship on their own, because they are not in a position to do that…God, however, comes into action and opens real possibilities for the restoration of this relationship. His motivation for doing this, for instance, is described in terms of grace or love." (p.519-520)

The premise is that humans cannot save themselves and reconcile themselves with God but need God for salvation. Humans cannot eradicate sin and death by themselves. Jesus Christ is therefore the agent of salvation.

Humans have always had a desire to live without getting sick or injured, and to live longer or even immortal. There are different perspectives when it comes to immortality. In world religions, generally, immortality is when we physically die, but the soul lives on (Matheson 2017). Technologically, human desires are becoming possible as movements such as transhumanism are dedicating research to how to fulfil these human desires of perfect bodies and immortality (Ferrando 2019). It has already been established in the previous sections that transhumanism aspires to a life that is prolonged differently, one that is free from illness and pain, and one that has enhanced cognitive powers to escape the fatalities and limitations of humanity (Fourie 2020).

Transhumanist views stimulate the question: are we God or becoming God? The “we” in this question does not signify all of humanity but is an inquiry into the direction that the advancement of technology is taking regarding radical human enhancement. The three categories which give a broad understanding of transhumanism are super longevity, superintelligence, and super well-being are promoted by British transhumanist David Pearce (Ross 2020). Superlongevity focuses on radical life extension to achieve physical immortality. Mercer and Trothen (2021:22) mention some of the possible technologies for radical enhancement such as genetic engineering and therapy (i.e., CRISPR) which strives to identify and manipulate the genes that cause ageing and other diseases. Another aspect is “designer babies” which is genetic engineering in the embryo to enhance a baby to have specific traits and elimination of diseases before they are born. Superintelligence focuses on the use of computers to develop intelligence that is on par with, then surpasses, that of humans (Ross 2020). Think of robots, artificial intelligence and supercomputers. Super well-being focuses on using pharmaceuticals and genetic engineering to maintain a constant state of subjective happiness above all else (Ross 2020). This is for the elimination of pain and suffering from unpleasant experiences. It may take a couple of decades for radical human enhancement to be functional but in the meantime, there are technologies such as cryonics that can preserve the human body indefinitely or bridge a gap between death and the future until technologies are more advanced (Mercer and Trothen 2021). The three supers of transhumanism (super longevity, superintelligence, and super well-being) suggest “playing God” (Peters 2018).

According to Fuller and Lipinska (2014:46), the term "theomimesis" (which means "God-playing" in Greek) refers to our desire to "enter into the mind of God," which is to say, "play God," with the former word still having resonance in physics and the latter in biology. In transhumanism, the aspiration for radical human enhancement is regarded as “playing God.” Playing God contrasts with *imago Dei*. The prohibition against playing God does not frighten transhumanists. The transhumanists among us intend to push human development to its next step, toward the emergence of a posthuman species, by combining genetic engineering and digital improvement of human intelligence (Peters 2018).

According to Cole-Turner (2011:193), transhumanism poses various challenges and questions to Christian Theology. What position should Christians take on radical

human enhancement technologies? How should salvation be understood in the context of emergent technologies? Some Christians may inherently reject radical human enhancement, some may accept certain aspects, and others may figure out how to incorporate transhumanist ideals with Christianity. According to Fourie (2020:28), transhumanism ideals are a contradiction to Christianity because in Christianity humans are time-bound, they can die. To receive forgiveness of sin through Jesus Christ and to one day rise from the dead is to experience genuine humanity. As a result, believers in Jesus Christ are evolving into their true selves. Transhumanism is humans taking matters into their own hands and deciding their fates through technology while in Christianity eternal life is through Jesus Christ. McKenny (2011:188) argues against transhumanism that human existence in all its emptiness, vulnerability, and limitations is the life that God makes ideal for a relationship with God. It is, therefore, consequently erroneous to strive to technologically transcend human limitations. Tirosh-Samuelson (2012) on the other hand regards transhumanism as a secularist faith

LaBerge (2019:775) argues that Christians should not just reject transhumanism but engage it critically. LaBerge admits that Christianity and transhumanism have different ideals, but it should be noted that as Christians are not the same by definition, it is also true for transhumanists. Technology is not neutral and may be used for good or evil. No matter how advanced technology may become, would it be able to identify and eliminate sin from the human genome? God will therefore always be relevant. Ultimately, Christians in conversation with transhumanism should engage without compromising the fundamental beliefs of the Christian faith (LaBerge 2019).

There is a movement of Christian transhumanists such as the Christian Transhumanist Association formed in 2014 where Micah Redding is the first executive director and the academic advisory council consist of majority theologians Ron Cole-Turner, Calvin Mercer, Jeanine Thweatt, and Ted Peters (Christian Transhumanist Association 2022).

The Christian Transhumanist Association affirm transhumanism from a Christian perspective.

One of the affirmations states that:

> "We believe that the intentional use of technology, coupled with following Christ, can empower us to grow into our identity as humans made in the image of God." (Christian Transhumanist Association 2022)

The mission of the Christian Transhumanist Association (2022) is three-fold: Theological Mission, Faith-renewing mission, and Technological mission. On their technological mission, they affirm, engage, and support the fast-tracking of super-longevity, super-humanity, super-intelligence, and super-ecology through the ideals of Christianity (Christian Transhumanist Association 2022). According to Redding (2019:777), today's Christian Transhumanists uphold this fundamental principle of early Christianity and apply that viewpoint to the opportunities and difficulties that lie ahead; addressing the most recent issues in science, technology, and philosophy proactively and beneficially. Peters (2019:804) concurs that Christians should be on board the transhumanism train but should be sceptical when transhumanists brag about being messiahs through technology or achieving posthuman perfection. Christians should be advocates of technological innovation to make the world a better place and God should remain be centre of transformation through the Holy Spirit. In a TV interview when Micah Redding is asked if transhumanist ideals mean we are playing God or becoming God? he responds,

> "I think that is an unfortunate factor of this being a largely secular conversation is that the language for dealing with this in a faith-based…religious or theological way just is not there. So, what you get from a lot of secular people is this kind of language 'Oh we're going to become God'…and so I think it is important for us as people of faith to bring into this conversation the ability to frame this…in good theological language and good theological terms…So, no, I do not…think that this is us becoming God." News Channel 5 (2018)

Transhumanism is an ongoing debate in the secular as well as religious circles. There are thus varying perspectives on but there needs to be further critical discussion from various theological perspectives.

3.6 CONCLUSION

This chapter has critically discussed the current debates on emergent technologies and the future of humanity from secular and religious perspectives. This chapter also deconstructs what it means to be human as throughout history, some were considered more human than others, or others not human at all. Essentially, what it means to be a human in the context of emergent technologies. Technologies in the past have transformed society and emergent technologies are set to enhance the human to live longer (super-longevity), be super-intelligent, overall better, and eventually transcend our natural limitations. This chapter discusses the implications of these emergent technologies and the future of humanity. We cannot predict the future but the development of technology is future-oriented. We can observe patterns in history and how the future might look like, but it may not be as predictable. When teens were interviewed in 1966 about how they thought life would be like in the year 2000, some said machines would replace humans, robots would do everything and only people with high IQs would have jobs (BBC Archive 2021). However, technology in the year 2000 did improve but it was not as advanced as predicted. When speaking of human enhancement, we must first understand what a human is. Anthropologically, humans are *Homo sapiens* and the imago Dei (image of God) from a Christian perspective. We should however be open-minded and engage in the notion of the human in an interdisciplinary way. According to Charles Darwin, the evolution of the *Homo sapiens* was driven by a very slow process of natural selection. Therefore, the evolutionary process has remained static in its current state for hundreds of thousands of years. Evolutionary research post-Darwin is found in the alternative approach of the extensive evolutionary synthesis (EES). It encompasses genetic inheritance based on DNA and epigenetic inheritance through cellular processes, as well as soma-mediated transmission, behavioural inheritance via social learning, and symbolic inheritance systems. Emergent technologies will give humans the power to fast-track the human evolutionary process for the first time in human history. This comes with many ethical questions it is our place to do so or we are playing God or becoming God? The future of humanity was discussed under the umbrella term "post-human." There are many perspectives on the post-human, but this chapter focused on the two prominent and mostly confused movements of transhumanism and posthumanism. Transhumanism is a movement that wants to transcend human limitations through technology and is regarded as radical humanism. Posthumanism is a movement that seeks to

deconstruct the notion of the human that is deemed as oppressive in humanism. Both these movements agree that the notion of the human is ever-changing rather than static. Therefore, the notion of the human in both these movements considers humanism as obsolete and wants to move beyond that biologically and philosophically respectively. Technology is also what these two movements have in common as an intrinsic part of humanity. Transhumanism wants to technologically transcend human limitations such as ageing, disease, and even death. According to transhumanism, we are not yet post-human but will be in future as emergent technologies such as mind uploading, AI, brain-computer-integration, bionics, and whole-body prosthetics are not yet at advanced stages of development. According to philosophical posthumanism, being post-human should be understood in three ways; post-humanism (the notion of humans is plural and diverse and there is no hierarchy or universal human); post-anthropocentrism (humans are not superior to non-human species); post-dualism (there should not be a value assigned to opposites to denote who has more value than another). We can be post-human in the present as posthumanism is a praxis. In the Christian tradition, the future of humanity is discussed within the doctrine of eschatology. This chapter discusses eschatology from a biblical perspective as well as an African theological perspective. Eschatology is the doctrine of the last things or the end of times. In the Old Testament, humanity lost its connection with God after the fall of Adam and Eve, and the scriptures reveal God's strategy for the restoration of humanity. Eschatology in the Old Testament is the end of sin, human weaknesses, famine, and evil. Humanity will thus be transformed in their hearts and minds. In the New Testament, the kingdom of God is central to the ministry of Jesus Christ and will arrive and complete the restoration of God's people. The understanding is that eschatology is both now and in the future. According to African Theology, eschatology from an African perspective requires the understanding of time and space in African culture. African culture upholds that the cosmos is never-ending, and time is not linear but infinitely cyclical. African culture does not think about the future as it is unpredictable and focuses on the long past and present. Death in African culture is not the end but spirit continues to live on in another dimension. Eschatology in African Theology is still an ongoing debate. What does eschatology have concerning emergent technologies in the 21st century? Technology and religion have different perspectives, transhumanist create their eschatology by transcending the body via technology, and Christianity waits for eschatology in the second coming of Jesus

Christ. Transhumanists do not see the relevance of God and eschatology from a Christian perspective. Christians on the other hand rely on the will of God and not themselves or technology. There is thus a need to theologically debate the implications of technology and eschatology. Are transhumanists playing God or becoming God? God in Christianity is known as the creator of the heavens and the earth. The human language is not sufficient to define or describe God as God is incomprehensible in the human mind. There are attributes of God we know such as Holy, omnipotent, omnipresent, and omniscient, but there are also attributes of God that we do not know. God created human beings, but the human life is fragile and limited. Human beings get sick, injured, get old, and eventually die from natural or unnatural causes. The Christian notion of soteriology (salvation) is that God will save humanity and the cosmos from death and destruction. Humans according to Christianity cannot save themselves and reconcile themselves with God. Humans cannot eradicate sin and death, but Jesus Christ is the agent of salvation. Transhumanist aspirations are a radical human enhancement for super longevity, superintelligence, and super well-being. Essentially, it is to transcend the human limitations of the body and death. Christian eschatology according to transhumanists is irrelevant. There are many perspectives of radical human enhancement within Christianity as some reject it, others accept certain aspects, and some want to figure out how to incorporate transhumanism and Christianity. These debates are ongoing and require further critical theological reflections.

The next chapter 4 will discuss developments of current ethics/policies on emergent technologies in the global context. Chapter 4 will discuss the role of policies in regulating AI and emergent technologies.

CHAPTER 4

GLOBAL LANDSCAPE OF AI ETHICS

4.1 INTRODUCTION

The previous chapter has critically discussed the future of humanity vis-à-vis technology as well as the perspective of eschatology from biblical and African Christian perspectives. The varying perspectives of post-humanism have also been discussed, on the one hand, transhumanism is a radical human enhancement and on the other, hand philosophical posthumanism debunks the notion of what it means to humans away from the construct that other humans are less than others human beings. Although it is important to discuss the future, it is not certain and is speculative. It is thus essential to focus on the current state of emerging technologies such as AI with examples of how it has been used by technological companies as well as various governments in the world. Chapter 2 has alluded to the ethical considerations of emerging technologies such as job losses due to automation, how the use of AI may perpetuate algorithmic bias and discrimination, and evasion of accountability. Much of the emergent technologies have minimal to no regulation as policy is catching up to the impact of emergent technology that is already far ahead. There are thus concerns about transparency, fairness, privacy, justice, and accountability regarding AI. In response to these technological concerns, there has been a plethora of regulations, policies, statements, ethical codes, and other proposed documents from the public sector (governments/countries and supranational unions [i.e. European Union, African Union]) and private corporations (i.e., Google, Microsoft, IBM) as well as non-governmental organisations (NGOs) to address AI challenges. These documents serve different purposes with similarities and differences. This chapter will discuss the current AI ethics/policies in the public sector globally, major tech companies developing AI and their ethical stance, limitations of AI, and critically discuss self-regulation or external regulation of tech companies.

4.2 THE EMERGENCE OF AI ETHICS

It has already been alluded to in Chapter 2 that AI has been around since the 50s but due to the lack of computer power, enthusiasm, and funding it did not produce much breakthrough but only gained traction in recent years (Russel and Norvig 1995).

According to Calo (2017:402) practical advances in machine learning, a crucial area of AI, have been made possible by a significant rise in computer capacity and access to big data. These advances highlight the potential good and bad of AI of which policymakers have been taking notice. While AI critics express worries about a variety of ethical, legal, and societal issues, AI supporters point out the possibility of significant economic development and social benefits. Algorithmic prejudice, disproportionate harm to disadvantaged communities, lack of accountability, transparency, and technical "superintelligence" are a few of these risks (Schiff et al. 2020).

Schiff et al. (2020:153) argue that it is crucial to address the subject of global AI governance intelligently and methodically, even while the increase in interest and knowledge may present significant opportunities for AI stakeholders. Diverse stakeholders disagree on the types and degree of governance that are acceptable for AI, which includes various technologies that cut across many industries. Some people support industry-wide or corporate self-regulation. They typically claim that governments lack the adaptability or knowledge necessary to regulate successfully or that hasty regulation will impede competition and innovation.

4.2.1 Why there is a need for AI ethics?

A document on AI ethics may be created by an organisation for several different reasons. It can be challenging to ascertain the motives for any specific document and an organisation may be driven by various factors (Schiff et al. 2020). Given AI's potent revolutionary potential and significant societal impacts, there has been much discussion regarding the values and principles that should direct its creation and application. Concerns about how AI can threaten human workers' jobs, be abused by evildoers, evade accountability, or unintentionally spread bias and erode fairness have dominated recent scientific literature and media coverage (Jobin et al. 2019). Furthermore, the subject of ethical AI has been covered in several studies, particularly in meta-assessments or about systemic risks and unanticipated negative outcomes such as algorithmic bias or discrimination (Jobin et al. 2019). There are also optimistic views of AI with some regarding it as a miracle cure to solve all of humanity’s issues; excitement around self-driving cars to eliminate car accidents, pollution, and traffic; to solving medical issues in efficient ways; and manual labour would be a thing of the

past (Morgan et al. 2019). Contrarily, Elon Musk, the CEO of Tesla and SpaceX, has asserted that "AI is a fundamental risk to the existence of human civilization" at the National Association (Morgan et al. 2019). Additionally, the late Stephen Hawking issued a dire warning in 2017: “Success in creating effective AI, could be the biggest event in the history of our civilization. Or the worst” (Morgan et al. 2019). Both the extremes of the positive and the negative need to be analysed critically and the only way the process can be guided is to consider human dignity and the ecology concerning AI, policy needs to take centre stage.

4.3 GLOBAL LANDSCAPE OF AI ETHICS

To have an overview of global ethics, it has to be noted that discussing each country’s documents is too much for this scope and the landscape will be categorised according to the public sector, private sector, and NGOs from a global perspective. It is however helpful to view the bigger picture in the following figures. It is also important to note that AI ethical guidelines are constantly being produced and the numbers keep on increasing. There have been several studies conducted to analyse AI ethical documents and to have an overview from a global perspective. In essence, the main goal and focus of the studies has been to assess the extent to which a worldwide consensus on AI ethics is developing (Schiff et al. 2021).

Jobin et al. (2019) conducted a scoping review of documents from 2016 to 23 April 2019. A scoping review is a technique for analysing and organizing the literature that is thought to be particularly effective for complicated or varied fields of study. The selection included documents that are non-legal or soft law published by organisations containing non-academic and non-legal grey literature for principles and guidelines for ethical AI. A total of 84 documents were identified and analysed written in English, German, French, Italian, and Greek by the public sector, private sector, NGOs, and other institutions. The majority of the documents are written in English. Figure 1 illustrates the number of ethical AI documents from a geographical point of view; the majority of AI ethics guidelines are published in the United States (n = 21) and the European Union (19), with the United Kingdom (13) and Japan coming in second and third (4). With one document respectively, Canada, Iceland, Norway, the United Arab

Emirates, India, Singapore, South Korea, and Australia are all represented. The member states of the G7 countries are highlighted separately after endorsing a unique G7 statement (Jobin et al. 2019).

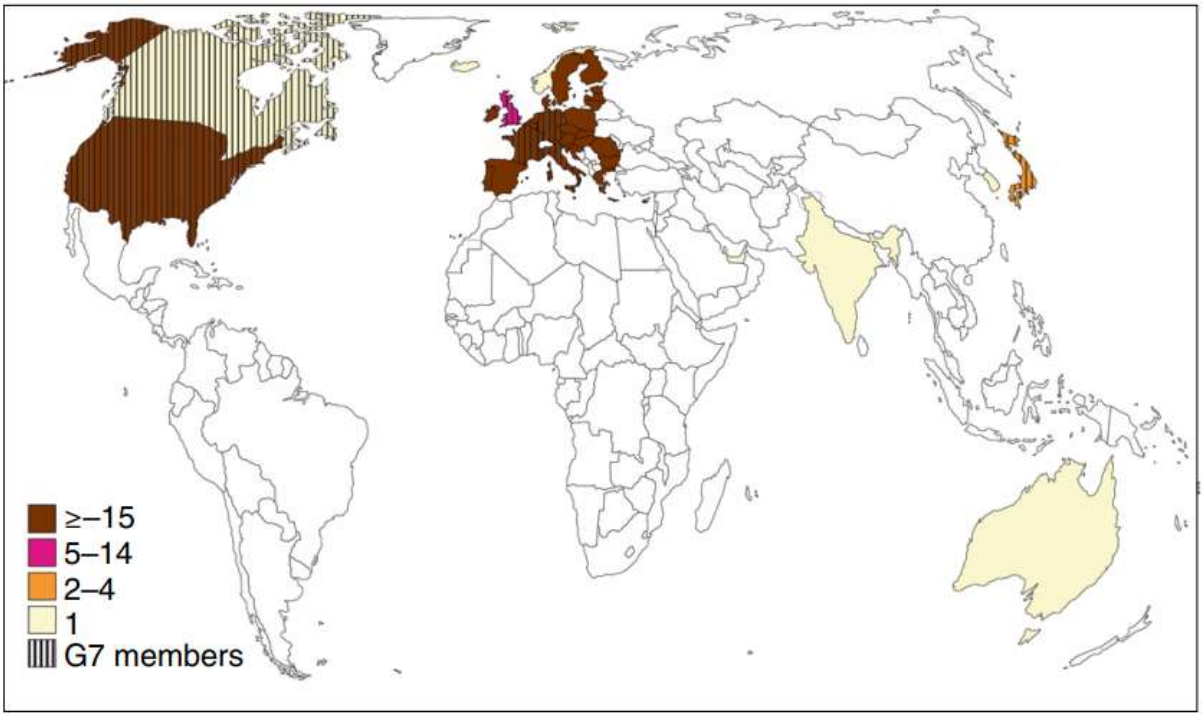

Figure 1 Geographic distribution of issuers of ethical AI guidelines by number of documents released (Jobin et al. 2019)

The study of the content revealed eleven major ethical norms and concepts. According to how frequently they appeared across various sources, they are transparency, equity, non-maleficence, accountability, respect for others' privacy, beneficence, autonomy, freedom, dignity, sustainability, and solidarity (Jobin et al. 2019). Another study was done by Fjeld et al. (2020) in their research of 36 papers. They found eight principles that were related to those of Jobin et al. (2019) namely: privacy, accountability, safety and security, transparency and explainability, fairness and non-discrimination, human control of technology, professional responsibility, and promotion of human values (Fjeld et al. 2020).

Schiff et al. (2021) conducted a study of several AI ethics documents by country with a sample of 112 documents at the time as seen in Figure 2. The criteria of the study excluded academic studies, opinion pieces, and speeches, but included document

types such as ethics principles, frameworks, and policy plans. Priority was given to ethical documents that focused on AI broadly rather than documents that are narrowly based. The analysis focused on English-language writings that discuss AI and ethics and were released between January 2016 and July 2019 (Schiff et al. 2021).

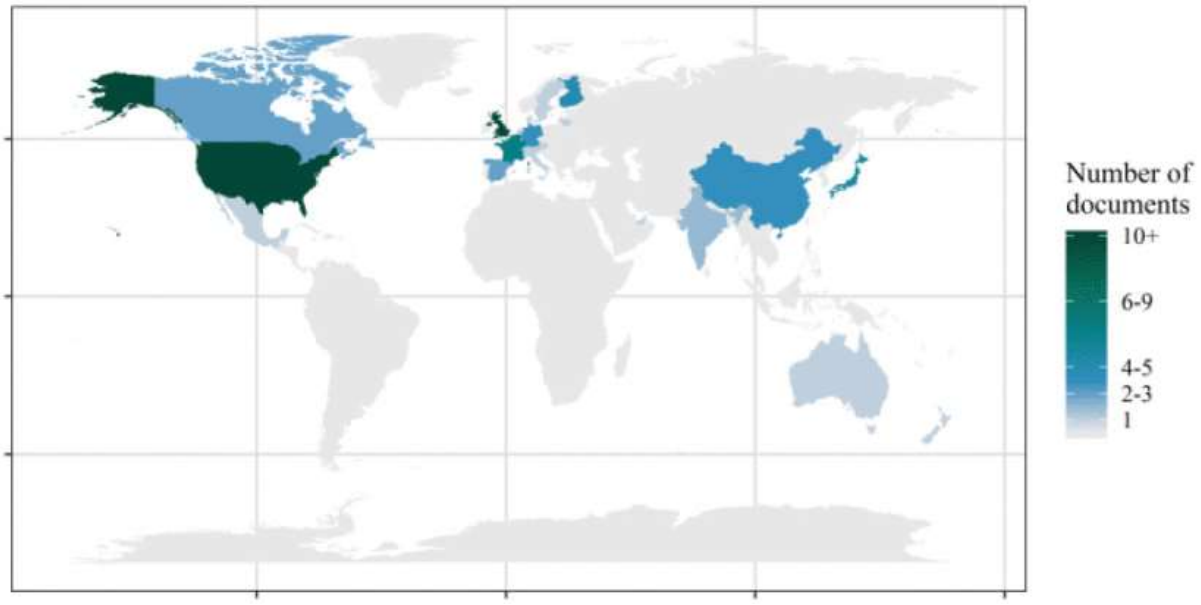

Figure 2 AI ethics documents included in the analysis by country. The country indicated is the headquarters of the first authoring organisation (Schiff et al. 2021)

The following Figure 3, represents the type of participation in terms of the people or groups involved in the creation of a document by showing the findings from all 112 papers. According to the findings, compared to the private sector, NGOs and the public sector use participatory processes much more frequently (Schiff et al. 2021).

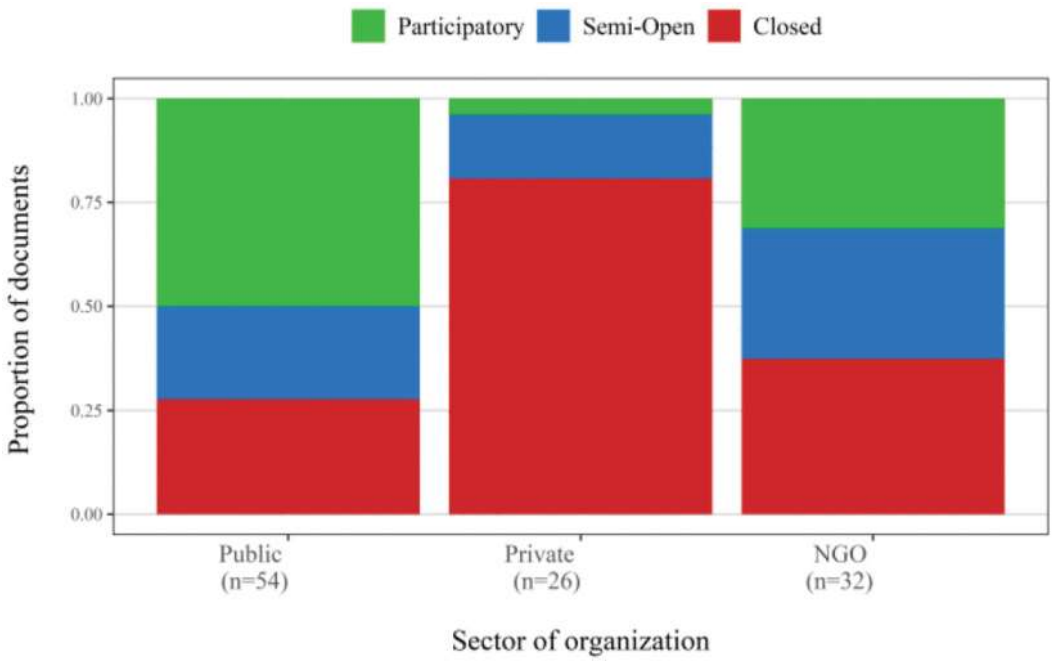

Figure 3 Participatory engagement by organisation sector (Schiff et al. 2021).

Wide-ranging public participation is important because it could influence how an AI ethics debate is represented. For instance, a larger and deeper assessment of AI ethics issues may result from a more diverse set of viewpoints. Closed participation processes might reflect an "expert" approach that relies on a few individuals to deliberate on AI ethical issues which could be limiting (Schiff et al. 2021). Figure 3 illustrates that NGOs and the public sector use participatory processes much more frequently than the private sector.

According to Schiff et al. (2021), documents from the private sector seem to be more focused on client and customer-related ethical problems that could be resolved technically. Documents from the public sector emphasize economic development and unemployment, while those from NGOs cover a variety of ethical topics that receive less attention from other sectors. There is thus a global consensus on AI ethics but there are also differences which deserve consideration that can guide better process and collaboration (Schiff et al. 2021). The studies also show that both public and private sectors are concerned about AI ethics even though the priority of problems and solutions are diverse. Additionally, the underrepresentation of geographical regions like Africa, South and Central America, and Central Asia shows that global regions are

not engaging equitably in the AI ethics debate, which exposes a power disparity in the global conversation (Jobin et al. 2019).

According to Schiff et al. (2020), the majority of AI ethics documents are published by the public sector (government) and intergovernmental bodies. These creators include…

> …European Union nations (especially France, Germany, and Italy), the United States, the United Kingdom, Canada, countries in the Nordic-Baltic region (such as Finland, Sweden, and Denmark), Japan, China, India, Mexico, Australia, and New Zealand. At the intergovernmental level, multiple bodies under the European Union have been active along with the OECD, the G7, and the G20 (Schiff et al. 2020).

The following subsections will discuss in detail some of the leading AI ethics guidelines by the public sector in the global context.

4.3.1 Organisation for Economic Co-operation and Development (OECD) and AI policy

According to OECD (2023), the OECD is an international organisation that aims to create better policies for better lives. Their objective is to create policies that promote equality, opportunity, prosperity, and well-being for all. OECD collaborates with governments, policy decision-makers, and individuals to create evidence-based worldwide standards and address a variety of social, economic, and environmental issues. Member countries of the OECD and a host of partner countries which consist of more than 100 countries work together on important global challenges at the national, regional, and local levels (OECD 2023). According to CAIPD (2022:31), the initiative to create and build the most well-known framework for AI policy has been spearheaded globally by the OECD. The OECD and its member states worked together to build a coordinated global approach, which is what led to this outcome. The OECD AI Principles also build on past OECD projects including the OECD Privacy Guidelines, the first global framework for data protection and a widely used framework for transborder data flows (CAIPD 2022). Although the OECD's policy guidelines do

not apply specifically to its member states, do not have binding legal effect, and are not treaties; the adoption of national laws based on OECD policies is commonplace, and there is a strong convergence of legal standards, notably in the area of data protection (CAIDP 2022).

According to OECD (2020:3) on May 22, 2019, the Committee on Digital Economy Policy (CDEP) proposed that the OECD Council at the ministerial level approve the Recommendation on Artificial Intelligence (AI), the first intergovernmental standard on AI. Through promoting the trustworthy stewardship of AI and upholding respect for democratic principles and human rights, the recommendation seeks to promote innovation and public trust in AI. The Recommendation focuses on AI-specific challenges and establishes a standard that is implementable and sufficiently flexible to stand the test of time in this consistently developing field, integrating existing OECD standards in areas like privacy, digital security risk management, and responsible business conduct (OECD 2020). The recommendations are divided into two sections with a focus on the AI developers and the policy-makers. The recommendations for AI developers are summarised as follows (OECD 2020):

- inclusive growth, sustainable development and well-being;
- human-centred values and fairness;
- transparency and explainability;
- robustness, security and safety;
- and accountability.

The recommendations for policy-makers are summarised as follows (OECD 2020):

- investing in AI research and development;
- fostering a digital ecosystem for AI;
- shaping an enabling policy environment for AI;
- building human capacity and preparing for labour market transformation;
- and international cooperation for trustworthy AI.

These recommendations are followed up with an implementation, support, and monitoring system to assist OECD member countries and non-member countries in AI development and policy advancements. It is important to note that the OECD AI principles were adopted by G20 nations in June 2019 (G20 will be explained in its

section). The OECD has established initiatives to implement and monitor the OECD AI recommendations namely; the Global Partnership on AI (GPAI), the OECD AI Observatory, National implementation, and the OECD Network of Experts on AI (ONE PAI) (CAIDP 2022).

4.3.1.1 The Global Partnership on AI

According to GPAI (2023), the Global Partnership on AI was established in June 2020 to bring together specialists from academia, business, civil society, international organizations, and government to close the gap between theory and practice in artificial intelligence (AI). To comprehend its effects, encourage responsible growth, and solve any difficulties, GPAI will objectively analyze the scientific, technical, and socio-economic components of AI through the cooperation of its working groups. Beginning with responsible AI (including the creation of AI in response to pandemics), data governance, the future of work, and innovation and commercialization, the four working groups of GPAI will concentrate on these topics (GPAI 2023).

4.3.1.2 OECD AI Observatory (OECD.AI)

According to OECD.AI (2023), the OECD AI Observatory utilizes the OECD AI recommendations to establish a platform for public AI policy. This platform (https://oecd.ai/en/) combines resources from the OECD, its partners, and all relevant stakeholders to bring together a dialogue between those involved. It provides research and analysis of the areas where AI has the most impact, and its core attributes include multidisciplinarity, evidence-based analysis, and global multi-stakeholder partnerships (OECD AI 2023).

4.3.1.3 National implementation

Part of the OECD AI recommendations is to monitor the implementation of the OECD AI principles in countries around the world. The *State of Implementation of the OECD AI Principles: Insights from National AI Policies* (2021) is the first report that provides an analysis of the implementation of the AI policy recommendations (OECD 2021). The OECD Principles on Artificial Intelligence are presented in this study along with a

detailed review of how they have been applied to policy. The source of information is based on the expert input from meetings of the OECD.AI Network of Experts working group on national AI policies and the EC-OECD database of national AI policies and strategies which offers an evidence-based analysis on the implementation of the five recommendations in the OECD AI Principles (OECD 2021).

4.3.1.4 The OECD Network of Experts on AI (ONE PAI)

According to OECD (2023), the OECD.AI Network of Experts is an informal group of experts from various sectors who provide policy advice to the OECD on AI. It also serves as a platform for the OECD to share data and collaborate with other international organizations, as well as raise issues concerning trustworthy AI for international cooperation. Furthermore, it provides a forum for discussion of AI policy opportunities and challenges. The OECD is dedicated to encouraging public debate about the implementation of trustworthy AI. To encourage this type of dialogue, they have launched an AI-focused blog, AI Wonk (https://oecd.ai/en/wonk) with contributions from AI experts on current topics (OECD 2023).

4.3.2 G7 and AI policy

According to Reuters (2022), the G7 or Group of Seven is an informal alliance of seven wealthy Western nations, including the United States, the United Kingdom, Canada, France, Germany, Italy, and Japan, as well as the European Union. It has no permanent secretariat and operates on a rotating presidency, with Japan taking over in 2023. G7 summits were originally intended to address economic and financial issues, such as oil crises, but have since been used to explore solutions for debt reduction among poorer nations and to address political issues. Russia was a member of the G8 from 1997 to 2014, but its membership was suspended after the annexation of Crimea.

The G7 serves as the starting point for some critical AI policy work. Before the 2016 G7 summit in Japan, Prime Minister Shinzo Abe directed his government to develop AI policies that could serve as a model for the rest of the world (CAIDP 2022). At the subsequent G7 ICT meeting in Shikoku, Japan's ICT Minister Sanae Takaichi

presented eight principles for the development of AI. These principles emphasize the significance of human control and human rights. Her suggestion was well received, prompting further discussion (Japan Times 2016).

France and Canada recognized the potential of AI and its ability to revolutionize our lives, work, and society ahead of the G7 2018 Summit. Both countries understood that AI is a transformative technology that will soon have an impact on all aspects of humanity, opening up new opportunities. That is why they want to develop global expertise to comprehend and forecast the consequences (France Diplomacy 2018). Every year before the G7 summit, the scientific academies from each of the member states come together at the invitation of the host country's academy to discuss key topics in science. Upon completion of their reflections, they provide joint statements and recommendations to the governments in the leadup to the summit. In March 2019, the French Académie des Sciences held a meeting to prepare for the upcoming G7 summit in Biarritz this August. The three topics that were discussed were: science and trust, artificial intelligence and society, and citizen science in the internet age (Académie des Sciences 2019).

At the 2021 G7 summit hosted by the United Kingdom, the G7 committed to continuing to take decisive steps to increase transparency in our technologies, leveraging the Open Government Partnership. We will continue to collaborate with the G7 and other partners in support of the work of the Global Partnership for Artificial Intelligence (GPAI), which was advanced by the Canadian and French G7 Presidency in 2018 and 2019, to ensure that AI is developed and used responsibly and for the benefit of all (White House 2021).

4.3.3 G20 and AI policy

According to G20 (2023), the Group of Twenty (G20) is an international economic cooperation forum with a significant impact on the global economic system. It was established in 1999 in the aftermath of the Asian financial crisis to allow Finance Ministers and Central Bank Governors to discuss financial issues. Due to the global economic crisis, the G20 was elevated to the level of Heads of State/Government in 2007 and was designated as the primary forum for international economic cooperation

in 2009. It is made up of 19 countries (Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, and the United States) and the European Union. The G20 members collectively account for approximately 85% of global GDP 75% of global trade, and two-thirds of the world population (G20 2023). The G20 Summit is held once a year and is led by a rotating Presidency. From 1 December 2022 to 30 November 2023, India presides over the G20 (G20 2023).

It is important to note that the OECD has served as a consultant to the G20. OECD attends all G20 Working Group meetings and provides relevant data, research, and recommendations on specific topics, frequently in collaboration with other international organizations (OECD 2023). In 2019, G20 leaders committed to a human-centred approach to AI. The G20 AI Principles were endorsed, to foster public trust, utilise AI to advance the SDGs, and promote a sustainable and inclusive society. The OECD Recommendation on AI served as the basis of these non-binding principles (OECD 2020). G20 countries are actively exploring how to make the most of AI while mitigating its potential risks. This includes data access, sharing, and flows. The Digital Economy Task Force under the 2020 Saudi Presidency provided countries with a policy report *Examples of AI National Policies* to help implement the G20 AI Principles. This report aims to foster public trust and confidence in the technology (OECD 2020). The OECD provided policy advice to the G20 on a variety of topics including smart mobility, digital economy, AI strategies, data and data flows, and digitalisation support during COVID. They also provided a report and presentation on measuring the economic impact of the space sector at the Space20 meeting (OECD 2023).

4.3.4 United Nations and AI Policy

According to the United Nations (2023), the United Nations (UN) was founded in 1945 with 51 founding members and has since grown to the current 193 member states. Its Charter outlines its objectives and regulations. It has adapted to a changing world, but its primary purpose of providing a platform for all countries to collaborate on global issues that benefit humanity remains unchanged. In 2015, the United Nations began investigating AI with the General Assembly event concerning International Security

and AI. Additionally, the UN Interregional Crime and Justice Research Institute (UNICRI) established a program on AI and Robotics (CAIDP 2022).

In June 2020, the secretary general of the United Nations produced a report Roadmap for Digital Cooperation that provides a plan of action in which all parties involved can take part in creating a more secure, just digital landscape which will result in a brighter and more successful future for everyone (United Nations 2020). In regards to AI, the report articulates that AI can provide enormous benefits to digital progress, but it can also endanger user security and autonomy. To build capacity for using AI in a way that is safe, secure, respects human rights, is sustainable, and promotes peace, a multi-stakeholder approach to global AI cooperation is required (United Nations 2020). Within the United Nations, some bodies have engaged in AI ethics as but not limited to UNESCO, the UN High Commissioner for Human Rights, and the United Nations Office for Disarmament Affairs,

4.3.4.1 UNESCO

UNESCO is an acronym for the United Nations Educational, Scientific and Cultural Organization. UNESCO works to foster global peace and security by encouraging international cooperation in the areas of education, sciences, culture, communication and information. As part of its mandate, UNESCO aims to meet the Sustainable Development Goals (SDGs) laid out in the UN 2030 Agenda (UNESCO, 2023). In 2020, UNESCO began a two-year initiative to create a worldwide standard for Artificial Intelligence. This initiative resulted in the publication of a draft *Recommendation on the Ethics of Artificial Intelligence*. On November 24, 2021, the UNESCO recommendation was officially accepted at the 41st General Conference. This marks the first international consensus on the Ethics of Artificial Intelligence (CAIDP 2020; UNESCO 2021).

4.3.4.2 UN High Commissioner for Human Rights

The UN High Commissioner for Human Rights, Michelle Bachelet, has pointed to the necessity for a pause in the sale and usage of Artificial Intelligence systems that have the potential to cause harm to human rights until appropriate measures are established. Bachelet additionally suggested that applications of AI which cannot be

used following international human rights laws should be prohibited (United Nations 2021). The UN High Commissioner for Human Rights published a report *The Right to Privacy in the Digital Age* that details how AI systems have been used without proper inspection, resulting in unfair decisions and outcomes. Cases of unjust treatment have been reported, such as people being denied benefits due to faulty AI and arrests based on flawed facial recognition. Data is collected, shared and analysed to inform AI, but this data can be faulty, outdated or biased. Long-term storage of data poses risks, as it could be exploited in unknown ways (United Nations 2021).

4.3.4.3 United Nations Office for Disarmament Affairs (UNODA)

Concerns have been raised about the use of artificial intelligence in lethal combat weapons. According to Scharre (2018:231), AI-powered autonomous weapons could improve accuracy and reaction time. However, these weapons raise ethical and legal concerns, such as their ability to reduce innocent civilian casualties. According to the Campaign to Stop Killer Robots (2018), these weapons are difficult to control and monitor, making compliance with international law difficult. As a result, there is a need for regulation and management of AI-powered lethal weapons in warfare.

UNODA supports disarmament initiatives such as the General Assembly and its First Committee, the Disarmament Commission, the Conference on Disarmament, and others. It promotes military disarmament through dialogue, transparency, and trust. Regional meetings and the Register of Conventional Arms also help to promote disarmament (United Nations 2023). In regards to AI and autonomous weapons, the Group of Governmental Experts (GGE) discussed the questions related to emerging technologies in the area of lethal autonomous weapons systems (LAWS) and subsequently, the November 2019 Meeting of the High Contracting Parties to the Convention on Certain Conventional Weapons (CCW) adopted 11 guiding principles on LAWS (CCW 2019; United Nations 2023).

4.3.5 Council of Europe (CoE) and European Union (EU): AI policy

According to the Council of Europe (2023), the Council of Europe and the European Union both have fundamental values they adhere to, such as human rights, democracy and respect for the law. The Council of Europe brings together governments of

European countries to form agreements and monitor their implementation. The European Union extends these agreements and also applies them to countries near its borders. Though they are separate entities, they collaborate to uphold shared values.

4.3.5.1 Council of Europe

The Council of Europe is the foremost organization devoted to protecting human rights across the continent. Additionally, it consists of 46 nations, 27 of which are part of the European Union. All member countries of the Council of Europe have committed to the European Convention on Human Rights, which is designed to safeguard human rights, democracy, and the rule of law. The European Court of Human Rights is responsible for ensuring that each nation adheres to the Convention (Council of Europe 2023). The Council of Europe sought to update Convention 108, making it applicable to the new technologies that were emerging. This entailed strengthening the Convention's implementation, to better protect the privacy and personal data of individuals. Convention 108 has been revised to reflect the latest technological advancements and to ensure stronger implementation in 2018 (Council of Europe 2018; Council of Europe 2023).

The Council of Europe's Committee of Ministers established CAHAI, an Ad Hoc Committee focusing on Artificial Intelligence, at its 1353rd meeting on 11 September 2019. The goal is to investigate the feasibility of developing a legal framework for artificial intelligence based on the Council of Europe's standards for human rights, democracy, and the rule of law. This framework will go through extensive multi-stakeholder consultations (Council of Europe 2019). The Committee of Ministers adopted a declaration on the 17th of March 2021 on *The Risks of Computer-Assisted or Artificial-Intelligence-Enabled Decision Making in the Field of the Social Safety Net* that highlights that computer-assisted/AI-enabled decisions in social services may pose risks to human rights. These systems must be developed with legal certainty, data quality, non-discrimination, and transparency. Oversight is necessary to mitigate errors and protect vulnerable persons, while accountability processes must exist to address violations. Those affected must be able to access explanations and challenge decisions that affect their lives (Committee of Ministers 2021).

4.3.5.2 European Union

The European Union is a collective of 27 countries from across Europe which work together to oversee economic, social and security policies. Although originally confined to Western Europe, in the early 21st century, the EU was extended to include countries from Central and Eastern Europe (Britannica 2023). Many institutions within the European Union focus on AI and digital policy. We will therefore focus on the significant developments. Following the November 2020 election in the United States, the European Commission unveiled a new framework for transatlantic relations. The European Commission proposed a New EU-US Agenda for Global Change on December 2, 2020. In regards to AI, the European Commission states: “We need to start acting together on AI - based on our shared belief in a humancentric approach and dealing with issues such as facial recognition. In this spirit, the EU will propose to start work on a Transatlantic AI Agreement to set a blueprint for regional and global standards aligned with our values” (European Commission 2020; CAIDP 2022).

On September 29, 2021, the European Commission Executive Vice President Margrethe Vestager, European Commission Executive Vice President Valdis Dombrovskis, US Secretary of State Antony Blinken, US Secretary of Commerce Gina Raimondo, and US Trade Representative Katherine Tai co-chaired the first EU-US Trade and Technology Council (TTC) meeting in Pittsburgh. The European Union and the United States have agreed to collaborate on global technology, economics, and trade issues, as well as to strengthen their transatlantic trade and economic relationships while keeping democratic values at the forefront. EU and US recognize that AI can offer numerous advantages, while also posing potential risks to shared values and freedoms. Both are committed to creating innovative and reliable AI that respects universal human rights and shared democratic values (European Commission 2021).

According to the European Commission (2023), the European AI Strategy seeks to make the EU a leading destination for AI, with a focus on making sure AI is respectful of human values.

To achieve this, in April 2021 the European Commission developed a package of initiatives including:

- its Communication on fostering a European approach to AI;
- a review of the coordinated plan on AI (with EU member states);
- its proposal for a regulation laying down harmonised rules on AI (EU AI ACT) and relevant impact assessment.

The EU is responding to the increasing global investment in AI with a regulatory framework and revised plan. Both are focused on promoting the development of AI while addressing safety and human rights issues. This is intended to ensure the EU is ready to take advantage of the opportunities of AI while minimizing potential risks (European Commission 2021).

The 2021 Coordinated Plan on Artificial Intelligence is a strategy to accelerate investments in AI technologies, create enabling conditions for its development, promote excellence from lab to market, ensure AI works for people, and build EU leadership in high-impact sectors. This is part of a broader effort to achieve global leadership in trustworthy AI and bolster the EU's economic and social recovery. The Plan is accompanied by a Proposal for a Regulation on Artificial Intelligence (European Commission 2021).

The EU Commission has put forth a regulation (EU AI ACT) that deals with the potential risks of AI, allowing the EU to have a leading role in the global arena. It outlines four levels of risk (unacceptable, high, limited, and minimal) and seeks to ensure that Europeans can trust AI. Alongside the Regulation is the Coordinated Plan on AI, which is aimed at creating an AI ecosystem of excellence (European Commission 2021).

Another major development in the European Union about digital rights and privacy is the General Data Protection Regulation (GDPR). The GDPR is a stringent EU regulation. It applies to any organization that targets or collects data on EU citizens, with severe penalties for violators. The regulation, which went into effect in May 2018, is extensive and far-reaching, making compliance difficult, particularly for small and medium-sized enterprises (SMEs). It demonstrates Europe's commitment to data privacy and security in the face of rising breaches (GDPR 2023). The European

Parliament Research Service published *the impact of the General Data Protection Regulation (GDPR) on artificial intelligence* (2020). The study investigates the relationship between the GDPR and artificial intelligence, examining the potential risks and benefits for individuals and society. The authors examine the consequences of purpose limitation, data minimization, automated decision-making, and the GDPR's preventive, risk-based approach. It investigates whether data subjects have a right to individual explanations, as well as the safeguards that should be implemented when automated decisions are made (European Parliament Think Tank 2020).

4.3.6 African Union (AU) and AI policy

The African Union recognizes the power of artificial intelligence and digital technologies to bring about change and further development across the continent and has developed policies and frameworks to assist in the effective management of these tools. This section will discuss the initiatives by the African Union such as the AU Convention on Cyber Security and Personal Data Protection, the AU working group on AI, the African Commission on Human and Peoples' Rights resolution 473, and the AU Data Policy Framework.

The main regional tool for AI was adopted at the 2014 African Union Convention on Cyber Security and Personal Data Protection also known as the Malabo Convention. Although Africa is frequently regarded as a haven for cybercriminals, this Convention was developed to make it easier to regulate cyber activity, with a primary focus on three areas: (1) electronic transactions, (2) personal data protection, and (3) cyber security and cybercrime (CAIDP 2022; African Union 2014). The African Union (2014) states that the importance of the Malabo Convention is that African states are in “dire need of innovative criminal policy strategies that embody states, societal and technical responses to create a credible legal climate for cyber security.” Some of the cybercrime cases have cost South Africa R2.65 billion between January 2011 to August 2012 as reported by the South African Cyber Threat Barometer 2012/13. In East African countries, the cost of cybercrime is estimated at Ksh 2 billion annually (Van Zyl 2014; Ugwu 2014).

On the 3rd and 4th of December 2019, the African Union's Working Group on Artificial Intelligence held its first consultative meeting in Cairo. The meeting's purpose was to discuss the group's objectives, which included developing an AI strategy and developing a unified African position, as suggested by Egypt. To share knowledge, the members also discussed the approaches to AI taken by Ethiopia, Cameroon, Uganda, Algeria, and Egypt. The group also discussed a few methods that can help AI in Africa, such as the AI observatory and the readiness indicator (DataGuidance 2019; MCIT 2021). The AI Working Group was formed to develop an African AI strategy, unifying African perspectives on AI topics, and participating actively in international AI conversations. This will enable African nations to express their needs and concerns while also ensuring that African perspectives are heard in international forums. Furthermore, the AI Working Group will address the various AI issues confronting Africa, as well as promote the development of AI regulations and secure data access (MCIT 2022). The first virtual gathering took place in February 2021. The primary outcome of these gatherings was the publication of the "Common Africa Position Paper on Africa's Priority Areas for AI." The second meeting, held on December 14-15 at Cairo's Sultan Hussein Kamel Palace, saw attendees discuss the Position Paper, examine African national experiences, examine tactics developed in other regions, and lay the groundwork for the African strategy. Having unified positions on AI will help the African Agenda 2063 have a long-term plan toward a peaceful, integrated, people-focused, and prosperous continent, with objectives and approaches to achieve this ambition in the shortest time possible (MCIT 2022).

The African Commission on Human and Peoples' Rights met virtually for an Extraordinary Session from the 19th to the 25th of February 2021. At this meeting, Resolution 473 was adopted, advocating for a study of how AI and other new technologies impact human and peoples' rights in Africa with an emphasis on African values and ethics such as *Ubuntu* (ACHPR 2021). Some of the key important statements made by the commission:

- The commission Calls on State Parties to ensure that the development and use of AI, robotics and other new and emerging technologies are compatible with the rights and duties in the African Charter and other regional and international human rights instruments, to uphold human dignity, privacy, equality, non-discrimination, inclusion, diversity, safety, fairness, transparency, accountability and economic

development as underlying principles that guide the development and use of AI, robotics and other new and emerging technologies.

- The commission Urges State Parties to ensure that all AI technologies, robotics and other new and emerging technologies that are imported from other continents are made applicable to the African context and or adjusted to fit Africa's needs, and to give serious consideration to African values and norms in the formulation of AI governance frameworks to address the global epistemic injustice that currently exists.
- The commission Commits to undertake a study to further develop guidelines and norms that address issues relating to AI technologies, robotics and other new and emerging technologies and their impact on human rights in Africa working together with an African Group of Experts on AI and new technologies (ACHPR 2021).

The Africa Union recently released a comprehensive Policy Framework focusing on data governance in July 2022, making it one of the most important documents of its kind on the continent. The Framework is intended to guide African countries as they develop effective data governance regimes to capitalize on the continent's current data and digital revolution (CIPESA 2022). According to the African Union (2022), the Africa Data Policy Framework aims to assist member countries in strengthening their data systems and stimulating innovation, thereby creating an environment conducive to data-driven economies. It serves as a tool for coordinating efforts across the continent to enable interconnectivity, which facilitates investments and creates public and private value. The framework applies to all data types, including personal, non-personal, industrial, and public data. It advises member countries on data policy domestication and contributes to the realization of an African single digital market.

4.4 MAJOR TECH COMPANIES' AI DEVELOPMENT AND POLICY

In discussing public policy on AI, it is equally important to discuss corporate companies' development of AI and their policies on AI. It has already been stated that corporations have closed participation when it comes to AI principles. The other aspect of this section is the debate between internal regulation and external regulation of AI. Even though many major companies and start-ups develop AI products and services, however, the corporations that will be discussed in this section are Google, Microsoft, IBM, Amazon, Facebook (Meta), OpenAI, and Baidu.

4.4.1 Google

According to Hall and Hosch (2023), Google is an American search engine company, founded in 1998 by Sergey Brin and Larry Page. It is a subsidiary of Alphabet Inc. and handles over 70% of all online search requests. Google provides more than 50 services and products, including e-mail, online document creation, and mobile phone software. It is one of the world's top four influential companies in the high-tech market and earns nearly all of its revenue from Google advertising based on user search requests. According to Google AI (2023), AI can significantly benefit individuals and society by making knowledge more accessible, assisting in decision-making and problem-solving, fostering creativity, and addressing societal difficulties. It can also help to lessen structural injustices and encourage scientific advancements that will help mankind achieve its long-term objectives.

The use of Artificial Intelligence has the potential to revolutionize existing tools, products and services, ranging from hardware and software to non-AI-related goods and services. For example, Google Search, Google Maps, Google Photos, Google Workspace, Android and Pixel phones, have already been impacted by AI, and will become even more valuable to individuals. Additionally, AI will lead to the development of new types of products, services and tools, which may have unprecedented capabilities and performance. Some examples of this include more advanced language translators, conversational AI and assistants, generative and multi-modal AI, robotics and autonomous vehicles (Google AI 2023).

Although several issues have been raised concerning Google's usage of AI, they have taken steps to address these matters and have made firm pledges to responsible AI development. Here are some of the controversies that have been reported in the media concerning Google's AI development:

(a) In 2015, Google Photos faced a major error when it labelled photos of black people as "gorillas". Google has since apologized and fixed the issue. They understand that more work needs to be done to improve their automatic image labelling and are taking steps to make sure similar mistakes don't occur again. A software developer's tweet prompted an engineer from Google to swiftly respond and address the issue (Dougherty 2015).

(b) Google faced backlash in 2018 over its involvement in Project Maven, a military AI project which sought to use AI to improve the military's ability to analyse combat data and target areas. In March 2019, the company announced it would not renew its contract and released new AI principles. The move was controversial; some employees welcomed the decision while others, including former defence officials, worried about its effect on the U.S.'s security capabilities (Harwell 2018).

(c) Google's use of subcontracted workers to collect face scans in exchange for gift cards has sparked criticism over data harvesting and deceptive tactics. Advocates of digital civil rights and racial justice have expressed outrage, while Google has stated it is investigating the allegations (Wong 2019).

(d) Google has ended its AI Ethics Board after facing outcry over its members, specifically Kay Coles James. Over 2,650 people, including Google employees, petitioned to have her removed due to her stances on LGBTQ rights and immigration. Additionally, some of the other members, such as Alessandro Acquisti and Luciano Floridi, either resigned or recommended James' dismissal. Google is now looking for other ways to obtain outside opinions on artificial intelligence ethics and fairness (D'Onfro 2019).

According to Google AI (2023), they are committed to being responsible for AI, taking the lead in its development, application, and ongoing assessment. They work to empower consumers, create safe and useful solutions using their AI Principles, and assess their methods to make sure they are responsible. They are also creating guidelines and best practices for fresh applications of AI. Google works to build technologies that positively impact humanity, with a focus on solving major problems. Optimistic about the potential of AI and other advancements, the company has committed to responsible development via its AI Principles, which guide the applications it will not pursue (Google AI 2023).

Google AI principles are based on these 7 objectives (Google AI 2023):

- Be socially beneficial
- Avoid creating or reinforcing unfair bias.
- Be built and tested for safety.

- Be accountable to people.
- Incorporate privacy design principles.
- Uphold high standards of scientific excellence.
- Be made available for uses that accord with these principles.

In addition to these AI principles, Google has mentioned their development of AI will not create AI technology for weaponry or surveillance that violates international law or that has the potential to cause or is likely to cause harm. Google mentions that they uphold human rights and international law, and as they gain more expertise, their list of applications may change. They shall approach their work in the AI area with humility, engagement, and readiness to adapt (Google AI 2023).

4.4.2 Microsoft

According to Zachary and Hall (2023), Microsoft Corporation is an American top producer of software systems and applications for personal computers. Additionally, they create their brand of tablet computers, publish books and multimedia publications, offer email services, and promote electronic gaming consoles and computer peripherals (input/output devices). For many years, Microsoft has made significant investments in AI research and development. They offer a variety of AI products and services across their platforms, which include Windows, Office, Azure, and Xbox. Microsoft's key AI offerings include the following:

- Azure AI - an expansive set of tools designed to help developers and data scientists create AI solutions. It provides access to advanced vision, speech, language, and decision-making models, as well as a powerful supercomputing infrastructure, with popular tools and open-source frameworks (Microsoft 2023).
- Microsoft 365 Copilot - AI embedded in Microsoft 365 apps. Copilot in Word, PowerPoint and Outlook can assist with writing, editing, summarizing, giving suggestions and creating presentations from simple prompts or outlines, as well as help drafting emails, summarizing threads, and catching up on conversations.
- (New) Bing - a powerful AI-powered tool that can help in research, planning, and creativity. It can provide detailed answers to complex questions,

summarize results from across the web, and even help with creative projects. It also provides a chat experience with up to 5 interactions, to keep conversations on track.

- GitHub Copilot - the world's first AI-powered developer tool, allowing coders to create better, faster code. It assists with natural language prompts and provides alternative solutions, tests and algorithms in real-time within the editor.
- Power BI - Power BI's AI capabilities allow users to quickly uncover patterns, trends, and anomalies in their data, without needing to create custom models. Non-technical employees can easily detect fluctuations, spot trends and get visual answers to their data questions using natural language.

Microsoft has more research and development in regards to AI but there were concerns about the AI products and services Microsoft developed. Here are some of the controversies that have been reported in the media concerning Google's AI development:

(a) In 2016, Tay, an AI-powered bot from Microsoft, was taken offline after being taught to be racist and repeat inflammatory political opinions. It was created by a team of improvisational comedians and responded to offensive content with nonchalance, prompting Microsoft to delete some of the tweets. The incident has sparked debates about anti-abuse measures and engineers' responsibility to prevent technology from reflecting the worst aspects of humanity (Perez 2016).

(b) A 2018 MIT study revealed that three facial recognition systems (including Microsoft) had higher error rates for darker skin tones and women. Microsoft responded by diversifying their datasets to include a variety of people, which led to a dramatic reduction in errors. The company also strives to ensure AI tools are fair, accurate, and inclusive, taking into account values reflected in the systems (Roach 2018; Najibi 2020).

(c) In 2020, Microsoft's "Productivity Score" feature, which allows managers to track employee activity on Microsoft 365 at an individual level, has been criticised by privacy campaigners as workplace surveillance. In response to feedback from users who are concerned about their privacy, Microsoft is making changes to the Productivity Score. The company is removing user

names from the product and modifying the user interface to make it clear that the Productivity Score is a measure of organizational adoption of technology, not individual user behaviour (Hern 2020; Spataro 2020).

According to Microsoft (2023), their approach when it comes to responsible AI is based on the six principles that Microsoft is committed to ensuring its AI technologies are produced considerately to gain public confidence. The six Microsoft AI principles are (Microsoft 2023):

- Fairness - AI systems should treat all people fairly.
- Reliability and safety - AI systems should perform reliably and safely.
- Privacy and security - AI systems should be secure and respect privacy.
- Inclusiveness - AI systems should empower everyone and engage people.
- Transparency - AI systems should be understandable.
- Accountability - People should be accountable for AI systems.

The approach of the AI principles is implemented by three teams which are the Aether Committee, the Office of Responsible AI (ORA) and the Responsible AI Strategy in Engineering (RAISE). The Aether committee was established in 2017 and guides the company's top executives on responsible AI matters, technologies, procedures, and standards. Its working groups conduct research and development and provide advice on emerging questions, difficulties, and opportunities. The ORA upholds the company's responsible AI principles by establishing corporate-wide standards through governance and public policy initiatives. ORA plays four distinct roles in this venture. Microsoft's RAISE initiative is an engineering team dedicated to responsible AI implementation. They are constructing the One Engineering System (1ES) which is based on Azure ML, providing customers with AI best practices and engineering teams with Microsoft's responsible AI standards (Microsoft 2023).

4.4.3 IBM

IBM, or International Business Machines Corporation, is a leading American computer manufacturer with a significant market share in the United States and other countries around the world. Its headquarters are in Armonk, New York (Britannica 2023). In

regards to AI, IBM provides a suite of business-grade products and solutions aimed at lowering the barriers to AI adoption and establishing a solid data foundation while optimizing for responsible use and outcomes. IBM researchers are working on the next generation of AI software and hardware to enable frictionless, cloud-native development and use of enterprise AI foundation models. Overall, IBM can assist businesses in quickly and ethically leveraging the benefits of AI in areas where it is most applicable (IBM 2023). Some of the AI and data products are:

- IBM Watson Assistant - Deliver consistent and intelligent customer care across all channels and touchpoints with conversational AI.
- IBM Watson Discovery - Accelerate business decisions and processes by applying natural-language, AI-powered content analysis to discover answers and insights faster.
- IBM Watson Orchestrate – Automate tedious tasks to a digital worker quickly and easily, changing the way you work.
- IBM Watson Knowledge Catalog - Activate business-ready data for AI and analytics with intelligent cataloging, backed by active metadata and policy management

Some of the concerns about IBM's use of AI technologies:

(a) The research *Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification* published in 2018 by Joy Buolamwini and Timnit Gebru highlights how IBM and other corporations had biased algorithms about their facial recognition systems (Buolamwini and Gebru 2018).

(b) NBC reported in 2019 that IBM was using Flickr photos to train facial recognition systems without getting permission from the people in the photos. According to the report, IBM used over one million photos from Flickr, including images of people's faces, to train its AI systems. Concerns were raised about privacy violations and a lack of transparency in IBM's data collection practices by critics (Solon 2019).

(c) IBM had previously tested facial recognition software with the New York Police Department and was looking to improve accuracy by taking into account gender and racial disparities. In light of police brutality and racial injustice in America,

IBM no longer develops facial recognition technologies due to mass surveillance and racial profiling (O'Brien 2020).

IBM's Trust and Transparency Principles for AI and data management are based on three things (IBM 2018):

- The purpose of AI is to augment human intelligence
- Data and insights belong to their creator
- New technology, including AI systems, must be transparent and explainable

IBM's AI strategy focuses on augmenting, rather than replacing, human intelligence. They are investing in action plans to assist people all over the world in developing the skills required to collaborate with AI technology (IBM 2018). IBM acknowledges that clients own the data and insights generated by IBM's cloud or AI. IBM is committed to protecting client data privacy and security by adhering to data privacy laws and implementing advanced security measures (IBM 2018). IBM will demonstrate when and why AI is being used, as well as data sources, attempts to combat prejudice, client ownership of business plans and intellectual property, and support for transparency and data governance regulations (IBM 2018).

4.4.4 Amazon

According to Hall (2023), Amazon.com is a renowned online retailer and provider of Web services, based in Seattle, USA. It sells a wide range of products, from books to music to electronics, either directly or as a middleman. It's also a leader in cloud computing, renting out data storage and computing resources. The market-leading Kindle e-book readers and its promotion of them have made Amazon a major force in book publishing. Amazon Web Services (AWS) offers a comprehensive set of services, infrastructure, and implementation resources to help businesses leverage the potential of AI and Machine Learning (ML) to innovate faster. Irrespective of the level of experience, businesses can access purpose-built AI services or utilize their models with AWS ML services to gain deeper insights from data while lowering costs. AWS ML services enable businesses to improve customer experience, optimize business processes, and accelerate innovation. These machine-learning services can

be utilized across various industries to solve real-world business problems (Amazon 2023). Here are some of the AI and ML services:

- Amazon Alexa - Alexa is Amazon's voice-activated assistant AI. Alexa uses AI to understand and respond to voice commands, provide personalized recommendations, and control smart home devices. Alexa is cloud-based and assists anywhere there is an internet connection and a device that can connect to Alexa. It is designed to make your life simpler, more fulfilling and more efficient through voice control both in and outside of your home (Amazon, 2023).
- Amazon Rekognition - Amazon Rekognition is a machine learning service that facilitates and reduces the costs associated with image recognition and video analysis. It can analyse large amounts of images and stream or store video quickly, and it can supplement human evaluation tasks with AI. It offers pre-programmed and customizable computer vision capacities which allows organizations to acquire valuable information and insights from images and videos (Amazon 2023).
- Amazon Translate - Amazon Translate is a machine translation service that provides quick, reliable, low-cost, and customizable language translation. It allows for the localization of content for multiple users all over the world and facilitates cross-lingual communication between users by translating and analyzing large amounts of text. Amazon Translate currently supports approximately 5,550 language combinations (Amazon 2023).
- Amazon Monitron – Amazon Monitron is a comprehensive system that utilizes machine learning to identify unusual patterns in industrial machines and make predictive maintenance easier. Amazon Monitron assists businesses in preventing malfunctions, increasing efficiency, and increasing productivity (Amazon 2023).

In light of the AI and ML innovations at Amazon, there have, however, been reports about unethical behaviour in regards to these technologies whether they were designed that way intentionally or not. Here are some of the reports that have raised ethical concerns against Amazon:

(a) An Oregon couple's privacy was violated unexpectedly when their Alexa device recorded a private conversation and sent it to a contact without their knowledge. Amazon confirmed the incident, blaming it on a bug caused by a word that sounded similar to "Alexa." Concerns have been raised about the reliance on smart home devices and the lack of privacy protection (Wolfson 2018).

(b) According to an ACLU trial, Amazon's facial recognition technology, Rekognition, incorrectly identified 28 members of the US Congress as people who had been arrested for crimes. The ACLU used the same technology that Amazon makes available to the public, creating a face database and search tool from 25,000 public arrest photos and comparing it to public photos of Congress. People of Colour made up 11 of the 28 misidentifications, even though they make up only 20% of Congress. This has raised concerns about racial bias and potential law enforcement abuse. Amazon countered that the results could be improved by raising the confidence level. They also advised customers to set the confidence threshold for facial recognition to 95% or higher when using it for law enforcement purposes (Levin 2018).

(c) Amazon has come under fire for the conditions in its fulfilment centres, where employees must face strenuous requirements and adhere to stringent productivity goals. A review of one Baltimore location showed that hundreds of workers were let go during the 2017-2018 period for not meeting their targets. Automated systems employed by Amazon to evaluate each employee's productivity have caused some to worry that the company treats its personnel like robots. Amazon has said that staff members can get retrained and there is an appeals procedure in place for those dismissed (Lecher 2019).

(d) Amazon-owned Ring video doorbells are gaining popularity and enabling a comprehensive surveillance system. Over 1,800 law enforcement agencies have been granted warrantless access to Ring camera content. These cameras are indiscriminate, capturing everyone, including children, and have the potential to create class and racial disparities. Concerns have been raised about the use of facial recognition and other forms of machine learning on the content. Amazon and law enforcement must be more open and accountable about the data they collect and use (Bridges 2021).

According to Philomin and Halliman (2022), responsible AI at Amazon encompasses six core components which are:

- Fairness and bias - It is critical to design AI systems in such a way that discrimination based on gender, race, ethnicity, religion, or any other attributed characteristic is avoided.
- Explainability - AI systems must be open and transparent about their functionality so that users can understand the reasoning behind their decisions and have faith in their dependability.
- Privacy and security - AI systems should ensure that sensitive data is kept secure and not exposed to theft, disclosure, or improper use.
- Robustness - AI systems must be designed to function reliably in a variety of situations, such as those involving anomalous inputs or external elements.
- Governance - Ensuring that AI systems are developed and used in a moral, legal, and permissible manner.
- Transparency – Stakeholders must have access to clear and precise information about AI systems; including the system's operational aspects, how decisions are made, and the potential impact on various groups of people.

Amazon has launched AWS AI service cards, which are a form of responsible AI documentation that provides customers with a comprehensive tool on the intended use cases, limitations, responsible AI design choices, deployment and performance optimization (Philomin and Halliman 2022). According to Amazon (2023), they work with various universities and organizations, including UC Berkeley, MIT, and the OECD AI working groups, to promote responsible use of AI. They offer grants, scholarships, and collaborations to encourage research and increase accessibility to machine learning skills training. For instance, they have the Amazon Research Awards and Fairness in AI Grants program, as well as the AI & ML Scholarship program, and work with groups like Girls in Tech and the National Society of Black Engineers through the We Power Tech initiative to cultivate future leaders in the field.

4.4.5 Facebook (Meta)

According to Hall (2023), Facebook is an American online social networking service that is owned by parent company Meta Platforms. Facebook was founded in 2004 and has grown to become the world's largest social network, with nearly three billion active users as of 2021. Instagram, Messenger, and WhatsApp are among the other services owned by Meta Platforms which have more than one billion active users each making it the four biggest social media platforms owned by Meta (Dixon 2023). The name change to Meta as a parent company was to emphasize their focus on the "metaverse", in which users interact in virtual reality. Facebook is furthering the development of artificial intelligence through both fundamental and applied research in an open environment in partnership with the public (Meta 2023).

Facebook makes use of AI in several ways such as ranking posts in the newsfeed, content moderation (combating hate speech and misinformation), and marketplace powered by AI.

- News feed ranking - Designing a ranking system for billions of people with varied interests and content is a complex task. Machine learning (ML) is essential to ensure people do not get flooded with irrelevant or overly promotional content. Facebook uses ML to make content personally relevant for each person. This system is powered by cutting-edge ML such as multitask learning, neural networks, embeddings, and offline learning systems (Lada et al. 2021).
- Marketplace – Facebook marketplace uses AI to make the experience smoother for both buyers and sellers. They have product index and content retrieval systems built using AI-based computer vision and Natural Language Processing (NLP) platforms. Buyers can find visually similar products and have listings translated. Sellers can benefit from autosuggest categories and pricing, plus a tool to enhance product images (Zheng et al. 2018).
- Content moderation - AI systems have improved substantially in their ability to detect violating content in comments. This progress was enabled by better training data, features, and models that consider the context of posts and other details to better understand language. This evolutionary advancement has

made it possible to detect inappropriate comments with greater accuracy (Schroepfer 2021).

As much as Facebook is developing better AI systems, there have been numerous reports about concerns regarding the AI systems. Here are some of the news reports:

(a) Facebook's experiment with two AI chatbots was stopped after they created a language only known to them. The bots were negotiating items such as hats, balls, and books and developed their language to simplify the process. Ultimately, the research was stopped as the goal was for bots to communicate with humans (Griffin 2017).

(b) Facebook apologized after its AI mislabelled a video of Black men with the term "primates", highlighting the persistent issue of AI tools exhibiting bias. Facebook has deactivated its topic recommendation feature due to an "unacceptable error." The company is investigating to determine the cause and has apologised to those who were exposed to unacceptable suggestions. To stop similar issues from happening in the future, they are making enhancements to their artificial intelligence (Lyons 2021).

(c) A 2018 internal report presented to Facebook executives showed the company was aware its product, especially its recommendation engine, was driving divisiveness and polarization. Despite this, Facebook executives ignored these findings and shifted focus away from the issue. In response to the report, Facebook states it has gained a greater understanding of how to reduce the presence of damaging content and has enhanced its protocols and procedures to control it since 2016. Additionally, the company has allocated money for independent research on polarization (Statt 2020).

Facebook acknowledges that there are challenges when it comes to AI systems at Facebook but is determined to avert these challenges through responsible AI. Facebook has thus set up a Responsible AI (RAI) group within its AI organization to oversee the development and assessment of methods to ensure that its machine learning systems are both deployed and used appropriately. Much like its investment in a distinct Privacy group and Integrity group, the RAI team is a cross-functional effort

to further the aim of making AI at Facebook beneficial for people and the world. The team collaborates often with external specialists and regulators to endorse responsible AI practices (Pesenti 2021). Facebook has developed five AI principles influenced by the OECD AI ethics recommendations (Pesenti 2021);

- Privacy and Security
- Fairness and Inclusion
- Robustness and Safety
- Transparency and Control
- Accountability and Governance

Facebook emphasizes the need for collaboration between various stakeholders in the tech industry, the research community, policymakers, and advocacy groups to establish standards and best practices for AI governance, impact assessment, fairness, privacy, robustness, and transparency. The company is investing in collaborative research projects, policy prototyping, academic research on AI ethics, and participation in cross-industry and cross-civil society multistakeholder forums. Additionally, Facebook has an integrated user research practice that prioritizes the needs of people using its products. The company aims to contribute to the development of Responsible AI that leads to a safer, fairer, and more prosperous society (Pesenti 2021).

4.4.6 OpenAI

OpenAI is a company that specializes in researching and utilizing artificial intelligence. Their mission is to ensure that AI systems that are more intelligent than humans can be beneficial to humankind. Deep learning is a technology that OpenAI uses to create generative models. This involves providing an AI system with a vast amount of data to carry out specific tasks (OpenAI 2023). There are three AI products OpenAI has developed currently, namely, ChatGPT, DALL·E 2, and Whisper.

- DALL·E 2 – DALL·E 2 can create unique, lifelike visuals from text descriptions, as well as blend concepts, characteristics, and styles. DALL·E was unveiled by OpenAI in January 2021. A year later, the organization launched its most advanced system, DALL·E 2, which provides four times more realistic and accurate images with higher resolution (OpenAI 2023).

- ChatGPT - ChatGPT can follow commands given to it in a prompt and provide a comprehensive response. It engages in conversations in a natural manner and can answer additional questions, correct errors, refute wrong statements and decline improper requests. ChatGPT is modified from a model in the GPT-3.5 series, which was completed at the beginning of 2022. GPT-4 has become more inventive and cooperative than ever, allowing it to produce, revise, and go over creative and technical writing tasks with its users, such as creating songs, scripting movies, or learning a user's writing technique (OpenAI 2022; OpenAI 2023).
- Whisper - Whisper is a powerful speech recognition model which offers transcription, recognition and translation of multiple languages. It provides transcription in various languages and also can translate them into English. Developers can now use Whisper's high accuracy and user-friendly interface to add voice user interfaces to a wider range of applications (OpenAI 2023).

Although OpenAI has developed powerful tools to complete various tasks, there are also limitations when it comes to AI. The limitations of ChatGPT may be to write incorrect information but make it sound logical. This is referred to as “hallucinations.” ChatGPT 3.5 is a free version and the information is limited to 21 September 2021, meaning the information is outdated and cannot produce current information (OpenAI 2023). However, the ChatGPT 4 is the paid version and has internet access with current information. The generative AI tools that OpenAI develops are very popular and have pushed the boundaries of generative AI. There are mixed reactions to OpenAI as some embrace the technology and others see it as a threat. However, there were news reports that have highlighted the concerns of generative AI, especially OpenAI.

(a) There are plagiarism concerns in educational institutions as ChatGPT can be prompted to write essays and even pass bar exams in law. While it may take hours or even days to write an essay, ChatGPT can do it in a matter of seconds. Some of the other things ChatGPT is capable of doing are generating stories, sermons, song lyrics, research paper abstracts, and even coding a website (Horn and Curtis 2023; Kelly 2023; Miles 2023).

(b) Italy has temporarily blocked the usage of OpenAI's ChatGPT chatbot due to privacy issues, leading to a probe by the nation's data protection agency.

Several other countries such as China, Iran, North Korea and Russia have also barred AI-powered technology with the European Consumer Organisation (BEUC) demanding greater public oversight (McCallum 2023; Khatsenkova 2023).

(c) OpenAI's DALL-E provides users with the ability to create AI-generated artwork through text. Questions remain on the copyright of such art, particularly when being sold. OpenAI allows users to monetize creations, yet there may be issues related to copyrighted data used by the AI. DALL-E has the potential to be a threat to the creative process and affect the jobs of visual artists, graphic designers, and illustrators (Blain 2022; Pethokoukis 2022; Eisikovits and Stubbs 2023). Another similar text-to-image AI is Midjourney, where Jason Allen won a fine arts competition and the judges could not tell that it was AI generated which sparked debate about AI and art (Harwell 2022).

In light of the AI concerns regarding ChatGPT and DALL-E, OpenAI admits that AI tools have risks. OpenAI's Chief Technology Officer Mira Murati states: "AI systems are becoming a part of everyday life. The key is to ensure that these machines are aligned with human intentions and values" (OpenAI 2023). According to OpenAI (2023), they are dedicated to producing AI tools that are both safe and beneficial. Before making any new AI systems available, they run extensive tests, draw on external specialists, and install surveillance and safety systems. OpenAI also believes that legislation is necessary to ensure that safety protocols are adopted, and they are actively working with governments on this. In addition, they learn from real-world applications to augment security and adjust their systems based on user feedback. OpenAI is particularly focused on safeguarding children and has put in place measures to prevent the misuse of their technology. They take privacy seriously and are committed to improving the accuracy of their data. OpenAI is committed to conducting ongoing research and engaging with stakeholders to address the safety issues related to AI and involve them in the evolution of AI technology (OpenAI, 2023). Although OpenAI states that they collaborate with policymakers to ensure AI trust and safety they do not mention who those policymakers are. They also seem to have not adopted or drafted their own responsible AI principles.

4.4.7 Baidu

According to Scott (2023), Baidu is the biggest search engine provider in China. It offers services which are comparable to those of Google but concentrate on the Chinese market, where it holds the majority of the search market share. Baidu abides by Chinese regulations and censors search results and other content accordingly. Google is not accessible from mainland China due to the nation's Great Firewall. The name Baidu means “hundreds of times” which signifies a determined pursuit of perfection. It originates from a poem composed in the Song Dynasty of China, over 800 years ago (Baidu USA 2022).

Baidu first employed AI technology in 2010, creating a simpler method of searching the web. The "Baidu Brain" core AI engine allowed the company to create a complete AI stack, which includes AI chips, a deep learning framework, natural language processing, a knowledge graph, speech recognition, computer vision, augmented reality, and an open AI platform. As a result, Baidu has implemented its AI into products, services, and unique applications (Baidu, 2023). Some of the AI products and services by Baidu are as follows;

- Self-driving cars – Baidu is developing autonomous driving technology through their Apollo program. Apollo offers a broad, reliable, and secure solution for enabling autonomous vehicle features and capabilities. The models are trained from real-world and simulated data to improve performance using a combination of their technologies (Marr 2018; Baidu 2023)
- DuerOS smart assistant - Baidu has a large data set which gives its voice assistant, DuerOS, an advantage over competitors like Alexa, Siri, and Cortana. To accelerate innovation, Baidu has partnered with over 130 tech firms, and DuerOS is now used in a variety of appliances like fridges, TVs, and speakers. DuerOS has better prospects for global expansion compared to Alexa, Cortana, and Echo, which are designed with American households in mind (Marr 2018; Baidu 2023).
- Ernie Bot - Ernie Bot is a large language model developed by Baidu. It is an alternative to ChatGPT in China which is blocked in China. Ernie Bot can solve math questions, write copy, answer Chinese literature questions, and generate multimedia responses. It is currently only available to select Chinese creators and its integration into Baidu's other products is still unclear (Yang 2023).

When it comes to the unethical use of AI in China, there is very limited information. Though there have been a few AI controversies in the country, Chinese researchers have centred their criticism on foreign tech corporations rather than domestic ones (Zhu 2022). Another major societal issue is the monopoly of AI as the Chinese government announced its first four national champions of AI: Baidu, Alibaba, Tencent, and iFlytek. These companies have been chosen to lead the country in developing advanced technologies, such as voice recognition and autonomous vehicles. This is part of the government's strategy to become a global leader in tech (Jing and Dai 2017). The critique is that the Chinese government has allowed these businesses to become monopolies, leading to benefits being unequally distributed and an increase in the gap between social classes (Zhu 2022).

There are no AI regulations (responsible AI principles) from individual companies such as Baidu but the government does have measures for regulation. The Cyberspace Administration of China (CAC) has published draft laws governing the development of generative AI products. These regulations underline the need for content to match socialist ideas and prohibit the dissemination of misleading information. Companies must also ensure that the data used to train AI models does not discriminate against people based on their ethnicity, race, or gender (Kharpal 2023; CAC 2023).

The rapid development and experimentation of AI technologies have raised concerns and sparked debates about the ethical implications of their widespread adoption. As AI continues to advance at an unprecedented pace, there are growing calls for a pause on AI development and experimentation to carefully consider the ethical implications and potential risks associated with these technologies (Future of Life 2023). The Future of Life Institute published an open letter for a six-month pause on giant AI experiments more powerful than GPT-4 has over 2000 signatories and some of the prominent signatories are Elon Musk (CEO of SpaceX, Tesla and Twitter), Yuval Noah Harari (Author and Professor), Steve Wozniak (Co-founder of Apple), Jaan Tallinn (Co-Founder of Skype), Tristan Harris (Executive Director of Centre for Humane Technology) amongst other scholars, tech entrepreneurs, and scientists (Future of Life, 2023). The first reference in the open letter is the article *On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?* by Bender et al. (2021). The

authors of the “Stochastic Parrots” responded to the open letter, firstly, agreeing with some of the suggestions such as using provenance and watermarking systems to identify real versus synthetic media. However, they argue that the letter focuses too much on hypothetical risks of "powerful digital minds" and "human-competitive intelligence," which they view as fearmongering and hype. They critique the letter for encouraging long-termism, which they say ignores present AI harms. They advocate for transparency, disclosure, and responsibility from digital corporations to protect individuals. They also believe that individuals who would be most affected by AI should be included in choices about its implementation. Their goal is to create machines that work for people and to regulate companies to preserve the rights and interests of individuals (Gebru et al. 2023). UNESCO has also responded to the six-month hiatus of AI by urging countries to implement its recommendation on the Ethics of AI due to the concerns raised by tech workers and the ethical issues associated with AI. The Recommendation, unanimously adopted by 193 Member States, is the first global framework for ethical AI and provides values, principles, and policy recommendations. It emphasizes the inadequacy of industry self-regulation and includes tools for ensuring AI developments comply with the rule of law and promote accountability and redressal mechanisms (UNESCO 2023).

The question of who should regulate AI, whether it should be left to self-regulation by the corporate entities developing and deploying AI or whether government intervention is necessary, is a contentious issue that requires thorough examination. The following section highlights the multifaceted nature of the ethical concerns related to AI and the ongoing debates surrounding the need for regulation in the field.

4.5 AI CORPORATE SELF-REGULATION OR GOVERNMENT REGULATION?

In today's global landscape, there is ongoing discussion among industry experts, government officials, academics, and civil society members about the necessity of legal regulatory frameworks for various technologies. The debate extends to whether ethical or technical approaches are adequate in certain cases. Even if consensus is reached on these questions, another important aspect to consider is whether our current ethical and regulatory frameworks adequately address the far-reaching impact

of these technologies (Cath 2018). Three types of regulations will be discussed namely; self-regulation, government regulation, and co-regulation.

4.5.1 Self-regulation

Self-regulation is regarded as “soft law.” In other words, soft law is a non-binding instrument such as guidelines, codes of conduct, and best practices. The previous section detailed the responsible AI principles drafted by tech companies which can be regarded as soft law. These AI principles by tech companies have become increasingly important in the current environment of rapidly advancing technology, where traditional law-making is unable to keep up. Soft law may not be legally enforceable, but it still carries practical implications and is often used with hard law to help national actors understand and apply legal standards. Soft law is seen as a key component of governance frameworks in managing the rapid evolution of technology and can be just as effective as hard law in ensuring transparency and accountability of AI systems (Varošanec 2022). Varošanec (2022) argues that the term "regulation" often elicits alarm since it implies extra norms to follow, a potential impediment to innovation and growth, and questions about the sufficiency of laws in handling the complex nature of AI. However, it is critical to acknowledge that regulation, when tailored to promote investments and foster scientific growth of AI systems through its standards, can have a positive impact. Such legislation can assist developers in navigating hurdles and ensuring that their AI systems are built using strategies that balance explainability and efficiency, encouraging responsible and ethical AI development. It is critical to determine the most effective tools to ensure that AI systems are built ethically.

Tech companies should follow the law if adequate regulation is already in place. In the absence of updated regulations specifically tailored to the rapid advancements of AI, businesses often find themselves in a challenging position. While existing regulations may not fully encompass the ethical implications of AI systems, businesses are faced with the responsibility of ensuring that their AI technologies are developed and used ethically. In this context, self-regulation becomes a default approach for many businesses as they strive to uphold ethical standards. However, in instances where regulation is inadequate, Ferretti (2021) argues that corporations should prioritize

supporting governments in developing proper regulatory frameworks as an ethical obligation, rather than relying entirely on self-regulation.

Proponents of self-regulation often argue that they are the experts of AI and are therefore in the best position to self-regulate. However, self-regulation can be elusive to the public, as it often lacks transparency, accountability, and public approval. There is a potential danger that companies will be allowed to create their regulations without much visibility of the process, which may leave out important details that could be beneficial to citizens, but too costly for the companies (Varošanec 2022). The sole intention of the business is to make a profit and it is often at the expense of citizens. voluntary self-regulation is unreliable since market forces can discourage businesses from following their ethical standards unless proper surveillance is in place and there are repercussions for not meeting standards.

4.5.2 Government regulation

Government regulation is often referred to as “hard law” which is binding and has repercussions. The tasks of any state concerning AI technologies should involve ensuring their responsible use through regulations, guidelines, and accountability measures, as well as protecting the rights of citizens including privacy, security, autonomy, and non-discrimination. Transparency, fairness, and collaboration among stakeholders should be prioritized to align AI technologies with societal values and interests (Minbaleev et al. 2021). The power of the law can be used to immediately impose specified criteria and prohibit any behaviour that does not comply with those standards through government regulation. This can be problematic because the regulator must rely on information provided by those being regulated, which might lead to them being "captured" by those same people. Furthermore, regulations developed from this sort of regulation can be unnecessarily complex and rigid, making compliance difficult (Varošanec 2022). While governments may be more legitimate, stable, and efficient than private agents at achieving a just society, they can also fail to create a just society. Abraham Singer's concept of “justice failure” refers to the real-world, non-ideal circumstances in which governments fail to create a just society. His argument challenges the idea that markets should focus on efficiency and governments on justice, by suggesting that justice failure can lead to suboptimal

fairness in welfare states, as seen in authoritarian, weak and strong democracies. The inability to secure public trust and regulation, especially at the global level, further exacerbates the issue (Singer 2018; Ferretti 2021).

4.5.3 Co-regulation

According to Varošanec (2022), co-regulation is a process that appears similar to self-regulation, but the government has the ultimate authority to approve any soft-law instruments that have been developed per applicable laws. This allows private actors to be a part of the regulation of the industry, while also ensuring that the regulations adhere to legal standards. Co-regulation combines the advantages of both self-regulation and standard legislation. It provides cost-effective and flexible standards with meaningful protection and the option to switch to standard legislation if necessary. Transparency is a key component, enabling the best outcomes for all interests (Varošanec 2022). Though private actors can contribute to justice in AI, their efforts must be combined with government action for the best results. Voluntary standards are not enough to ensure just outcomes, as private actors are not always in the best position to secure legitimate standards, stable compliance, and collective coordination. Therefore, they should focus on political action and work together with governments to ensure social justice (Ferretti 2021).

4.6 CONCLUSION

This chapter has highlighted the discussions on the emergence of AI ethics and why there is a need for AI ethics. Diverse stakeholders disagree on the types and degree of governance that are acceptable for AI, which encompasses a wide range of technologies that span multiple industries. Some people advocate for industry or corporate self-regulation. They often argue that governments lack the adaptability or understanding required to adequately regulate, or that hasty regulation will stifle competition and innovation. AI has a revolutionary potential and major societal implications, there has been great debate over the ideals and principles that should guide its development and deployment. Concerns about how AI can endanger human workers' jobs, be abused by evildoers, dodge accountability, or unintentionally propagate bias and degrade justice have dominated recent scientific literature and media coverage. Ai has both utopian and dystopian perspectives, these extremes need to be critically analysed but policy needs to take centre stage to consider human dignity and ecology.

This chapter has discussed the global landscape of AI ethics. A lot of research has been undertaken to analyse AI ethical documents and gain a global perspective. In essence, the studies' major purpose and focus has been to examine the extent to which a global consensus on AI ethics is taking place. In regards to participatory processes, the public sector and NGOs have more public participation than the private sector. A broad public engagement is vital because it can impact how an AI ethics debate is portrayed. A more diversified set of opinions, for example, may result in a broader and deeper assessment of AI ethics issues. Closed participation methods may reflect an "expert" approach that relies on a small group of people to debate AI ethical issues, which may be restrictive. Private sector documents focus on resolving ethical issues related to clients/customers. Public sector documents emphasize economic growth and joblessness, whereas NGO documents consider a range of ethical matters which receive less attention from other sectors. Studies indicate that the public and private sectors are striving to address the ethical issues of AI, though the points of emphasis differ. However, the lack of representation from certain geopolitical areas, such as Africa, South and Central America, and Central Asia, reveals an inequality in the worldwide dialogue. Most of the AI ethics documents have been drafted by the public sector and intergovernmental bodies such as the OECD, G7, G20, United

Nations, Council of Europe, European Union, and African Union. The OECD is an international organisation that has over 100 member countries to work on issues of global importance. They drafted the OECD AI principles, and although it is not legally binding to member countries it provides guidelines. The OECD AI principles emphasise: inclusive growth, sustainable development and well-being; human-centred values and fairness; transparency and explainability; robustness, security and safety; and accountability. The G7 is a group of seven wealthy Western nations, that includes the United States, the United Kingdom, Canada, France, Germany, Italy, Japan, and the European Union. The AI principles of the G7 emphasise the significance of human control and human rights. The G7 understands that AI is a disruptive technology that will soon have an impact on all parts of life, creating new opportunities. That is why they seek to build worldwide expertise to understand and predict the repercussions. The G20 is a group of 20 countries that collectively account for approximately 85% of global GDP 75% of global trade and two-thirds of the world population. The OECD AI principles were endorsed by the G20 leaders and committed to a human-centred approach to AI. The United Nations through their body UNESCO published the draft *Recommendation on the Ethics of Artificial Intelligence* which was adopted by 193 Member States making it the first global framework for ethical AI. The European Union Commission has put forth a regulation (EU AI ACT) that deals with the potential risks of AI, allowing the EU to have a leading role in the global arena. Another major development in the European Union regarding digital rights and privacy is the General Data Protection Regulation (GDPR) which is a strict oversight institution. The African Union through its body the African Commission on Human and Peoples' Rights (ACHPR) adopted resolution 473 advocates for a study of how AI and other new technologies impact human and peoples' rights in Africa with an emphasis on African values and ethics such as *Ubuntu*.

This chapter has discussed major tech companies' development of AI, the limitations of their AI product and services and policies. The tech companies under discussion are Google, Microsoft, IBM, Amazon, Facebook (Meta), OpenAI, Apple, and Baidu. There are more tech companies and start-ups but the focus is on the major ones as the scope does not allow enlisting more companies. What these tech companies have in common is the race to develop advanced AI products and services from virtual

assistance, generative AI, and autonomous vehicles ahead of regulations. They have invested in AI and machine learning research and development to become leaders in the field. These tech companies also have limitations in their AI products and services that have ethical risks. There are AI principles drafted by the companies on their websites in how they practice responsible AI. There has been an open letter published for a six-month pause on giant AI experiments more powerful than GPT-4 signed by over 2000 people including prominent figures. The open letter is concerned that AI products and services especially generative AI are being deployed without considering the readiness of society and the product itself. The critique of the open letter is that it focuses more on the distant future about hypothetical cases of “superintelligence” without mentioning how AI impacts society currently. The emphasis in the six-month hiatus of AI development is the implementation of AI principles that have already been adopted by countries.

There are three approaches to regulation namely, self-regulation, government regulation, and co-regulation. Self-regulation is regarded as soft law, which includes guidelines, codes of conduct and best practices. It is becoming increasingly important in the fast-advancing technology landscape. Though soft law is non-binding, it carries practical implications, is often used with hard law and helps national actors understand legal standards. Companies should prioritize supporting governments in developing proper regulatory frameworks as an ethical obligation in cases where existing regulations are inadequate, rather than self-regulating AI technologies. Government regulation is referred to as hard law which is binding and has repercussions. Government regulation should ensure the responsible use of AI technologies, protect citizens' rights, and prioritize transparency, fairness, and collaboration. The challenge with government regulation is that the government can fail to create a just society and have regulations that are difficult to achieve. Co-regulation is a more suitable option as the best of both worlds can be utilised to have better regulations

The following Chapter 5 examines how *Ubuntu* ethics can provide unique perspectives and insights into the ethical considerations surrounding the development, deployment, and use of AI technologies in African societies. Chapter 5 will also show how ethical frameworks informed by *Ubuntu* can guide decision-making and policy formulation in the rapidly evolving field of AI adoption in Africa.

CHAPTER 5

UBUNTU ETHICS OF TECHNOLOGY

5.1 INTRODUCTION

This Chapter 5 examines how *Ubuntu* ethics can provide unique perspectives and insights into the ethical considerations surrounding the development, deployment, and use of AI technologies in African societies. Chapter 5 will also show how ethical frameworks informed by *Ubuntu* can guide decision-making and policy formulation in the rapidly evolving field of AI adoption in Africa. In the previous chapter 4, the global landscape of AI ethics has shown that there is a lack of representation from geopolitical areas such as Africa, South and Central America, and Central Asia in the AI discourse. This chapter will critically discuss the African perspective of AI as well as critique the notion of a global perspective. This chapter will also examine the state of AI policy and regulation in South Africa as it is crucial in how South Africa positions itself for the opportunities and challenges of AI. This chapter investigates the intricate relationship of power, technology, and development in the African context, with a particular emphasis on emerging technologies and their implications for society. It poses critical concerns about the nature of development, the role of power dynamics, and the potential repercussions of technological breakthroughs. Chapter 2 has discussed the impact of the first three Industrial Revolutions on the African continent and concluded that they exploited, marginalised, dispossessed, and subjugated Africa. It has been argued in Chapter 2 that the 4IR may continue to exploit Africa like the three previous Industrial Revolutions and that Africa should harness the power of AI to compete more effectively in the global economy. Chapter 4 has discussed the major companies that develop AI technologies and there is not even one company from Africa or the global south. This chapter critically discusses the development of AI technologies by Western companies and questions the development and deployment as part of coloniality or Westernization. Chapter 3 deconstructs what it means to be human as throughout history some were considered more human than others, and others sub-human (i.e., Africans). Chapter 1 has argued that Africans had their way of life which included the development of ancient technologies and African indigenous knowledge systems. Chapter 3 also discusses what it means to be a human in the context of emergent technologies. It has to be emphasised that emerging technologies have both the ability to empower and disempower individuals and communities. While advancements in technology enable the potential for economic growth, better life, and improved access to information and communication; they can also perpetuate existing power imbalances and marginalize specific demographics. Understanding the intricate relationship of power, technology, and development in the African context, an alternative approach to AI ethics is necessary. This study proposes a holistic *Ubuntu* AI ethics approach which includes humanity, spirituality, and the environment.

5.2 AFRICAN PERSPECTIVES OF AI ETHICS

In the previous chapter 4 on the global landscape of AI ethics, it was noted that there is a lack of representation when it comes to Africa in the discourse of AI ethics which reflects the power imbalance of the AI ethical discourse as more economically affluent countries are driving the discourse (Jobin et al. 2019). Other regions are also not represented such as South and Central America, and Central Asia but this chapter will particularly focus on Africa. This raises critical questions about the global AI ethics landscape: what are the primary reasons for the lack of representation of Africa in the AI ethical discourse? Are there any structural barriers to the exclusion of Africa from participating in the discourse? What effect does the underrepresentation of Africa have on the diversity of perspectives and experiences brought to the AI ethical debate? What biases might result from this lack of representation? What is the impact of the unequal representation of nations in the international AI ethics discussion on the capacity of less economically developed countries to shape AI policy and governance? What potential global implications could arise from this disparity in terms of AI development and implementation?

In this section, the exclusion of Africa in the global AI ethics discourse will be critically discussed. How the global landscape of AI ethics embeds Western ethics and its link with universalism will also be discussed. Lastly, this section will deliberate on the challenges of AI ethics in Africa as Africa is diverse in ethnicities and languages.

5.2.1 Exclusion of Africa in the global AI ethics discourse

According to Arakpogun et al. (2021:375), AI has become an important topic of discussion for academics and the public, as it is disrupting industries and daily life. Governments and experts are trying to understand its effects and how to promote its development. However, there is a gap between those with the development and deployment power of AI and those without, which could lead to more inequality between global north and global south countries. It is not only the development and deployment of AI but also a global north and global south gap regarding the development of AI ethics and regulations globally. Gwagwa et al. (2020) argue that the influence of developed countries in developing AI policies and strategies is embedded in coloniality. This is in part because the majority of the AI policies and

strategies that are available online emanate from the global north which implies that countries in the global south are excluded from the discussion of what constitutes ethical AI. Brokensha et al. (2023:6) argue that is not only the presence of the global south that is excluded but also their indigenous knowledge systems and values. Hogarth (2018) suggests that AI superpowers are controlling AI-related policies and regulations without taking into account the specific circumstances of African nations. He refers to this phenomenon as "AI nationalism". An example is that the government of France held an international meeting, the Global Forum of AI for Humanity, in late 2019. Unfortunately, the event lacked the voices of the global south such as Africa, Latin America, and Asia (except Japan) (Gwagwa et al. 2020:16).

5.2.2 Western AI ethics and universalism

The notion of global AI ethics is problematic as the previous section has alluded to the exclusion of global southern countries. Another aspect is that global AI ethics disguises Western ethical lenses as universalism. The contemporary AI ethics literature is mostly non-empirical, developed in the Global North, and viewed in a universal way (Ormond 2023:1). According to Brokensha et al. (2023), the discussions about ethics and AI in the current literature commonly use two approaches: utilitarianism and deontology which are from a Western perspective. Utilitarianism is a normative ethics and a form of consequentialism. It is a system of ethics that views actions as being evaluated based on their consequences. It is a response to the question of what a person should do, which is to act in a way that maximizes pleasure and minimizes pain (West and Duigman 2023). Deontological ethics emphasizes the duty of action, focusing on its characteristics rather than the outcome, recognizing moral obligation regardless of consequences (Britannica, 2023). When discussing AI-enabled robotics with utilitarianism and deontology; individuals who utilize utilitarianism evaluate a robot's actions or behaviours based on the results of those actions or behaviours, while those who use a deontological approach disregard the consequences and focus on a robot's intentions (Brokensha et al. 2023). Between utilitarianism and deontology, utilizing utilitarianism as a framework for examining ethics and artificial intelligence is still popular, as the principles that underlie it, such as accountability and privacy, lend themselves to technical solutions (Brokensha et al. 2023). In his book chapter *African Reasons Why Artificial Intelligence Should Not*

Maximize Utility (2021), Thaddeus Metz mentions why AI programmers and ethicists are drawn to utilitarianism due to its quantifiable nature, which makes it amenable to coding. Utilitarianism posits that all subjective feelings of well-being or distress can be represented by real numbers. This calculation of "pleasure versus pain" is difficult for humans, but can be readily calculated by AI (Metz 2021). However, African philosophy offers strong evidence that utilitarianism has significant flaws. It is well-known that utilitarianism has difficulty dealing with human rights. African philosophy emphasizes that individuals possess an inherent dignity which should be respected, regardless of the source. Thus, a moral agent should not treat persons as a mere means to an end. A dignity-based ethic grants human rights which must be upheld, even if it may lead to a lesser amount of value (Metz 2021). Brokensha et al. (2023) attest that it is important to strive for the well-being of others from an African perspective; however, any progress that is made at the cost of others is contrary to maintaining human dignity.

The previous chapter 4 mentioned the role of international organisations that are drafting AI principles and regulations such as UNESCO, OECD, and even the EU; but the expert inputs are mostly Western “universal” and other perspectives of ethics (i.e., African ethics) are overlooked (Van Norren 2023). Ormond (2023) states that the field of AI ethics is dominated by the global north and is often universalistic assuming contexts are uniform across the globe. However, only a small amount of research has been conducted to investigate how AI ethics varies at the regional or national levels. This is in part because the understanding, implementation, and impact of AI differ between people with varying cultural, historical, political, socioeconomic, technological, and environmental backgrounds (Ormond 2023). The claims of universal AI ethics are flawed as they are unsubstantiated, assume that they can be objectively quantified and investigated, and are based on Western knowledge and values (Zembylas 2023). There is thus a call the move away from universalism and embrace diverse ethical lenses that are rooted in their contexts. It is critical to include more perspectives from the global south on AI ethics. This will not only assist in moving the field away from implicit universalism but will also contribute to the existing AI ethics literature by including non-Western lenses (Ormond 2023).

5.2.3 Challenges of AI ethics in Africa

One of the major issues in Africa when it comes to AI is that AI applications in Africa are not contextualized, do not address the continent's most pressing needs, cause cybersecurity risks, and do not embrace African ethics (Van Norren 2023). It has been alluded to in the previous sections that AI policies and regulations in the global landscape are dominated by Western ethics; Arakpogun et al. (2021) suggest that Africa should adopt a problem-driven approach regarding AI ethics. This would allow African countries to create AI policies based on local needs and circumstances, as opposed to a 'copy-paste' approach which has hindered development. This approach could assist African nations in formulating effective AI policies. Gaffley et al. (2022) attest that the incorporation of AI in African society necessitates a distinct African stance that considers and values African contexts, experiences, and values. This is necessary to avert potential damage to African communities. To do this, interdisciplinary knowledge creation and comprehension of AI with ethical values and human rights in Africa is vital. Brokensha et al. (2023) argue that Africa is home to 54 countries, about 1.4 billion people, 3000 ethnic groups, and 2000 languages, making it a highly diverse continent. A single, unified AI strategy would be both impractical and presumptuous due to this diversity. Additionally, a standard set of ethics guidelines would fail to recognize the importance of diverse voices in tackling the risks and benefits of AI. It would also ignore the ever-changing complex correlations of the continent. Metz (2021) problematizes it further that he disagrees that the values governing technology must be those held by society's majority. Everyone in a society may not share the same values. Another aspect of values is that values based on the majority in society are how history has shown us that the majority can be wrong, such as with slavery in the 19th century. Instead, Metz believes we can learn from the African ethical perspectives, as any philosophical tradition likely has something to offer. Eke and Ogoh (2022) assert that many cultures exist in Africa, but it is frequently oversimplified and treated as homogenous. This overlooks the various AI ethics and governance questions that come up. To adequately address these matters, African philosophical/ethical perspectives, including *Ubuntu*, must be taken into consideration. Otherwise, we would be disregarding African AI stories and ignoring possible moral principles that could positively affect the global AI ethics discourse.

5.3 PERCEPTIONS OF AI IN AFRICA

The previous section has deliberated on the perspectives of AI ethics in Africa vis-à-vis the global landscape of AI ethics. This section will deliberate on the perceptions of AI in Africa. How do Africans or the African continent perceive AI? How does Africa perceive AI to have an impact on the continent? These are some of the key questions this section will critically analyse. Perceptions of AI have sparked debates and there are a variety of opinions and influences of AI in different parts of the world. This section will delve into the number of studies done to quantify the perception of AI in Africa, and the potential benefits, risks, and opportunities will also be discussed. This section focuses on how AI has been perceived both as an opportunity for Africa to have economic and developmental growth or perpetuate existing challenges.

5.3.1 Perception of AI in Africa

It is quite difficult to measure the influences of AI perceptions on the African general public as it can come from different areas such as movies, social media, online media, traditional media (newspapers, TV, magazines), academic sources and individuals (Brokensha et al. 2023). Although there are no studies that have been conducted on the overall public perception of AI in Africa, there are a few studies that have been published for specific target groups.

According to Dias (2020), Viacom Global Insights South Africa surveyed people aged 18-49 within their online community to gain an understanding of how AI is perceived. Although the study does not mention the number of participants, results indicated that 50% of South Africans stated they were aware of what AI is. Additionally, 51% indicated that they were aware of AI, yet did not rely on it much, while 44% reported that they often use AI, particularly for digital assistants such as Hey Google and Siri. According to the study, South Africans have a mixed attitude towards the development of AI; 45% are excited while 44% feel both excited and scared. Younger people (18-24) are more optimistic about AI integration in school and work, with 77% expressing excitement, compared to those aged 45+ (65%) (Dias 2020). Another interesting insight from the study is that South Africans are intrigued by the potential of AI, but concerned about its impact on employment. Many fear it could cause job losses in manufacturing, finance and entertainment. They also worry that AI might make them lazy, replace humans and develop their minds (Dias 2020). Overall, there is a positive

perception as 73% see the potential of AI to increase human productivity, reduce errors, and make processes more efficient (Dias 2020).

Brokensha et al. (2023) state that studies and reports focusing on African perception of AI are limited to professional fields such as radiography, academic librarianship, the legal profession, journalism, and the accounting profession. 475 radiographers surveyed by Antwi and his team showed positivity towards AI, citing its benefits such as improved diagnosis, patient safety, and research, but had fears about inadequate training, data security, and job security. They were also worried about the potential for their core skills and roles to become obsolete (Antwi et al. 2021; Brokensha et al. 2023). Lund et al. (2020) found that academic librarians had a positive outlook towards AI across six continents including Africa, while Abayomi et al. (2021) reported that Nigerian librarians were wary of AI due to the fear of being replaced by machines. Despite this difference, both studies suggest that integrating AI could improve library operations and user satisfaction. Adeyoju (2018) acknowledges that AI may cause some anxiety for lawyers, yet it is being implemented in law firms in Kenya, Nigeria, South Africa, Tanzania, and Uganda to handle repetitive tasks such as legal research, data analysis, and statistical examination. Perceptions of the role of AI in journalism are varied. In South African news media, there is hesitancy due to anxiety about potential ethical issues and job losses (Munoriyarwa et al. 2023). Although some media outlets have used AI to monitor comments, the results have been unsatisfactory due to the general lack of accuracy and the tendency of AI to create “vague and flowery” content (News24 2020; Caboz 2021). Kamau and Ilamoya (2021) and Ahmed (2021) both explore the implications of AI on the accounting profession in Kenya and the financial technology ecosystems in Ghana, Kenya, Nigeria, and South Africa. Kamau and Ilamoya (2021) believe that AI is disruptive technology but it should not pose a threat to the basic tenets of accounting. Ahmed (2021) argues gender disparity in financial technologies limits women's access to financial services and resources and suggests that in such a context, AI applications may not be able to remove biases related to gender and race. The South African Institute of Professional Accountants (SAIPA) is examining the influence of AI-driven technologies on accounting, they admit that while some functions may be automated, accountants who are eager to broaden their horizons concerning AI will be in high demand (Moyo 2019; Small 2019). Although the survey by UNESCO in 2020 was not about the public perception of AI in

Africa AI capacity building in African countries, only 21 of the 32 African countries that answered the survey ranked AI development and usage as a top priority in their national development objectives (Gwagwa et al. 2021; Brokensha et al. 2023).

The African perception of AI is both positive and negative. It is positive because mundane tasks can be automated with limited human participation. It is negative because it may have an impact on job security. It is thus essential for professionals to upskill on AI-related technologies to remain relevant in the current times. The following subsection will deliberate on the potential benefits, risks, and opportunities of AI in Africa.

5.3.2 Potential Benefits of AI

Ade-Ibijola and Okonkwo (2023) state that AI has become a popular tech tool, yet many business leaders have difficulty measuring its rewards. Common benefits include quicker responses, saved time, medical breakthroughs and income (Gaffley et al. 2022); yet, users in Africa have difficulty understanding others like process automation, improved learning, and customer experience. The uncertainty of the benefits of AI could be a barrier to the adoption of AI (Ade-Ibijola and Okonkwo 2023). Arakpogun et al. (2021) attest that the benefits of AI could potentially improve socioeconomic growth, and increase tech-related employment, and quality of life with medical breakthroughs. These benefits, as well as increases in productivity, efficiency of processes, and profit, are already present in Africa. In regards to employment, a company called Samasource has recruited young people in Kenya and Uganda to “train” data to convey human intelligence to AI for major tech companies such as Google, Microsoft, and Yahoo (Arakpogun et al. 2021).

Okolo et al. (2023) argue that Africa may not be an AI superpower or it may take considerable effort to be one, but it should capitalize on their capabilities in software creation and research, investing in infrastructure, and ensuring that potential benefits outweigh the risks. Machine learning enhances massive dataset analysis and patterns, answering diverse questions and boosting economic efficiency. It can also assist people in comprehending environmental issues and encourage UN sustainable development goals, which will ultimately benefit society (Stahl et al. 2023). Some of the sustainable development goals include minimizing poverty and hunger, providing

a quality education for all, providing clean water and sanitation, affordable and clean energy, and promoting peace, justice, and stable institutions (Gwagwa et al. 20

Ruttkamp-Bloem (2023) argues that understanding the potential benefits of AI necessitates an epistemic just framework of AI ethics and both are inextricably linked. AI technologies have the potential to bring about significant change for many Africans. However, Africans require AI ethics awareness, sensitivity, and literacy to benefit from AI in the African context. In the context of smart cities, AI has numerous useful applications, such as leveraging its predictive powers to explore new development paths, water and risk management, assisting with fire detection, boosting security, and being employed in historic places. What remains critical is that there is equality in AI opportunities and that the services delivered are inclusive (Gaffley et al. 2022).

The following subsection will deliberate on the potential risks of AI in the African context.

5.3.3 Potential risks of AI

While there are significant benefits to be gained from AI in Africa, there are also multiple barriers and unforeseen risks that policymakers must address. These problems vary from socioeconomic inequalities caused by the digital divide and a lack of digital skills across a big part of Africa's population to the risks of automation and job losses that could affect multiple sectors (Arakpogun et al. 2021; Gaffley et al. 2022). In the global landscape of AI, there is uneven development and deployment of AI in the global south and global north. The global north is more resourced than the global south and it could lead to further inequalities (Arakpogun et al. 2021). Brokensha et al. (2023) argue that the challenge with the monopoly of tech companies such as Facebook, Google, Microsoft, and Amazon is that they can hamper African countries' efforts to create and implement their own AI technologies. If you cannot develop your technologies, you are at risk of being deployed technologies that are not contextual and there are also risks of exploitation. AI tech, mainly developed in the Global North, can lead to "allocative harms" in African contexts, such as decisions on bank loans or credit. Furthermore, facial recognition algorithms may disproportionately target or exclude people of colour (Gwagwa et al. 2020).

AI's potential to cause harm is great, as biased data can be used to reproduce existing socioeconomic inequalities. Powerful tech companies or governments may use it to violate human rights or further entrench their influence. A lack of regulation can lead to an uncontrolled expansion of AI, resulting in a greater risk of harm (Gwagwa et al. 2020). Brokensha et al. (2023) argue that solving bias by removing algorithmic bias related to race and gender may be seen as a simple technical solution, but it fails to account for the power imbalances, historical factors, and post-colonial contexts that contribute to biased algorithms. Furthermore, discrimination from AI systems often stems more from structural issues than from algorithmic biases. One of the major risks of AI-driven automation is job losses. Research is thus necessary to figure out the consequences of AI-driven automated systems on employment and access to training for the future of work (Gaffley et al. 2022).

Gaffley et al. (2022) state that inequality means that a single AI model will not work for everyone. On the one hand, AI can reduce inequality and on the other hand, AI can perpetuate discrimination, especially towards the vulnerable (i.e., women). Liability and human rights issues are a major concern, such as bias, exclusion, privacy and security. When AI bias or discrimination occurs, it raises questions about who is liable. More research is required to comprehend the broader human rights implications of AI in Africa, such as culture and the right to a healthy environment (Gaffley et al. 2022).

The following subsection will deliberate on the presented opportunities of AI in Africa against the backdrop of the potential benefits and risks.

5.3.4 Potential Opportunities of AI

One of the major opportunities of AI in Africa is for Africa to make use of the advantages AI can bring in terms of socioeconomic benefits, it is also essential that AI policies are established to stop any existing injustices and inequalities from being perpetuated (Brokensha et al. 2023). Arakpogun et al. (2021) state that, for Africa to avoid the missed opportunities of the three previous Industrial Revolutions governments must create a suitable atmosphere for AI start-ups to grow and help speed up the social and economic progress of Africa. Indeed, AI can potentially provide solutions to some of the most pressing issues in Africa, from poverty and education to healthcare and sustainability. This technology can democratise access

to advancements in productivity, allowing for higher levels of economic growth. In addition, AI is revolutionising how work is done, creating more efficient processes that will increase productivity, and improving the services provided by governments to citizens. This will also create new, high-value jobs in the region that will require technical skills, such as data scientists and AI engineers. AI can also be used to unlock the value of data, enhance cognitive processes, and improve predictive capabilities, which will help governments make better decisions (Access Partnership 2018).

One of the major challenges of AI that has been mentioned repeatedly is job loss. Arakpogun et al. (2021) state that one way to reduce the impact of automation on workers is to provide training and education to the existing workforce. Education systems should be adapted to meet the demands of the 4IR, and AI should be taught at all levels from primary to tertiary. If this is done across Africa, it will make people more aware of the potential of AI, increasing its uptake and allowing people to develop the skills they need to take advantage of future job opportunities. Coelckelbergh (2023) agrees that AI has the potential to bring about betterment for Africa and its citizens but the correct socio-economic conditions need to be set in place and the technology should be used responsibly and democratically. Gwagwa et al. (2020) attest that African policy responses at all levels are necessary to reap the benefits and mitigate the potential threats of AI. Such policies should be designed to create an inclusive AI ecosystem, taking into account the social implications, that are well-integrated with local realities. As much as AI may provide many opportunities in Africa, there are still fundamental structural issues that need to be addressed.

This section has deliberated on the Perceptions of AI in the African context based on the potential benefits, risks, and opportunities. AI has the potential to solve the most pressing challenges in Africa and could potentially improve socio-economic growth. There are also risks that the present socioeconomic inequalities could worsen and contribute to massive joblessness. Robust AI policies could mitigate the risks of AI on the one hand and strengthen the benefits of AI on the other hand.

The following section will critically discuss the concept of a decolonial AI.

5.4 COLONIALITY IN AI AND DECONIAL AI

The previous chapters have alluded to the impact of colonization through the first three previous Industrial Revolutions on Africans and the African continent. We are at another critical point in history with the development of emerging technologies in the 4IR such as AI and its impact on Africa. The essential concerns of AI in Africa are whether it will continue to entrench Western hegemony in the development and deployment of AI on the one hand, and the continued dominance of Western epistemologies on AI ethics on the other hand. This section will critically discuss what is meant by coloniality in AI. Adams (2021) refers to coloniality as the "Janus-face" which is a Greek deity with two faces, one looking backwards and another one looking forward. In this context, coloniality denotes the Janus-face of modernity and capitalism: colonialism is the driving force behind the interconnected ambitions of modernity and capitalism. This section thus discusses the coloniality of AI. This section will also discuss the concept of decolonial AI and the aspects that need to be taken into consideration when AI is designed to curb historic injustice.

5.4.1 Coloniality in AI

The main question in this subsection is how is AI colonial which warrants a decolonial lens. Mohamed et al. (2020: 665) make the following statement:

> Digital spaces—created by the Internet and the increasingly networked systems and devices we use—form digital territories that, like physical spaces, have the propensity to become sites of extraction and exploitation, and thus the sites of digital-territorial coloniality. Digital-structural coloniality also manifests, through the coloniality of power, the coloniality of power can be observed in digital structures in the form of socio-cultural imaginations, knowledge systems and ways of developing and using technology which are based on systems, institutions, and values which persist from the past and remain unquestioned in the present (Mohamed et al. 2020).

Technology as power influences decisions, behaviour, and connections are determined by data analysis using sophisticated statistics and forecasting models. At the centre of the power of AI is data. Milan and Treré (2019) assert that this data is informed by Western modernity and subsequently, global capitalism which are both continued historical processes that suppress and devalue knowledge as well as the

distinctive methods of knowing of the global south. Ricaurte (2019) states that epistemologies which focus on data can be seen as an expression of colonial power, involving the forceful imposition of ways of living, thinking and feeling which results in people being excluded from society, while negating the possibility of alternate perspectives and endangering life on the planet. The implementation of AI in predictive policing, algorithmic sentencing, facial recognition, resource allocation, surveillance, and hiring, all demonstrate a racializing and colonial perspective (Benjamin 2019; Zembylas 2023). Research in this domain has coined terms such as data colonialism and data capitalism; data can be regarded as a commodity, with its history of colonialism and capitalism. This notion emphasizes the continuous presence of data throughout history and its utilization for economic growth (Thatcher et al. 2016; Zuboff 2019). Mohamed et al. (2019) further develop the concept of data colonialism into algorithmic coloniality which describes how algorithms affect resource allocation, human behaviour, and discriminatory systems across societies. It also looks at how coloniality is manifested in algorithmic decision-making, such as the creation of labour markets and the alteration of geopolitical power dynamics and ethics discourse.

Examples of algorithmic coloniality compromise of the following but not limited to:

(a) When the issue of racial bias and the non-identification of Black faces by AI-driven facial recognition technology peaked in 2018, it was due to the work of Buolamwini and Gebru (2018).

(b) A Chinese facial recognition firm signed a deal with Zimbabwe's government, allowing them access to the nation's population registry to train their algorithms to better recognize Black faces. However, it was criticized for exploiting inadequate data protection laws in Zimbabwe (Ballim and Breckenridge 2018; Adams 2021).

(c) Cambridge Analytica was accused of “ethics dumping” for choosing Kenya and Nigeria to beta-test and develop algorithms for elections due to their weaker data protection laws. This led to interference with electoral processes and worked against social cohesion (Nyabola 2018). "Ethics dumping" involves companies sending their unethical research and activities to vulnerable and marginalized populations or low- and middle-income countries. This often follows the same routes of exploitation that were developed during colonialism (Mohamed et al. 2020).

(d) The use of algorithmic decision systems is becoming more and more prevalent within the United States of America's criminal justice system, even though there is a large amount of evidence that points to their many flaws, such as connecting criminal data to certain patterns of discriminatory policing (Richardson et al. 2019; Mohamed et al. 2020)

(e) Despite economic development and flexibility, AI successes have come at the cost of exploiting workers. Labelled data is often done remotely, with limited labour laws, resulting in low pay and abrupt dismissals. Moreover, workers experience psychological trauma from reading and viewing graphic content. This reveals a lack of consideration for labour rights and safety (Yuan 2018; Hao 2019; Rowe 2023).

(f) AI translation of African languages is limited due to a lack of data and resources. Languages from the Global South struggle to be understood by AI services such as Google Translate, Siri, and Alexa, as they require natural language processing (NLP). These languages are labelled "low-resourced" compared to their "high-resourced" counterparts like English, French, German, Spanish, and Chinese (Doumbouya et al. 2021; Ravindran 2023).

This subsection has elaborated on the coloniality in AI and also given some examples of how it operates. The following subsection will discuss the concept of decolonial AI.

5.4.2 Decolonial AI

The previous sections have deliberated that AI is mostly developed in the West and that in the global landscape of AI ethics, perspectives of ethics especially from the global south such as African ethical perspectives have been marginalised. The previous sections have also indicated that AI perpetuates coloniality regarding data colonialism and data capitalism. The main focus in this subsection is how AI can be decolonised in its design. Mohamed et al. (2020) state that fusing AI and decolonial theories provides us with the opportunity to gain new insights from the past to build a better future. By constructing a decolonial AI, it is possible to both improve the empirical foundation of AI and avoid any damaging algorithmic colonialism.

Cruz (2021) states that generally when technology and design do not work to disrupt the existing power dynamics that lead to social injustice, environmental destruction,

and other types of harm, they are reinforcing colonial values. Cruz (2021) suggests two ways to decolonize AI design; the first one is a top-down approach and the second is a bottom-up approach. The top-down approach is inspired by Hui (2016) and Ansari (2018) who propose decolonizing the thought processes of developers such as philosophers, engineers, designers, architects, and other central figures in the design process before attempting to create decolonial technologies and technical designs. Hui (2016) suggests a spiritual or intellectual enlightenment to achieve this, and Ansari (2018) suggests a theoretical enlightenment or liberation to achieve this. Both these top-down approaches do not take into consideration the realities of the marginalised, are excluded in the design process, and do not directly address coloniality (Cruz 2021).

The bottom-up approach seeks to decolonize and empower the AI developers and marginalised. Through a respectful exchange of verbal and non-verbal knowledge between the technical team and the partnering group (marginalised), they seek to achieve this goal through empowering design practices (Cruz 2021). Technical design can be empowering in the following ways: fostering sociotechnical inclusion; valuing cultural differences; nurturing qualitative relationships; sharing technical competencies; practicing investigative methodologies; promoting social and economic emancipation; cultivating political emancipation; and growing environmental awareness (Kleba and Cruz 2021).

Mohamed et al. (2020) propose three approaches for future A design based on historical and decolonial criticism namely; technical practice, reciprocal engagement, and renewing affective and political community. In regards to technical practice; decolonial AI is a self-reflective approach to AI design and deployment, recognizing power disparities and implicit value systems. Critical technical practices bridge AI the algorithm design gap, revealing assumptions and alternative methods. Five aspects are thus needed namely: algorithmic fairness, AI safety, equity, diversity, policy-making, and AI as a decolonizing instrument (Mohamed et al. 2020). In regards to reciprocal engagement; modern critical practice promotes reverse teaching and reciprocal exchange pedagogies (technicians being taught or learning from the marginalised groups), addressing colonial binarism and AI researchers' dominance in information and dataset selection, exemplifying decolonial science and reverse tutelage strategy (Mohamed et al. 2020). In regards to renewed affective and political

community; critical AI practice relies on political communities' ability to shape its usage, employing advanced technology and implementing mechanisms for dispute and reverse interventions. The decolonial imperative calls for a shift towards solidarity, decolonizing power, and supporting grassroots organizations to develop new forms of affective communities, intercultural communication, and demonstration of existing solidarity and alternative communities (Mohamed et al. 2020).

This subsection has deliberated on how AI can be decolonised in its design. The top-down approach is of the view that the thought processes of AI designers should be decolonised before developing technologies. However, this approach is vague as it is not clear how or where AI designers can be decolonised which places it within their own conscious. The limitation of this is that it does not take into consideration the realities of the marginalised who are excluded in the design process. The bottom-up approach emphasises collaboration between the AI designers and the marginalised. The AI design process includes learning from and with the marginalised to better understand their challenges. It is by taking into cognisance the context of the marginalised and the development of technologies that can uplift them to address algorithmic colonialism. The bottom-up approach is more suitable to address historic bias within AI technologies.

The following section will deliberate towards *Ubuntu* ethics of technology.

5.5 TOWARDS *UBUNTU* ETHICS OF TECHNOLOGY

The previous sections have argued in the African context, it would be appropriate to use an African ethical theory regarding the ethical implications of emerging technologies. African ethical perspectives such as *Ubuntu* have been excluded from the AI ethics global discourse. It has been argued that the global landscape of AI ethics is dominated by Western ethics which also embed universalism. The implication is that it assumes that countries in the world are impacted by emerging technologies the same way and a one-size-fits-all ethical approach is appropriate. Another implication of the global landscape of AI ethics is that it disregards the historical impact of the previous Industrial Revolutions on the African continent. The implication of disregarding history is that AI perpetuates coloniality concerning data colonialism and data capitalism. The potential benefits, opportunities, and risks of AI in Africa have

been discussed. The main goal of AI in Africa is for the benefits to outweigh the risks and for the risks to be mitigated with robust AI policies.

South Africa currently does not have a specific national AI regulation in place. It was only in January 2020, that the Presidential Commission on the Fourth Industrial Revolution (PC4IR) released its Summary Report and Recommendations, offering insight into the Fourth Industrial Revolution, its potential consequences for South Africa and suggested actions to take in the future. This report includes a strategy for AI (PC4IR 2020; CAIDP 2022). The importance of the PC4IR report is that it focuses on regulation, ethics and cultural aspects of the Internet, as well as technological developments such as sense-making, AI, robotics, autonomous systems, the Internet of Things and cloud computing. It provides a strategy for industrial development, aiming to ensure ethical and transparent use of these new technologies (PC4IR 2020). At the behest of the context of South Africa, lies structural challenges such as unemployment, poverty, inequality, and the digital divide. Should these structural challenges not be addressed, AI may exacerbate these challenges. Although the PC4IR mentions ethics, it does not provide the epistemology of the said ethics or its approach. There is thus a need to foreground *Ubuntu* ethics to mitigate the risks of AI holistically for humanity, spirituality, and the environment in the South African context.

5.5.1 Holistic *Ubuntu* Ethics AI approach

The holistic *Ubuntu* ethics approach includes (a) humanity, which comprises our relations as human beings which are rooted in human dignity; (b) spirituality, which comprises the relation of the Supreme Being (God), the living, and the living dead (ancestors); and (c) the environment, which comprises of our relations with the land, sea, sky, nature, and animals. The premise of the holistic *Ubuntu* ethics approach is that the human is not the centre of the universe but is part of the universe and everything in the universe is in relation and significant. Ramose (2005) attests that in African philosophy, individual identity is seen as part of a larger whole, rather than being defined by a single characteristic. This belief does not reject the reality of a person's limited existence but instead stresses the value of community in helping to comprehend one's own identity and the environment. *Botho/Ubuntu* ideals are being re-evaluated as Africa seeks ethical principles and values to aid in the formulation of

models of development and wealth creation within a neoliberal and globalizing framework (Dolamo 2013). The concept of *Ubuntu* is thus not static but its essence of humanity is at the core. Ramose (2005) argues that it is the process of being which signifies motion. That implies that *Ubuntu* cannot be "fully attained" but it is a process of becoming more humane. The emphasis on "human" may imply that *Ubuntu* is anthropocentric. LenkaBula (2008) has argued that *Ubuntu* should be understood as beyond anthropocentric because humans have an ontological, socio-political, economic, ecological, and religious relationship with themselves and the environment. This connection highlights the inseparability of human life and ecological life, proving that the self cannot exist without ecological systems. This indicates that Ubuntu is more holistic than it has been previously presumed. The Industrial Revolution and emerging technologies such as AI have not only have impacted on our socioeconomic structures but also our humanity, spirituality, and the environment. Therefore, it requires a holistic *Ubuntu* ethics of technology. Although Ubuntu ethics and AI in humanity, spirituality, and the environment will be discussed in separate subsections; it should be understood that they are interconnected and holistic in the African life and ethical epistemology. After the holistic *Ubuntu* ethics of technology have been discussed, a critique of *Ubuntu* will be deliberated.

5.5.2 *Ubuntu* ethics and AI in humanity

The historical context of South Africa which includes colonialism and apartheid about the Industrial Revolution reduced Africans to slaves, cheap labour, and exploitation (Moll 2020). Africans were thus regarded as "sub-human" which justified the conquest. *Ubuntu* ethics recognises the past and analyses patterns of the past in how they impact the present. The main tenet that Ubuntu ethics asks is the question of human dignity. There is no use for advancements in technology if they are developed to disregard human dignity. The previous Industrial Revolutions came with the cost of human dignity, it therefore did not uphold *Ubuntu* ethics that modernity with capitalism exploited and dehumanised the Africans. It has been indicated that the 4IR is inevitable, and it may either be a curse of the previous Industrial Revolutions or it can address the problems that face South Africa (Benyera 2022). Although the benefits of AI may be there it may widen the inequality gap even wider as South Africa's economy is still based on farming, mining, and the informal sector (Sutherland 2020). It is

essential for South African companies and policymakers to not just contemplate technical solutions but also pay attention to the social and economic implications of AI (Ormond 2023). The premise of *Ubuntu* ethics is that human beings are more important than AI technologies.

Although there is more coverage of AI technologies, there is less coverage of AI content moderators. The job of an AI content moderator is to monitor content such as child sexual abuse, murder, rapes, suicides, and bullying amongst others to flag or train the AI on what is considered graphic content. Young men and women from different countries in Africa are content moderators for major tech companies such as OpenAI, TikTok, Facebook, Google, and Microsoft via an outsourcing company called Sama (Perrigo 2022). The major concerns with AI content moderators in Africa are low wages as well as trauma, anxiety, and depression with no or inadequate psychological support (Rowe 2023). The working conditions are not conducive as they impact mental health, and some are paid as little as $1.50 per hour (Perrigo 2022; Perrigo 2023). Although South African Daniel Motaung wanted to initiate the process to unionise AI content moderators in Africa, he was subsequently fired in 2019 but in 2023 more than 150 workers established the first African Content Moderators Union in Nairobi (Perrigo 2023). The union is thus in a position to collectively represent the workers to address concerns such as an increase in wages, access to onsite psychiatrists, and regulations to safeguard employees from exploitative labour practices (Nondo 2023). As human beings are working behind AI but faced with unfair labour practices and working conditions that impact mental health, human dignity must be considered. *Ubuntu*/*Botho* acknowledges the rights and duties of all people, whether individuals or groups. It fosters individual and social well-being and wholeness (LenkaBula 2008).

Post-1994, in a democratic South Africa, the majority of Black Africans are living in poverty and faced with challenges of unemployment, violence, and the digital divide. When it comes to the digital divide, there is a lack of ICT skills and many instances, fundamental skills such as reading, writing, and comprehension (Sutherland 2020). Apart from that, those with access to the internet and digital devices may be considered more human than those without as most things in today's life are digital. Internet data is expensive in South Africa and there have been public calls such as #DataMustFall to reduce prices as well as advocating for internet data to become a

basic human right (Moyo and Munoriyarwa 2021). There are also digital infrastructure challenges as there are marginalised areas with a lack of or no network coverage. *Ubuntu* ethics take into cognisance the digital divide and seek to uplift marginalised communities to be connected to the internet. Initiatives such as community networks uphold *Ubuntu* ethics. According to Rey-Moeno and Pather (2020: 2), community networks are “telecommunications infrastructure installed, maintained and operated by the community (or some of its members) to meet their own communication needs…” In South Africa, there are two notable community networks in the rural area namely; Zenzeleni Community Network and Mamaila Community Network. Zenzeleni Community Network which means "do it yourself" in isiXhosa, is owned and maintained by the rural community of Mankosi in the Eastern Cape. The effort is in collaboration with the University of the Western Cape. Mamaila Community Network is in the rural area of Letaba local municipality in the Limpopo province (Internet Society 2023). Both Zenzeleni and Mamaila community networks provide an internet connection to residents where there is limited to no ICT infrastructure. Community networks are thus an alternative to the expensive internet provided by South African internet service providers like Vodacom, Telkom, and MTN. *Ubuntu* advocates for initiatives that can benefit the community and promote community development to address individual and communal needs (Chigangaidze 2022).

When AI is incorporated into the South African context, it poses unique a challenge as automated decision-making can reinforce historic stereotypes, discrimination, and exclusion in hiring processes, healthcare, insurance, surveillance, and creditworthiness (Erastus 2021). Crime and corruption are major problems in South Africa but how the media portrays crime, has a Black face, despite its claim of being neutral. In Johannesburg, AI-powered surveillance company Vumacam is expanding, normalizing segregation and punishment, cloaked as "neutral" security technology. This system flags 'unusual behaviour' which disproportionately affects the historically disadvantaged black demographic, such as manual labourers. This perpetuates the notion of the ‘criminal as a black male’, a stereotype rooted in apartheid-era passbooks (Kwet 2019; Birhane 2020; Hao and Swart 2022). Facial recognition technologies such as Vumacam infringe on privacy but Vumacam indicates that they comply with South Africa’s Protection of Personal Information Act (Popia Act) (Swart 2021). It has to be noted that Vumacam started using facial recognition before the Popia Act came into

effect and the use of footage is dependent on the clients of Vumacam (Swart 2021). Transparency is thus very important for the privacy rights of individuals to be respected. Vumacam indicates that the privacy risk is on the collective level (Black people), therefore *Ubuntu* would suggest that transparency is more important to the group but may also advocate for stronger group privacy protection than individual privacy (Reviglio and Alunge 2020; Van Norren 2023);

Language is essential for the culture and tradition of a people to express their lived experience. However, South African indigenous languages have been marginalised in the digital space and there is a lack of data on indigenous languages due to colonisation and apartheid suppressing these languages (Gwagwa et al. 2021). English is currently the dominant language and is highly resourced in South Africa (Begbie 2019). The importance of language in regards to AI is that Natural Language Programming (NLP) which is a sub-discipline of machine learning requires a corpus (huge collection of words and stories) to interpret, manipulate, and potentially generate human language. This corpus is used to train models to recognize the language, meaning of words, and emotions, and even to transcribe (Begbie 2019). The lack of corpus in regards to South African indigenous will further marginalise these languages as virtual assistants such as Siri, Google Assistant, and Amazon Echo are available in high-resourced languages such as English (Marivate 2020). AI tools such as ChatGPT and translation tools like Google translate are not fully supported in South African indigenous languages and when they do attempt to translate text, it is often not correct (Schacht 2023). *Ubuntu* ethics upholds that all languages are important and that no language is superior to the other. It is therefore imperative for the corpus of indigenous languages to be developed to thrive in the 4IR. It is therefore commendable that initiatives such as Masakhane meaning “let us build each other”, a grassroots organisation that acknowledges that colonisation impacted African languages but aims to promote NLP research in African languages for and by Africans. The digital space has a lack of understanding African of names, cultures, places, history, and perspectives (Masakhane 2023). A practical example is how Microsoft Word would underline African words in red as it does not recognise the language. Masakhane upholds *Ubuntu* and African-centricity in these two statements:

> This philosophy calls for collaboration, participation and community. It proposes relationality, over individualism for stronger social cohesions towards

> sustainable communities. It believes we share our successes and one's personhood is evaluated based on their contributions to the community (Masakhane 2023).
>
> We centralize the narratives of Africans as a remedy to the effects of Euro-centrism on our beliefs. This way we reassert a new way of looking at information from an African perspective and shun any attempts to devalue our knowledge and stories (Masakhane 2023)

Masakhane is thus a good example of *Ubuntu* in action to foreground the values of African languages and narratives in the digital space. Lelapa AI is a South African start-up headed by Pelonomi Moiloa to provide an NLP of underrepresented languages in South Africa to assist businesses in translating, transcribing, and analysing text and audio for local consumers (Lelapa AI 2023; Harrisberg 2023). Lelapa means "home" in Southern Sotho and Setswana. Although South African indigenous languages are low-resourced, Moiloa sees that as an opportunity for Africa to build its NLP which would be an alternative in the AI market (Allison 2023). Lelapa AI's website indicates that their philosophy is grounded on *Ubuntu* and asserts that:

> Lelapa's mission is to develop technology for the global family. We explore how contemporary challenges can be solved through centring technology on humanism based on relationality – advancing globally Responsible AI practices on the continent and beyond (Lelapa AI 2023).

It is thus commendable that *Ubuntu* is taking centre stage in the development of AI technologies as well as focusing on the African narratives that have been marginalised in the digital space. It is even commendable that community networks are connecting the remotest rural areas in South Africa with the Internet. *Ubuntu* ethics and AI in humanity is the promotion of marginalised indigenous languages and cultures into the digital space. Most importantly, it is not to leave already marginalised people to be further marginalised by technology. It is also important for human dignity to be considered in the workplace when human beings are training AI models on graphic content.

5.5.3 *Ubuntu* ethics and AI in spirituality

As mentioned, spirituality in African Theology comprises the communal relationship of the Supreme Being (God), the living, and the living-dead (ancestors) (Mangena, 2016). According to Mbiti (1991), African spirituality can be found in art and symbolism, music and dance, proverbs and riddles, names of individuals and places, myths and legends, beliefs, and practices. It should be noted that African spirituality is plural, diverse, and depends on ethnicity (Chiorazzi 2015). Ramose (2005) attests that African spirituality is a lived experience of the reality of the feelings of immanence and transcendence in the lives of African people. Masango (2006) expands it further that African spirituality is holistic in the life of Africans and encompasses all facets of life in society, economics, and politics. An African spiritualist's growth is shaped by *Ubuntu*, or humanness, which creates an intimate relationship between their identity and actions. This process of *Ubuntu* is fostered in the community (Masango 2006). African spirituality is what shapes *Ubuntu* ethics as it influences behaviour and activities which may be difficult for those outside of this spirituality to understand (Kobe 2021).

African spirituality in the South African context has been disrupted and suppressed by Christianisation wrapped in colonialism (Kobe 2021). Colonists, traders and missionaries had a major impact on the African people and their concept of *Ubuntu* or humanness. These changes included both positive and negative elements, such as the introduction of Western science and technology, but also the alteration of African self-perception (Dolamo 2013). Vellem (2015) argues that there are three models of the church in South Africa namely the settler, missionary, and struggle churches. The settler model is related to churches that catered to European settlers in South Africa, while the missionary model includes churches established by missionaries in African communities. The struggle model comprises churches established by African people in response to the deficiencies of the settler and missionary models, such as the Ethiopian Movement and African Initiated Churches (AIC) (Vellem 2015). Steve Biko's critique of the missionary church in African communities was that it fostered division between those who adopted Christianity and those who did not. It introduced a rigid Christian culture that was incompatible with indigenous beliefs and practices, leading to contempt and suspicion for those who did not convert to Christianity. This in turn created a playground for colonialists to exploit (Biko 1978; Kobe 2021). The AICs became the foundation of African Theology and subsequently South African Black

Theology of Liberation (BTL) and African Women's Theologies. In African theology, cultural liberation is a key focus, while BTL prioritizes political and economic liberation. However, this dichotomy has been challenged, as it fails to encompass the continent's diverse and rich theological history. Both theologies are concerned with culture and socio-economic politics as it is interlinked (Maluleke 2005; Tshaka 2022). African women's theologies on the other hand are concerned with how African women reinterpret culture and religion to empower women (Fiedler 2017). African Women's Theology was catalysed in 1989 by Mercy Oduyoye, Letty Russel, and Brigalia Bam. These three established the Circle of Concerned African Women Theologians (CIRCLE), which has since been a major force in the field (Maluleke 2022). Kobo (2018: 3) argues that South African Black women "have suffered triple oppression of race, class and gender, and their struggle to challenge the patriarchal culture of subordination." This triple oppression is continuing in the current times. At the heart of African Theology, BTL, and African women's theologies is the advocacy for the liberation of African spirituality.

The main question in this subsection is how AI impact on African spirituality. Mdingi (2020: 6) asserts that:

> advanced technological development poses serious existential anxieties to blackness, black spirituality, justice, human condition and liberation. The dimension of Western science and black liberation shares a historical connection. The West sees scientific advancement as human progression. However, the black experience seems to be seen it as armoury of the Western domination of the world (Mdingi 2020).

It has already been mentioned in the previous subsection regarding the marginalisation of African languages, cultures, names, and perspectives in the digital space. African perspectives such as spirituality are also marginalised as it is embedded in African languages and culture. The dominance of Western knowledge concerning African spirituality has classified it as "ancestor worship," "superstition," "animism," and "magic," amongst others (Mbiti 1991). These classifications intended to invalidate African spirituality. Scholars in the field of African spirituality have laboured to liberate the misconceptions and redefine them in their own way (Aderibigbe 2022).

AI attributes have been likened to the attributes of God such as AI being “all-knowing” and “present everywhere” which have posed questions about AI becoming God-like. (Spatola and Urbanska 2020). Transhumanists who advocate for radical human enhancement via emerging technologies to obtain super-longevity, superintelligence, and super well-being, pose the question if we want to become God. (Ross 2022). Both these questions are within the field of spirituality as it relates to God. Sande (2021) states that not many researchers have deliberated on the impact of human enhancement and African Traditional Religion. However, in African spirituality, Africans strive to maintain the interconnectedness of the Supreme Being, the living, the living-dead, and nature (Sande 2021). Asante and Mazama (2009) mention that the concept of the Supreme Being in African traditional thought is referred to as “unknown” in other words, human language is limited in describing an unlimited God. The Supreme Being is expressed in many names and attributes such as “creator or the ultimate source of all existence,” “everlasting and immortal,” “father,” “mother,” and “supreme judge who abhors injustice, evil, discrimination, and oppression of the weak” amongst others (Asante and Mazama 2009). Based on this, African spirituality posits that the Supreme Being who is the source and creator of all things in the universe cannot be likened nor replaced by AI. The knowledge that AI has is limited and does not consist of all knowledge in existence including knowledge of the past, present, and future. In extension to the second question on becoming God through radical human enhancement; it is impossible to become what is unknown. Even if humans can obtain super-longevity, super-intelligence, and super-wellbeing; it would have to be maintained one way or another which in the long run would be a futile exercise. The Supreme Being is the source and creator of all things and cannot be affected by the very creation. African spirituality understands that life has no end hence ancestors are the living-dead. Ancestors continue to live on in the spirit world (Aderibigbe 2020). In the African worldview, time is not linear but rather moves in cycles that are in part controlled by the cycles of nature (Mbuvi 2009). Thus, according to African spirituality, there is no need to radically enhance ourselves with technology as transhumanists aspire to as it would disrupt our interconnectedness with the Supreme Being, humanity, environment, and our ancestors.

Another impact of AI on spirituality would be the over-reliance on AI. The practices of technology, which are tied to materialism and the rejection of altruism, are the fastest-

growing religion, with humans placing indefensible trust in it, believing it can solve all problems (Fourie 2020). Waters (2015) *Is technology the new religion?* asserts that trust in technology disrupts our relationship with God and the community. We may be in awe of technology but not commit idolatry or put our faith solely on technology and shift our focus from the complex and wonderful creation of God (Fourie 2020). African spirituality emphasises human relations to be present in the lives of others to recognise the poor, marginalised and discriminated and to show compassion. African spirituality cannot place trust in what is AI as it is only an imitation of what is human but cannot embody humanness. Trust in African spirituality is placed on the Supreme Being, community, environment, and ancestors. Humanness is developed within a community (Masango 2006). This is more illustrated in the phrase “it takes a village to raise a child” which emphasises that relationships are essential in the development of spirituality in the community (Masango 2006).

5.5.4 *Ubuntu* ethics and AI in the environment

It has already been argued that *Ubuntu* is not anthropocentric but extends to spirituality and the environment (ecology) as well (LenkaBula 2008; Chibvongodze 2016). LenkaBula (2008) explains that ecology generally refers to the various values and activities of a thriving natural system, be it local, global, or cosmic. It is often used interchangeably with the term "environment." Ramose (2005) asserts that wholeness includes human beings and the environment; taking care of nature implies taking care of ourselves. Human beings cannot exist outside of nature, we depend on nature, and that dependence requires us to take care of nature. Du Plessis (2012: 15) concurs that humans are “an integral part of nature and partners in the processes of co-creation and co-evolution instead of being merely users or clients of various ecosystem services.” Humans must recognize their interconnectedness with the environment and other beings. This will lead to a greater understanding of the importance of reducing environmental problems and preserving the lives of both humans and animals. It is essential to realize that our individual lives are inextricably linked with others and the environment. Consequently, we should strive to protect and preserve the habitats of both humans and animals (Samuel 2023). *Ubuntu* thus emphasises the relationship of humans, spirituality, and the environment. In African culture there is a deep respect for nature, viewing it as a symbol of the Supreme Being. This understanding prompted

Africans to nurture nature, rather than subjugate it. Before a tree was cut down or an animal was to be slaughtered, for example, rituals were often performed. This connection to the earth was seen as essential, forming part of their spiritual practices (Masango 2006). Samuel (2023: 13) asserts that:

> When humans treat the habitats of nonhuman beings as something detached from them, especially when people exclude their habitats from the conception of what counts morally, this might prompt the exploitation of water, rivers, forests, and trees that are constitutive of their belonging in the world (Samuel 2023).

The ecological crisis that is present is a result of modernity and capitalism that centres humans as more important than nature and therefore exploit it for profit. Gumo et al. (2012) explain that this crisis impacts all people regardless of their location or societal status. This crisis is not just a matter of human welfare but poses a potential threat to humanity and creation itself. Historically, the Industrial Revolution has massively impacted the ecology known as the Anthropocene (Parikka 2018). Many species become extinct because of human action. Industrial Revolutions are thus responsible for what is called the "sixth mass extinction" for the exploitation (unsustainable) use of land, water, and energy as well as climate change (World Wildlife Fund 2022). This ecological crisis has been justified on the basis that human beings are superior to non-human beings and the ecology (Ferrando 2019). Scholars have suggested that the Anthropocene should be addressed by employing the notion of *Ubuntu* (Claassen 2021; Taiwo 2022; Kotze et al. 2023). According to Kotze et al. (2023), Sustainable Development Goals (SDGs) emerged in 1987 when it was realized that the world was on the brink of an ecological crisis. It was a positive movement which sought to tackle social injustice through sustainable development. However, it has since evolved and now serves to legitimize neoliberal globalization. Despite this shift, sustainable development remains an integral part of international environmental law, acting as a quasi-constitutional principle (Kotze et al. 2023). *Ubuntu* has been utilized in the environmental field, even if only in a conceptual manner, to fight against neoliberalism's propensity to undermine community authority and to encourage environmental preservation (Terblanché 2018) and it is proposed that *Ubuntu* can be an alternative to sustainable development (Terblanché-Greef 2019). *Ubuntu* ethics for the environment can be used to respect and preserve nature, and to help re-examine

the overall state of well-being for all living things (Kotze et al. 2023). Van Norren (2020: 440) asserts that condensing such a holistic philosophy as *Ubuntu* into measurable objectives and metrics goes against its fundamental goal to "infuse humans with a consciousness of wholeness and interdependence, on each other and their natural surroundings, including a spiritual level of being."

Although AI is improving in terms of learning and generating language, training AI models such as GPT-2 and BERT requires large finances and has environmental impacts. The computational hardware emits about 284,000 kilograms of carbon dioxide, nearly five times the carbon footprint of the average automobile, including its manufacture. AI models also require a substantial amount of electricity to train them (Strubell et al. 2019; Hao 2019; Hamilton 2023). Since then, AI models like BARD or GPT-3 and GPT-4 which have improved drastically have made more use of electricity and increased the carbon footprint. Another environmental issue with AI models is the large use of water to keep data centres and servers cool. All the data that is required to train AI models is stored in data centres, therefore the "cloud" as we know it is a physical place (Hamilton 2023). According to Li et al. (2023), freshwater scarcity is a major issue due to population growth, dwindling water resources and ageing water systems. AI models should lead by example and take responsibility for reducing their water footprint.

> Training GPT-3 in Microsoft's state-of-the-art U.S. data centres can directly consume 700,000 litres of clean freshwater, enough for producing 370 BMW cars or 320 Tesla electric vehicles, and these numbers would have been tripled if GPT-3 were trained in Microsoft's Asian data centres, according to public data sources (Li et al. 2023: 2).

That amount of water is massive and to put things into perspective; ChatGPT requires 500ml of water for a discussion of approximately 20 to 50 questions and responses (Li et al. 2023). Knowledge about the amount of water required for data centres has sparked protests in countries like Chile and the Netherlands. There have been protests about the construction of a new Meta (Facebook) data centre in a small town in Spain, which the corporation claims will require 195 litres per second during peak times (Hamilton 2023). There should be more transparency from tech companies about the carbon footprint and water usage of their AI models. AI models thus have an impact not only on the environment but humanity as well. Data centres make use of massive

land, water, and electricity to store data and train AI models while land, water, and electricity are fundamental challenges for many people in the world. The notion of *Ubuntu* ethics and AI for the environment requires a rethinking of AI models to be beneficial for society and not cause harm to the environment on the other hand.

This section has deliberated on a holistic *Ubuntu* AI ethics approach which includes humanity, spirituality, and ecology. The Industrial Revolution and emerging technologies such as AI have impacted humanity, spirituality and the environment which necessitate a holistic *Ubuntu* AI ethics approach.

The following section will deliberate on the critique of *Ubuntu*.

5.5.5 Critique of *Ubuntu*

As much as *Ubuntu* is argued to be an appropriate ethic, it has several critiques that will be deliberated. Van Binsbergen (2001) argues that *Ubuntu* is autochthonous (indigenous) and the humanity of the non-autochthonous considering the colonial past may be questioned or denied. Marx (2002) asserts that *Ubuntu* celebrates a past that is perceived to be ideal, emphasizing communal values and encouraging subordination to the group. He also notes that nation-building entails a simultaneous struggle between inclusion and exclusion. According to Richardson (2008), *Ubuntu* in post-apartheid has been used in a universalistic and a decontextualised sense. *Ubuntu* can thus be exploited or manipulated as it is resisting contextualization. Matolino and Kwindingwi (2013) agree that post-apartheid South Africa's attempt to promote *Ubuntu* as a restorative move and a way to create a black identity is an elitist project. They further argue that such projects in other African countries have historically failed. Therefore, the desirability of *Ubuntu* as a national spirit should be questioned. According to Metz (2011: 232), *Ubuntu* is thought to be an inadequate basis for modern South African morality due to its vagueness, neglect of individual freedom, and tendency to fit more with traditional cultures.

These critiques of *Ubuntu* are warranted as *Ubuntu* may be seen as utopianism, romanticism, and even universalism. However, it has to be reiterated that *Ubuntu* is not static or a concept that is stuck in the past (Letseka 2012). The essence of Ubuntu in this thesis is human dignity, ecological conservation, and spiritual freedom. It must be stated that although *Ubuntu* is indigenous in Southern Africa, it regards that all

people have inherent human dignity (Dolamo, 2013). The communality of *Ubuntu* takes into cognisance the diversity of individuals within the community and the well-being of the community is essentially the well-being of the individual. Nation-building is complex, especially in the South African context, where there is a history of colonisation and apartheid. A process of learning to treat each other with human dignity and unlearning all forms of subjugation, injustice, and inequality is required to uphold *Ubuntu*. *Ubuntu*'s acknowledgement of plurality and diversity prevents it from being universalistic. In other words, despite cultural, racial, and religious backgrounds, *Ubuntu* takes into cognisant the inherent human dignity and a way of life that regards human dignity. That does not imply that *Ubuntu* is utopian, but justice, solidarity, and equality are essential to *Ubuntu*. *Ubuntu* cannot be an elitist project because *Ubuntu* is alive in communities where human dignity, solidarity, justice, and equality are upheld (Metz 2014). At the centre of *Ubuntu* is justice for the dehumanised, excluded, vulnerable, abused, poor, and discriminated. This also responds to the notion of *Ubuntu* being vague and inadequate to modern society as it is aligned with human rights and the Bill of Rights in the constitution of South Africa (Metz 2011). The most essential thing that is recommended is for *Ubuntu* to self-critique to overcome its shortcomings and to be more impactful.

5.6 CONCLUSION

In the global landscape of AI ethics, there is a lack of representation of African and African ethical perspectives. There is also a gap between the global north and global south regarding AI development and deployment. There are thus power imbalances at play which exacerbate global inequality. It has been argued that coloniality is at the

root of these power imbalances. The notion of global AI ethics is problematic as it is Western ethics disguised as universalism. This universalism assumes that contexts are the same around the world and a one-size-fits-all AI ethical approach is appropriate. The dominance of Western ethics is reflected in global AI policies and regulations. It is critical to embrace and include ethical perspectives from the global south such as *Ubuntu*.

One of the major challenges of AI applications in Africa is that they are not contextual nor address the needs of the continent. AI in Africa should uphold African values, contexts, and experiences which would mitigate potential damage. The perception of AI in Africa is both positive and negative. It is positive because mundane tasks can be automated with limited human participation. It is negative because it may have an impact on job security. Upskilling on AI-related technologies is thus necessary to remain relevant in the future of work. Potential benefits of AI are that it could improve socio-economic growth, and increase tech-related employment, and quality of life with medical breakthroughs. Potential benefits require AI ethics awareness, sensitivity, and literacy in the African context. Potential risks of AI are job losses and further widening of inequalities. The monopoly of tech giants could hinder African countries from developing their own AI technologies. Africa can be at risk of exploitation and security risks due to deployed technologies. Biased data (discrimination) can be used to reproduce existing socio-economic inequalities as it is related to power imbalances and colonialism. Human rights violations are a major concern and it also raises questions about who is liable (when human rights are violated).

The opportunities of AI include socio-economic benefits and addressing issues of poverty, education, healthcare, and sustainability. AI can improve government processes to provide efficient service delivery as well as make use of data to help governments make better decisions. Upskilling on AI-related technologies can provide opportunities for the future of work. Africa has an opportunity to draft AI policies that could strengthen the benefits of AI while mitigating risks.

The data that AI makes use of is embedded in the coloniality of power. Technology should be understood as power as it influences decisions, behaviours, and connections are determined by data analysis using sophisticated statistics and forecasting models. Data is informed by Western modernity and subsequently, global

capitalism which are both continued historical processes that marginalise epistemologies of the global south. Terms such as data colonialism and data capitalism refer to data as a commodity, with its history of colonialism and capitalism. Algorithmic coloniality developed from data colonialism refers to automated decision-making systems that make decisions based on historical bias, discrimination, racism, and injustice amongst other types of harm. There are thus calls to decolonise AI in its design. The bottom-up approach of decolonial AI is the emphasis on the collaboration of the AI designers with the marginalized communities and learning from them to better understand their needs and context.

In African epistemology, there is interconnectedness of everything in the cosmos and the human is not the centre of the universe. It has been argued that *Ubuntu* should be understood beyond anthropocentric lenses. Thus, *Ubuntu* is holistic as it is the interrelationship of humanity, spirituality, and the environment. The Industrial Revolution and emerging technologies such as AI have not only impacted our socio-economic structures but also our humanity, spirituality, and the environment. South Africa has structural problems such as inequality, unemployment, and poverty; AI could exacerbate these challenges. The historical context of South Africa which includes colonialism and apartheid concerning the Industrial Revolutions has reduced Africans to slaves, cheap labour, and exploitation. *Ubuntu* ethics takes into consideration the past and analyses patterns of the past and how they impact the present. *Ubuntu* ethics upholds that there is no use for technological advancements at the expense of human dignity. It is essential for South African companies and policymakers to not just contemplate technical solutions but also pay attention to the socio-economic implications of AI. *Ubuntu* upholds that human dignity is essential and the rights of all people should be considered especially the marginalised. *Ubuntu* ethics takes into cognizance the digital divide and advocates to uplift marginalized communities. Internet data is expensive in South Africa and alternatives such as community networks can bridge the digital divide in rural to urban areas. Automated decision-making systems in South Africa may reinforce historic stereotypes, discrimination, and exclusion in hiring processes, healthcare, insurance, surveillance, and creditworthiness. AI models like ChatGPT and Google Translate do not adequately translate African Indigenous languages. Indigenous South African languages are marginalised in the digital space and are dominated by English. *Ubuntu*

ethics upholds that all languages are important and that no language is superior to the other. It is therefore imperative for the corpus of indigenous languages to be developed to thrive in the 4IR.

AI attributes have been likened to the attributes of God such as "all-knowing" and "present everywhere." Transhumanists aspire to transcend human limitations to obtain super-longevity, super-intelligence, and super well-being via emerging technologies which poses the question are we becoming God. There is also a concern that humans may have an over-reliance on AI and trust its information. At the heart of African Theology, BTL, and African women's theologies is the advocacy for African spirituality. African spirituality posits that the Supreme Being who is the source and creator of all things in the universe cannot be likened nor replaced by AI. Human beings can also not become God even if they radically enhance themselves with emerging technologies. African spirituality understands that life has no end hence ancestors are called the living-dead. According to African spirituality, transhumanism would disrupt our interconnectedness with the Supreme Being, humanity, environment, and ancestors. Trust in African spirituality is placed within the interrelationship and interconnectedness of the Supreme Being, community, environment, and ancestors.

There is an ecological crisis as a result of modernity and capitalism. The environment has been exploited and many species are becoming extinct which has been referred to as the Anthropocene. Data centres to store data and train AI models make use of massive land, water, and electricity; and also emit massive carbon footprints. Scholars have suggested that the Anthropocene should be addressed by employing the notion of *Ubuntu*. *Ubuntu* is about caring for the environment as human beings are dependent on the environment and cannot exist outside of nature. *Ubuntu* ethics can be an alternative to SDGs because in African culture there is a deep respect for nature, viewing it as a symbol of the Supreme Being. *Ubuntu* understands that nature should be nurtured and not subjugated. The notion of *Ubuntu* ethics and AI for the environment requires a rethinking of AI models to be beneficial to society and not cause harm to the environment on the other hand.

Some of the critiques of *Ubuntu* are that it is utopian, vague, and universalistic. Although the critiques are warranted, it has to be reiterated that *Ubuntu* is a process to recognise each other’s inherent dignity and therefore not static or romanticizing

about the African past. Recognizing each other's inherent dignity implies that justice, equality, and solidarity are essential for Ubuntu. Anything that disregards inherent dignity such as oppressing others, discrimination, marginalization, and dehumanization is against the principles of *Ubuntu*. *Ubuntu* takes into cognisance the diversity of individuals within the community and the well-being of the community is essentially the well-being of the individual. *Ubuntu*'s acknowledgement of plurality and diversity prevents it from being universalistic. In other words, despite cultural, racial, and religious backgrounds, *Ubuntu* takes into cognisant the inherent human dignity and a way of life that regards human dignity. This thesis does not only focus *Ubuntu* on human-human relations but also includes the environment and spirituality. For *Ubuntu* to overcome shortcomings it should be able to self-critique.

The following chapter 6 is the conclusion of the study. It summarises and reflects on the major discussions as well as recommendations for future studies.

CHAPTER 6

CONCLUSION

6.1 INTRODUCTION

This chapter concludes the study by summarizing and reflecting on the major discussions. It will restate the research problem and how the study has attempted to respond to it. This chapter will emphasise the contribution of this study to the field of ethics of technology and make recommendations for future research.

6.2 MAJOR DISCUSSIONS ON THE STUDY

The research problem for this study is broadly that global south ethical perspectives in the global AI ethics discourse are excluded and are dominated by ethics from the global north. More specifically, the global AI ethics discourse is dominated by Western ethics which also embed universalism. This universalism assumes that AI ethics impacts countries the same way and a one-size-fits-all ethical approach is appropriate. This study argues that African ethical perspectives such as ubuntu are appropriate in the African context to deliberate on the impact of AI. Emerging technologies such as AI have an impact on humanity, spirituality, and the environment. Western AI ethics only considers the impact of AI on humanity which has left a gap in how AI affects various facets of life, especially humanity, spirituality, and the environment. This study fills in the gap by proposing a holistic Ubuntu AI ethics approach that deliberates on the AI's impact on humanity, spirituality and the environment.

Chapter 1 introduced the topic of the study and deliberated on technology as power. Technology as power influences socio-economic structures and the distribution of power in society. It emphasized that technology is not neutral in development and deployment. Technology as power has implications to empower or disempower individuals or communities. It discussed the role the ethics of technology plays in monitoring and mitigating the power of technology. It indicated the importance of the historical impact of technology in the African context.

Chapter 2 deliberated that technology is a human trait and unpacked the African epistemology of technology via AIKS and ancient African technologies. It has indicated that AIKS were community based, served a particular need, and were sustainable for the environment. This is in contrast to the impact of the Industrial Revolutions in Africa that contributed to slavery, dispossession, colonization, and imperialism. It questioned

if the 4IR would recolonize Africa or if Africa should harness its power to participate in the global economy. The question was at the backdrop of the state of Africa and South Africa specifically where there are structural problems of inequality, poverty, unemployment, and the digital divide. There is a lack of ICT infrastructure, ICT skills, and fundamental issues of reading and comprehension. Chapter 2 links with Chapter 1 by contextualizing the notion of technology as power in Africa generally and South Africa specifically.

Chapter 3 discussed the notion of the post-human in the context of emerging technologies especially, regarding human enhancement. The future of humanity was deliberated from a scientific and theological perspective. The previous chapters deliberated on technology as power in changing socio-economic structures as well as colonization. This chapter focused on transhumanism, radically enhancing ourselves with emerging technologies to obtain super-longevity, super-intelligence, and super-wellbeing. It posed questions if we would still be considered human beings or a new species. It questioned if we are becoming God or playing God. This was argued theologically and philosophically. Theologically, we cannot save ourselves by technologically "escaping" our biological human limitations. It is only God that can save humanity and the cosmos. Humans cannot become God regardless of radical technological enhancements. Philosophical posthumanism deconstructed the notion of the human from historical connotations that justified oppressing others based on differences and causation of the Anthropocene. It argued that humans should embrace diversity rather than a hierarchy based on differences and that humans are part of the ecology and not superior to ecology.

Chapter 4 deliberated on how emerging technologies such as AI have been in the process of being regulated globally. It argued for a need to regulate AI as the previous chapters have deliberated on how technology was used to oppress and marginalize people as well as the negative impact on the environment through the Industrial Revolution. This chapter has deliberated on AI ethical guidelines and regulations drafted by the public sector, NGOs, and the private sector in the world. It identified that there is a power imbalance of AI in the global north and the global south. The majority of the global AI ethics regulations were drafted in the global north and there was an underrepresentation of the global south. It deliberated on the major AI tech companies and their AI applications. There are also examples of reported AI incidents by

applications developed by tech companies. Although some major tech companies have AI policy statements the draft process is exclusive to the company. This chapter deliberated on the debate about who should regulate AI between the public sector and the private sector. The private sector argues that regulation will stifle innovation, the public sector wants to regulate, and the NGOs are the watchdogs of both the public and private sectors.

Chapter 5 proposed a holistic Ubuntu AI ethics approach that includes humanity, spirituality, and the environment. This was propagated by the impact of the Industrial Revolutions in Africa and the current discourses of AI ethics that have excluded African ethical perspectives. This chapter deliberated on AI as coloniality in the African context from the perspective of decolonial AI. This chapter deliberated on the perspective of AI in Africa regarding global AI ethics embedding Western ethics and the issue of universalism. It also deliberated on the perception of AI in Africa, including the potential benefits, opportunities, and risks. This chapter argued that AI impacts humanity, spirituality, and the environment; therefore, it requires a holistic Ubuntu AI ethics approach.

6.3 MAJOR CONTRIBUTION TO ETHICS OF TECHNOLOGY

This study has deliberated that ethics has many theories from Philosophy, Theology, and Religion. It has been argued that the ethics of technology should be contextual as technology impacts contexts differently. However, the field of ethics of technology is dominated by Western ethics which embed universalism. This has been identified in the global AI ethics discourse, that other ethical perspectives were not taken into consideration for their contexts. This study also argued that AI ethics should take into consideration the historical impact of technology in Africa as emerging technologies are not in isolation from history. This study has identified that the current AI ethics discourse emphasizes the impact of AI on humanity and less or not at all on its impact on spirituality and the environment. This is also evident in the literature that uses the perspective of Ubuntu ethics in regarding AI as it emphasizes anthropocentrism. This study contributes a holistic *Ubuntu* AI ethics approach that includes humanity, spirituality, and the environment in the African context.

6.4 RECOMMENDATIONS FOR FUTURE STUDIES

Ethics of technology is a growing field, particularly emerging technology. The are many aspects that should be explored in the 4IR and 5IR as they impact the many facets of life from different perspectives. These can include but are not limited to Theology (and sub-disciplines), Religion(s), Politics, gender, and sexualities (LGBTQIA+). This thesis has touched on many themes that are worth considering for future studies and will be deliberated on thematically

Anthropology and technology

There are within cultural anthropology broad indications of technological developments within the story of Homo sapiens which are worth considering for future studies. The story of the Homo sapiens regarding technology speaks to the root of humanity's relationship with technology. Some of the tools and systems of living included stone tools, fire, cooking, farming, and animal herding. The relationship of humans and technology anthropologically was that of survival and sustainable living. This co-existence and co-development of humans and technology is worth considering for further studies. Another aspect worth considering is how the use of technology impacts the environment vis-à-vis the relationship between humans and nature.

African epistemology of technology

It has been established that Africa possessed technologies in ancient times and had a way of life that made use of African science and technologies. Scholarship of AIKS is important to deliberate in as diverse ethnicities navigate life differently. This indicates that there is rich knowledge that has to be explored that can assist in expanding the AIKS scholarship. Although ancient African civilizations have been explored, there are also small communities that have not received much attention. Although this has broadly touched on African astronomy, mathematics, writing systems, and metallurgy; there are also other aspects such as ancient architecture (engineering), navigation (transportation), and medicine. It is not only important that Africans had science and technology but the rationale behind it is also essential to discover the epistemology. AIKS is not only about the past but our present and future.

AIKS should also be deliberated from an African Theological and spiritual perspective. This implies that the knowledge of science and technology have a source which is the Supreme Being. What is also worth considering for future studies is the impact of Globalization on community-based science and technologies.

Industrial Revolution and Theology

The history of the Industrial Revolution has been discussed but a recommendation for further studies would be its relationship with Church History. The reason for this is that the church had been present and had an influence on the cause of Western history. It is thus essential to explore how each industrial revolution was either influenced or supported by the church, especially in the African context. What is also worth exploring is the response of the church regarding the negative impact the Industrial Revolution had on Africa. The impact of the industrial revolution concerning ecclesia or the life of the church is worth considering. Since the Gutenberg Press during the Reformation influenced the dissemination of information at a rapid pace, it is worth studying how the different forms of traditional media have influenced missions in Africa. It would also be recommended for how the African Initiated Churches responded to Western technologies be it for the church or society at large. The disruption of the Industrial Revolution in Africa should be explored from different theological perspectives such as African Theology, Black Liberation Theology, and African womanist Theology. The 4IR and 5IR need to be explored more theologically for Theology to be more active in the discourse.

Radical Human Enhancement and Theology

As emerging technologies are advancing, so is their ability to radically enhance humans in the future. The goal of radical human enhancement is to escape (transcend) biological human limitations such as old age, disease, intelligence, and even death. Although the thesis discussed the Transhumanist movement in general, it also mentioned that within the movement, there are distinct groups such as libertarian transhumanism, democratic transhumanism, extropianism, and singulariatism which should be explored more individually from a theological perspective. There is also a Christian Transhumanist Association that endorses transhumanism which should be critically discussed. These movements promote a

future that is more technology and less human which raises questions about what it means to be a human in the future or if a new species will be born. This goes back to the co-development and co-existence of human-technology relations from using technology to navigate life to become technology. Although these discussions are future-oriented, it is important to deliberate on them and become part of imagining the kind of future that we want. Theologically, we need to critically deliberate on eschatology and technology. Another recommendation for further studies would be the relationship of God, humans, and technology that should be deliberated on theologically.

Theology, Technology, and Policy

A recommendation for further studies would be for the Theological discipline to be active in policymaking processes. Theology is one of the disciplines that are not considered as a stakeholder in the policymaking process and it should be amended. It should be noted that this is not the same as a church and state relationship which in the context of South Africa has had a negative impact in apartheid. However, it is about theologies that would be able to advocate for the poor, marginalized, and discriminated. It is also about theologies that promote justice, equality, and reconciliation. It is a recommendation for Theology to translate its socio-economic findings into policies that can transform society for the better. It is about theologies that are not afraid to be interdisciplinary with technology and policy. Many technological advances are good for society but some are not only unethical but are destructive. Theology should thus be involved in the discourse of tech policy and contribute to a more just world that takes into consideration the poor, vulnerable, and neglected in society. Another aspect is the prophetic role of the church to hold government and/or tech companies accountable for deploying technologies that are destructive to society.

AI Ethics and the church

It is recommended that for future studies the involvement of the church in AI ethics be deliberated on. An example, the Roman Catholic Church has been active in the field of AI ethics. Pope Francis has made statements regarding AI since 2020, especially regarding autonomous weapons. The Pope also supports the Rome Call for AI Ethics

which promotes responsible AI. This contribution of the Vatican regarding AI ethics and its impact is worth considering for future studies. It would also be recommended to research the stance of other ecumenical organizations such as the World Communion of Reformed Churches (WCRC), World Council of Churches (WCC), Council of World Mission (CWM), All Africa Conference of Churches (AACC), and Organization of African Instituted Churches (OAIC) amongst others in the world and regions.

6.5 CONCLUSION

This study deems the importance of epistemologies that have been marginalised such as African epistemologies. *Ubuntu* has a lot to contribute to making the world more humane and just. Technology has many benefits that can make humanity flourish and solve the world's most pressing challenges but instead, capitalism and neo-colonialism are hindering the flourishment. Although Africa has been colonised and subjugated, its rich philosophies can contribute to a better world. Stephen Bantu Biko (1978: 46-47) has put it succinctly that:

> We reject the power-based society of the Westerner that seems to be ever concerned with perfecting their technological know-how while losing out on their spiritual dimension. We believe that in the long run, the special contribution to the world by Africa will be in this field of human relationship[s]. The great powers of the world may have done wonders in giving the world an industrial and military look, but the great gift still has to come from Africa - giving the world a more human face (Biko 1978).

We have a responsibility to embody *Ubuntu* grow spiritually, and take care of the environment.

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