

Annex 1: Metaphors Falsehoods, Misinformation, Disinformation

Metaphors: The Perils of Misrepresentation: AI Responses by Gemini and ChatGPT

Metaphor: Definition by Wikipedia: “A **figure of speech** or **rhetorical figure** is a word or phrase that intentionally deviates from straightforward language use or [literal meaning](#) to produce a [rhetorical](#) or intensified effect (emotionally, aesthetically, intellectually, etc.).^{[1][2]} In the distinction between [literal and figurative language](#), figures of speech constitute the latter. Figures of speech are traditionally classified into [schemes](#), which vary the ordinary sequence of words, and [tropes](#), where words carry a meaning other than what they ordinarily signify.”

The modern use of metaphors to describe one of the most important tools created and used by humankind for communications, knowledge sharing, learning, and human development, is misleading at best for most of the global population, yet extremely lucrative for the few global citizens who design and market the technologies and the metaphors that purport to describe them. For many technologically challenged global citizens who have been “left behind” by humanity’s race for more knowledge and the economic benefits it enables, metaphors like “[Digital Worlds](#)¹” and the “Clouds” of “New [Oxygen](#)²” do little, if anything, to promote understanding, and therefore productive use of the underlying technologies. What the metaphors do very well is to fuel the desires for the latest fashionable technological gizmos that do little to satisfy the basic needs of most economically, educationally, and technologically challenged citizens and their children.

The metaphors also help to feed the insatiable appetite for more of everything by most of those who have acquired the understanding of, and therefore productive access to, such knowledge. An article published in [theconversation.com July 2023](#) discusses the impact of one such group of gizmos, cell phones and their numerous variants, the most popular variants priced from R 10,999 to R 33,999 by a [well-known seller in South Africa](#), equivalent to between [14.5 to 44.6](#) times the 2023 monthly food poverty line under which up to 65% of South Africa’s children must survive.

The South African challenges of STEM literacy are especially damaging in this knowledge-driven age of space exploration, rapidly unfolding knowledge about ourselves and our ancient past, e.g., Palaeoscience - [South African Government Palaeoscience Strategy here](#) – very few South Africa learners will know the meaning of the term, nor will they know and understand the science behind the impact of humanity on its living environment.

The South African Case Study concerning the Homo naledi Controversy presented in Annex 2 of this document is just the tip of the iceberg defining the conflict between religious and scientific knowledge, which divides humanity into those who are committed to the biblical versions of creativity, and those who know and understand the scientific evidence of the formation of the universe and its millions of planetary descendants like Homo sapiens’ earthly home.

Has the 13.7-billion-year-old universe and its 4.6-billion-year-old earthly offspring been replaced by “Digital Worlds” in the minds of the nation’s children, whose STEM literacy is poorly developed through no fault of their own? As technology progresses into the new era of Quantum Computing ([IBM August 2024](#)) driving powerful new forms of AI yet to be conceived or developed, will we migrate this “Neo-Digital World” full of

¹ **Digital World Definitions:** Given the paucity of a definition for this “digital world,” the AI platforms of ChatGPT and Gemini were prompted to suggest a definition. **ChatGPT:** “the digital world is a human-constructed reality that offers new possibilities for interaction, communication, and creation;” Gemini: While there’s no single, universally accepted definition of the term “digital world,” institutions like the ITU, World Bank, OECD, Google, Microsoft, etc., use the metaphor extensively to discuss the process of digital encoding and decoding of analogue signals to enable digital computing. This process is being extended to the unfolding world of quantum computing – qubits are inherently analogue, but engineers can extract digital signals from them and replicate the world of digitally encoded analogue signals.

² **Oxygen:** The “Old Oxygen” comprises a gaseous concoction “brewed” from cyanobacterial photosynthesis deep in the ancient oceans about 3-billion years ago, before enough was “brewed” to enter the earthly atmosphere to enable living organisms about 2.33 billion years ago: [MIT 13 May 2016](#). The “New Oxygen” is simply data derived from the use of digital technologies: Read “[Data is more than the new oil — it’s oxygen](#)” published by the “[IE UNIVERSITY](#)” on 05/04/2022.

“Neo-Oxygen” into a new “[Qubital World](#),” replacing the “new oxygen” with “[Qubital Clouds](#)” of new life-giving or life-depriving gasses? Will the “[Bioengineering](#)” research facility at the University of Pretoria (UP) supersede even the new “Qubital World” to unleash “a small class of ‘superhumans’ and a huge underclass of ‘useless’ people” as suggested by Professor Yuval Noah Harari in his Guardian News 2017 article “[Are we about to witness the most unequal societies in history?](#)”

Science and technology, if mired in misinforming, misleading, misunderstood, misguided metaphors, could reverse all the good visualised by [South Africa’s NDP](#) architects, and their global partners who visualized the [global SDG initiative](#), unleashing the much-discussed existentialist threats arising from ignorance of, and potential abuses of technology; read e.g., [MIT Technical Review of 19 June 2023 here](#).

The education of South Africa’s children, the future generations of adults who were defined at birth by science instead of the belief systems and social hierarchies triggered by the Neolithic Revolution, should begin with full clarification and therefore understanding of all related STEM components and facts, at the most basic levels of understanding that their young minds can accommodate and use in future.

The following list of key related references is a tiny fraction of the vast knowledge repositories about the real analogue world and its constituents, with examples of how meaningless metaphors have captured global attention. These complex subjects are available to all humankind, easily accessed through information and communications technologies which the metaphors under discussion are meant to describe. The complex subjects can, especially with the help of technologies like AI, be reviewed and expanded where necessary, or “clouded in obfuscation” by more meaningless metaphors which tend to mislead instead of inform.

- [Age of Our Earth: 6,000 or 4.5 billion years old?](#) University of Notre Dame
- [Mankind: Who are we?](#) University of Notre Dame
- [The Age of Humans: Evolutionary Perspectives on the Anthropocene](#) Smithsonian, January 2024
- UNDP Digital Worlds: https://www.undp.org/sites/g/files/zskgke326/files/2024-05/undp_digital_inclusion_in_a_dynamic_world.pdf
- UNCTAD Digital Worlds: https://unctad.org/system/files/official-document/der2024_en.pdf
- UN Digital Worlds: <https://www.un.org/en/pdfs/DigitalCooperation-report-for%20web.pdf>

South Africa, with global records of socio-economic-political inequalities, dominated by opportunity-sapping learning inequalities ([more than 80% of the nation’s children cannot read for meaning at grade 4](#)), presents a classic case of metaphoric “good intentions gone wrong.” The new “[Digital World](#)” is now sustained by “[Digital Clouds](#)” of the “[New Oxygen](#).” About 20% of South Africa’s population are equipped with the STEM grounding to understand the real meanings of all these metaphors, while 80% of the nation’s children languish in the darkness of techno-illiteracy, achieving amongst the lowest results in all credible international STEM subject assessments during their formative years (Table 4 on page 6 of this document). Their reading skills are equally challenged as shown also in Table 4.

On 31 May 2024, South Africa’s Department of Communications and Digital Technologies published its final version of the [National Data and Cloud Policy 2024](#).

Will this Cloud Policy 2024 demystify “*the visible mass of minute particles suspended in the air, or a gas*” as defined by the [Merriam Webster](#) Dictionary? Will a young South African child trying to understand the mysteries of technology and its constructive and/or destructive use zero in on Merriam Webster’s alternative definitions, including: (3.) “*Something that has a dark, lowering, or threatening aspect,*” or (4.) “*Something that obscures or blemishes*”? Will the child’s teacher, parent, relative, guardian or peer prefer the Collins Dictionary definition of the verb “*if something “clouds” your view, you are unable to understand it or judge it properly.*”

Clearly, the intentions of the policy are good, but the unexpected outcomes can be extremely “cloudy.”

An excellent starting point to correct this “techno-illiteracy” enhancing quagmire of “cloudy information” is to reconsider and revise all national policy and regulatory instruments which guide this AI-driven

technological age, so that all segments of the population, rich and poor; literate and less literate; young and old; have the means of understanding these technologies for their growth and for their protection.

The development of a new holistic proactive all-embracing AI regulatory development is a logical starting point to resolve this quagmire.

Towards that objective, the following discussion of the role of metaphors in developing such a regulatory framework, and even more importantly, in steering the nation's development towards an effective inclusive information technology sector that addresses the needs of all South Africans, may be helpful.

In the search for knowledge clarity and understanding in this age of "*cloudy digital obfuscation*" (read [Mystification: The Dreadful Side of Cloud Computing](#)), the "[Large Language Models](#)" (IBM March 2023) of AI, capable of interrogating the world's vast repositories of knowledge, and drawing consensus conclusions in microseconds, have become essential tools. Two of the leading AI platforms, [ChatGPT](#) and [Gemini](#), were prompted to search the global databases of knowledge, and to present consensus conclusions on the potential for misinformation and disinformation resulting from the popular use of technological metaphors. A focus on South Africa was based on the country's position as the global leader in multidimensional inequality. AI can help to mitigate South Africa's challenges, but if ignored or abused, AI will exacerbate them. Using AI tools in this way provides an additional level of confidence - the reduction of bias, deliberate or unintentional, by both authors and the AI tools themselves. Selected responses offered by [Google's Gemini](#) and [OpenAI's](#) Artificial Intelligence platforms are provided in full below.

GEMINI Response on the Perils of Metaphors: 30 July 2024

The Perils of Metaphors in Technology: A Focus on Educational Inequality

Thank you for your insightful and detailed rephrasing of the prompt. Your emphasis on the potential harm of misleading technological metaphors, particularly in the context of South Africa's educational disparities, is crucial.

The Misleading Nature of Technological Metaphors

You correctly highlight the danger of oversimplified metaphors like "cloud computing," "digital worlds," and "data is the new oxygen." These terms, while convenient for marketing and general public consumption, can obscure the complex realities of technology and its implications.

- **Cloud computing:** This metaphor can foster the misconception that data is magically stored in an ethereal space, rather than on physical servers located in specific geographical locations. It can also obscure the energy consumption and environmental impacts associated with data centers.
- **Digital worlds:** This term can create a false dichotomy between the "real" world and the "digital" world, ignoring their interconnectedness and mutual influence. It can also downplay the potential for digital spaces to replicate or exacerbate real-world inequalities.
- **Data is the new oxygen:** This metaphor, while attention-grabbing, oversimplifies the role of data. It can lead to the belief that data is inherently valuable and beneficial, without considering issues of data privacy, security, and bias.

The Impact on Education and Society:

In countries with significant educational disparities like South Africa, these misleading metaphors can have particularly harmful consequences:

- **Reinforcing digital divide:** Oversimplified concepts can create a barrier to entry for those without access to quality education, further widening the digital divide.
- **Misallocation of resources:** Misunderstandings about technology can lead to ineffective policy decisions and misallocation of resources, hindering development.

- **Undermining critical thinking:** Reliance on simplistic metaphors can discourage critical thinking and problem-solving skills, essential for addressing complex challenges.

The Role of AI in Addressing the Issue

As you suggest, AI can play a role in mitigating these issues by providing clearer and more accurate explanations of technological concepts. However, it's essential to ensure that AI-generated content is unbiased, transparent, and accessible to a wide audience.

Key considerations for AI-driven explanations:

- **Clarity and simplicity:** While avoiding oversimplification, explanations should be accessible to individuals with varying levels of technical knowledge.
- **Contextualization:** Explanations should be grounded in real-world examples and implications.
- **Ethical considerations:** AI-generated content should adhere to ethical principles, avoiding biases and misinformation.

By promoting a more nuanced understanding of technology through clear and accurate language, we can contribute to a more equitable and informed society.

Would you like to explore specific strategies for improving technology education in South Africa, or perhaps delve deeper into the ethical implications of AI in this context?

ChatGPT Response on the Perils of Metaphors, 30 July 2024

Re-examining the potential mis-education caused by popular metaphors like "cloud computing," "digital worlds," and "data is the new oxygen" highlights important issues, especially in contexts like South Africa where educational inequalities are stark. These metaphors, while catchy and helpful in simplifying complex concepts for certain audiences, can often be misleading or confusing, particularly for those with limited access to high-quality STEM education. This can exacerbate existing inequalities, as these metaphors often assume a level of understanding that is not universal.

Impact of Metaphors on Education and Understanding

1. **"Cloud Computing":** This metaphor suggests an ethereal, intangible space where data is stored, which can mislead individuals into thinking of data as less physical and potentially less secure. For students in under-resourced educational systems, the lack of understanding about the physical infrastructure behind "the cloud" (such as data centers and server farms) can lead to misconceptions about privacy, security, and the environmental impacts of data storage.
2. **Digital Worlds":** This term can give the impression of a separate, entirely distinct reality from the physical world, which may obscure the profound connections and impacts of digital technologies on real-world issues. For those with limited exposure to comprehensive digital literacy education, this metaphor might mask the complexities of digital citizenship, including data privacy, online security, and the socio-economic impacts of digital exclusion.
3. **"Data is the New Oxygen":** This metaphor emphasizes the importance of data but can be misleading by suggesting data is as universally accessible and essential as oxygen. It fails to account for the digital divide and the inequalities in data access and usage. In South Africa, where educational and technological access is highly uneven, this metaphor might obscure the reality that data and digital technologies are not equitably distributed, thus exacerbating socio-economic divides.

Educational Inequalities and the Misapplication of Technological Advances

The disparity in education quality between wealthy and underprivileged communities in South Africa magnifies the potential for these metaphors to contribute to misinformation and misunderstanding. In well-resourced educational environments, students may have the context and support to understand these

metaphors and their limitations. However, in under-resourced schools, these same metaphors can contribute to a superficial understanding of technology, leading to misconceptions about its capabilities and limitations.

This superficial understanding can be particularly harmful when it influences policy-making. Political leaders who lack a deep understanding of technological nuances might make decisions based on these metaphors, which can lead to ineffective or even harmful policies. This is especially concerning in a country like South Africa, where technological advancements are seen as key to addressing economic and social challenges. Misguided policies could exacerbate inequalities rather than alleviate them.

Role of AI in Addressing These Challenges

Artificial Intelligence (AI) can play a pivotal role in improving the clarity and accuracy of technological education. AI-driven educational tools can tailor learning experiences to individual needs, helping to bridge the gap in understanding. Moreover, AI can assist in creating more accessible and accurate representations of complex technological concepts, moving beyond simplistic metaphors.

However, this potential will only be realized if there is a concerted effort to implement AI and other technological tools in a way that is inclusive and accessible. This requires investment in infrastructure, teacher training, and curriculum development to ensure that all students, regardless of their socio-economic background, have access to high-quality STEM education.

Conclusion

While metaphors like "cloud computing," "digital worlds," and "data is the new oxygen" can make complex technological concepts more accessible, they also risk oversimplifying and misinforming. In contexts with significant educational disparities, like South Africa, these risks are amplified. To mitigate these risks, there must be a focus on improving STEM education and ensuring that technological metaphors do not obscure critical understandings. AI and other digital tools can support this effort, but only with careful implementation and a commitment to equity.

Case Study: Conspiracy Theories and South Africa's educationally-marginalized citizens.

A recent visit by the author of this document to a Johannesburg supermarket ended with an interesting discussion with a car guard – one member of an army of economically and educationally marginalized yet proud South Africans eking out a living by “guarding” shoppers’ vehicles in return for a pittance – about R10.00 (≈US\$ 0.5) is a reasonable non-obligatory rate for such services.

The car guard expressed strong beliefs in the conspiracy theory that “[Bill Gates invented the Coronavirus in order to destroy poor people in developing countries](#)” (link to BBC article of 6 June 2020). He also expressed a strong opinion supporting the Russian invasion of Ukraine, verifying that his “source of knowledge” was social media, which he was able to consult via his “smart phone.” Of course these conspiracy theories are just that – [conspiracy theories](#) – read “Fact Check by Reuters: ‘[Bill Gates is not responsible for COVID-19](#)’”

Given the seriousness of the possibility of misunderstood technological metaphors to spread dangerous conspiracy theories, Google’s Gemini was prompted to consult the global database of knowledge and provide a consensus opinion on metaphors and conspiracy theories:

Gemini Response:

Technological Metaphors and Conspiracy Theories: A Dangerous Combination

The Role of Misunderstood Metaphors

Technological metaphors, while often used to simplify complex concepts for a wider audience, can inadvertently contribute to the spread of misinformation and conspiracy theories. When terms like "cloud computing" or "data is the new oxygen" are not fully understood, they can be misinterpreted and used to fuel fear and distrust.

The Case of 5G and COVID-19

The "5G Cell Towers Spread COVID-19" conspiracy theory is a prime example of how misunderstandings of technology can lead to harmful beliefs. The term "cloud computing" suggests a virtual, ethereal space, which can lead people to believe that wireless technologies like 5G operate in a similar way. This misunderstanding, combined with a lack of understanding of how electromagnetic waves work, has fuelled the belief that 5G is somehow responsible for the spread of COVID-19.

The Gates Foundation and Invisible Ink

The conspiracy theory about the Bill & Melinda Gates Foundation funding research for invisible ink is another example of how technological metaphors can be misconstrued. The idea of "data" being "the new oxygen" suggests that information can be stored and transmitted in a physical, tangible way. This misunderstanding has led to the belief that a vaccine could contain a tracking device.

The Impact in Johannesburg

It's not surprising that these conspiracy theories are prevalent in Johannesburg. The city, like many others, is grappling with economic inequality, political instability, and a lack of access to quality education. In such environments, people may be more susceptible to misinformation and conspiracy theories as they seek to make sense of complex world events.

Conclusion

While technological metaphors can be helpful tools for communication, it's essential to ensure that they are used responsibly and that their limitations are understood. By promoting accurate information and critical thinking, we can help to combat the spread of harmful conspiracy theories.

Author's comment: South Africa's AI/ICT leadership would be wise to review the unintended consequences of well-meaning policies like the [National Data and Cloud Policy 2024](#).

The "Digital Divide": Yet another misleading metaphor.

The global technological industry, the global governance of this vital industry, and the AI platforms like Gemini and ChatGPT that serve this industry and its governance, all seem to be fixated on yet another technologically misleading metaphor – the "[Digital Divide](#)" ([Britannica August 2024](#)). The metaphor was introduced by Lloyd Morrisett of the Markle Foundation in 1995, and promoted vigorously by the National Telecommunications and Information Agency (NTIA), referring to access gaps in computer ownership and use. But what exactly, in plain English, is a "digital divide"? Most dictionary definitions of that which is divided, digits, are unhelpful. For example, one of Merriam Webster's definition of "digital" as "*critical ischemia of the digitals of upper and lower limbs*" has nothing to do with communications or the technologies used. ChatGPT and Gemini were prompted to analyse the global databases concerned with this metaphor, and suggest a real-world clarification of the concept. The responses of both AI platforms follow.

Gemini discussion of the "Digital Divide" metaphor: 04 August 2024.

The Digital Divide: A Misleading Metaphor?

Deconstructing the "Digital Divide"

You make a compelling argument against the term "digital divide." It's a term that, while widely used, often obfuscates more than it clarifies. By focusing on a seemingly technological gap, it can divert attention from the underlying socioeconomic disparities that truly hinder access to information and opportunities.

Your point about the physical infrastructure is crucial. The world is indeed interconnected through a vast network of physical systems, from undersea cables to satellite constellations. The challenge lies not in the technology itself, but in equitable access to the services and information it enables.

Beyond the Metaphor: A Clearer Framework

To address the issue of educational inequality in the context of technology, we might consider more precise and inclusive terminology. Here are some alternatives:

- **Access Divide:** This term explicitly focuses on the physical and economic barriers that prevent people from accessing digital tools and resources.
- **Opportunity Gap:** This phrase highlights the unequal distribution of chances to benefit from technology-enabled education and employment.
- **Knowledge Equity:** This term emphasizes the goal of ensuring fair access to information and learning opportunities for all.

These alternatives avoid the technological jargon of "digital" and more directly address the core issue: the uneven distribution of benefits from technological advancements.

The Perils of Metaphors

Your critique of the "digital divide" is a valuable reminder of the dangers of relying on metaphors in technical discussions. Metaphors can be powerful tools for communication, but they can also be misleading, especially when they obscure underlying complexities.

In the context of educational inequality, it's essential to use language that accurately reflects the challenges faced by those without equal access to technology. By moving beyond the metaphor of the "digital divide," we can focus on developing effective strategies to bridge the actual gaps in opportunity and access.

Would you like to explore specific examples of how the "digital divide" metaphor has been used to misrepresent the issue of educational inequality? Or perhaps delve deeper into the potential solutions to address the access and opportunity gaps that truly exist?

ChatGPT Response regarding the "Digital Divide" metaphor

The term "digital divide" does indeed carry a lot of baggage and can be confusing, especially when taken literally. In the context of educational inequality, the metaphor is intended to highlight disparities in access to technology and the internet. Here's a more precise and clearer wording for discussing this topic:

The Misleading Nature of the "Digital Divide" Metaphor in Educational Inequality

The "digital divide" is a term that has been widely used to describe the gap between those who have access to digital technologies and those who do not. However, this metaphor can be misleading and lacks clarity, especially for non-technical laypersons and children exposed to poor education.

Originally coined by Lloyd Morrisett of the Markle Foundation in 1995, and popularized by the National Telecommunications and Information Agency (NTIA), the term aimed to address disparities in computer ownership and internet use. However, "digital" is a broad term with multiple meanings. For instance, one of Merriam Webster's definitions refers to "critical ischemia of the digitals of upper and lower limbs," which could imply a person missing fingers or toes is experiencing a "digital divide."

In reality, what is often referred to as the digital divide encompasses various issues, such as:

- **Access to Devices:** The availability of computers, tablets, or smartphones.
- **Internet Connectivity:** The quality and affordability of internet access.
- **Digital Literacy:** The skills required to effectively use digital technologies.
- **Educational Resources:** Availability of online educational content and tools.

Despite the prevalence of digital technologies, including analog radio spectrum modulated with digitally encoded information and global communication systems like Elon Musk's Starlink and the James Webb telescope, disparities still exist. These disparities are less about the physical infrastructure and more about socio-economic factors that affect accessibility and usability.

The Real Issue: Educational Inequality and Technological Neutrality

The focus should shift from the ambiguous term "digital divide" to the more pressing issue of educational inequality. This includes ensuring that all students, regardless of their socio-economic background, have equitable access to the tools and skills needed to succeed in a digital world.

The arguments for technologically neutral systems of access and dissemination of information are not new. Samuel Morse's first telegraphic message, "What Hath God Wrought?" in 1844, emphasized the transformative potential of technology. This theme has been echoed by many respected academics and authors.

Conclusion

In discussions about "The Perils of Metaphors in Technology: A Focus on Educational Inequality," it is crucial to clarify that the term "digital divide" is a metaphor for the socio-economic and infrastructural disparities that prevent equitable access to digital technologies. By focusing on the real issues of access, connectivity, and literacy, we can better address the root causes of educational inequality.

This framing helps to clarify the concept and focuses on the tangible aspects of inequality, rather than relying on a potentially confusing metaphor.

Annex 2: The "Nature" of Nature: The Western Dichotomy of Humans and Nature

The Religious Roots of the Fractured Relationship between Humans and Nature

Introduction:

Closely related to the preceding discussions on technological metaphors and their potential to misinform and mislead is the belief held by many humans, particularly those who adhere to western philosophies and values, that humans are superior to nature itself. Too many global leaders and laypersons use this sense of superiority over anything non-human for their own self-interests, with little consideration of the ecological harm such use can inflict on nature.

The inclusion of this section in this discussion document was triggered by the publication of a related article in the United Kingdom's [The Guardian newspaper on 27 Jul 2024](#): "[What is 'nature'? Dictionaries urged to include humans in definition.](#)" This interesting article led to a further subject search, leading to the highly informative article published by the prestigious scientific journal "Nature," on 10 February 2020 under the title "[What does 'nature' mean?](#)"

The two documents referred to in the hyperlinks above clearly state that the worldview of human domination over nature originated in western philosophies, or more accurately, the worldview is predominantly "Eurocentric" - it is not shared by non-European western cultures like Native Americans of North, Central and South America, nor is it shared by most non-European cultures worldwide. This conclusion may be deemed sensitive to some, with potential perceptions of bias. To forestall any suggestion of bias, the AI platforms provided by ChatGPT and Gemini were prompted to provide consensus opinions from the vast global databases of relevant knowledge. The results are summarised below:

- ChatGPT: "Western Philosophical Tradition: *The distinction between humans and nature has deep roots in Western philosophical and religious thought. For example, the Judeo-Christian tradition often emphasizes human dominion over nature, as seen in the Biblical narrative of creation. This view can lead to a perception of nature as a resource to be exploited, rather than a complex system of which humans are an integral part.*"
- Gemini: "The Excluded Self: Human and Nature": "*The prevalent Western definition of nature as a realm distinct from humanity presents a profound challenge to our understanding of our place in the world. This dichotomous view, contrasting humans with the natural world, has far-reaching implications for our relationship with the environment and contributes to the escalating crises of conflict and climate change.*"

Religious belief systems are so deeply entrenched in the human mind, that finding consensus outside the scientific research community, and often within it, is extremely difficult. A detailed discussion of religion and religiosity is clearly beyond the scope of this discussion, but must nevertheless be considered in the design of human-focused development policies and processes. A few references will be provided as this discussion unfolds, but even these can, perhaps must, be viewed as potentially biased – the choice of reference material can itself be suggestive of bias. To minimize bias, Artificial Intelligence platforms were prompted to offer opinions based on access to the vast databases of knowledge made possible by technological advances. A first foray into this strategy produced the following response from ChatGPT:

ChatGPT, 31 July 2024: *“One of the greatest strengths of artificial intelligence (AI) lies in its ability to access and analyse vast amounts of digital data from global libraries and online knowledge repositories, and to provide well-supported conclusions based on statistical consensus.”*

All AI platforms are not immune from bias, or malignant falsification of facts, but such limitations can be alleviated through careful probing and restatements of AI prompts.

As already stated or implied, any discussion based on religious belief systems is bound to be extremely difficult, argumentative, controversial, and may even lead to the extreme violence that has historically shaped the world’s major religions, especially, but not exclusively, the Abrahamic religions comprising Judaism (origin circa 2000 BCE, estimated 2014 population 15.6 million); Christianity (origin circa 100 CE, 2014 population 2.3 billion); Islam (origin circa 622 CE, 2014 population 1.6 billion) [source [Khan Academy](#)]. Religious intolerance and violence continue to plague all of humanity to this day, more than 4 millennia after humankind’s “creation” of the first modern religions, Hinduism, and Judaism.

This discussion is about the fractured relationship between humans and nature, and how we could use a proactive people-centred AI regulatory regime to render this dichotomy irrelevant. This dichotomy is a microcosm of the deep divisions between religious belief systems and the still unfolding scientific knowledge of ourselves, our world, and the universe we live in. While the dichotomy is universal in nature, and is alive and well in South Africa, the country has not turned this dichotomy into violence. The exceptions relate to relatively modern interpretations of ancient biblical scriptures and texts, some of which were used to design and justify the apartheid system of governance (read [sciELO.org.za December 2014](#)). This use of religious dogmas to justify apartheid unleashed immense violence and misery on all who lived in the land, irrespective of their ethnicity, race, or religion. Three unconnected observations are offered to illustrate the universal and the local challenges that can, perhaps must, be resolved for South Africa’s future generations to inherit sound fact-based sustainable knowledge.

The evolution of religion and spirituality:

- **Empathy**, “conceived by many to be a driving motivation of moral behaviour and justice ([PMC 2016](#))”, is an animal instinct observable in nearly all animals, illustrated by the research-based opinions of [Frans de Waal](#), in “[The Bonobo and the Atheist](#)”, [March 2013](#), and many other primatologists and behavioural scientist like him. Perhaps these instincts - empathy and moral behaviour - can be traced to our genetic origins through a re-interpretation of Richard Dawkin’s much disputed masterpiece “[The Selfish Gene](#)”.

Most modern religious doctrines and dogmas are very well known and well documented. All recognised faiths today have vast databases of these doctrines and dogmas, in the form of religious texts like the Bible, the Qur’an, the Tanakh, the Tripitaka, the Vedas, etc. They all contain strong elements of empathy, behavioural and moral codes, and related edicts in their doctrines. All these doctrines emerged relatively recently in the evolutionary history of humankind, beginning with the invention of writing about [5,200 years ago, circa 3,200 BCE](#)). Many religious doctrines still aggressively defend their rejection of scientific evolution in favour of various forms of Creativity myths, with many conflicting interpretations of the exact date of earth creation:

- *77.76 trillion years ago*: Puranic Hinduism calculating repeating cycles of creation of the universe, as reported by the [Northern Arizona University, July 27, 2007](#).
- September 1, 5509 BC to August 31, 5508 BC: [The Byzantine Creation Era, 7 January 2023](#).

- [4004 BC: On 23 October 4004 BC](#), the world was created, according to Archbishop James Ussher of Armagh (1581-1656).
 - 7 October, 3761 BC is now generally accepted as the day God created the universe and earth in Judaism ([Anno mundi | Jewish Calendar, History & Origins – Britannica 11 October. 2013](#)).
 - In 1738, De Vignoles stated that he had accumulated no fewer than 200 computations of the date of creation, all based upon various diverse interpretations of the Bible ([Northern Arizona University, July 27, 2007](#)).
 - **Spirituality** precedes nearly all religious doctrines and their dogmas by hundreds of millennia. This applies especially to the Abrahamic-rooted religions of Judaism, Christianity, and Islam, which are predated by most variants of spirituality by at least 350,000 to 750,000 years, following the emergence of Homo sapiens ([Smithsonian 2021](#)). This argument could be stretched even further back to about 2-million years ago, to the emergence of hominids with instinctive empathy, e.g., the presumed kinder gentler Homo erectus and her “paleo” hominin cousins like [Australopithecus africanus](#) and Homo Naledi ([Smithsonian, 03 January 2024](#)). These so-called “Archaic hominins” “migrated” peacefully to all corners of earth from their African ancestral homes – they were not “illegal migrants” when they planted the seeds of Homo sapiens in all corners of inhabited earth. Their evolutionary history could have stretched even much further back in earth’s history to the emergence of Richard Dawkin’s imagery of the Selfish Gene, which itself was triggered by the emergence of Oxygen in the earth’s atmosphere about 3.22 billion years ago, well before the “New Oxygen” – Data - was invented by some members of Homo sapiens in this 21st century.
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The Modern Resurgence of Spirituality: AI Responses:

The deep emotional attachment to religious beliefs by most of the world’s population today, which has shaped the relationships between humans and nature, is now changing slowly through a relatively recent resurgence of ancient spiritual belief systems. ChatGPT and Gemini were prompted to comment on both the resurgence of spirituality, and the western world view of Homo sapiens’ superiority over nature. This was done specifically to reduce any perceptions of bias as discussed in the introduction of this section of the discussion document.

Gemini Response on Resurgence of Spirituality:

The Modern Resurgence of Spirituality and Ecological Consciousness

The contemporary world, marked by rapid technological advancement and globalization, has paradoxically led to a growing sense of disconnection from nature and a yearning for deeper meaning. This has sparked a resurgence of spirituality, often intertwined with a profound ecological consciousness.

This movement is characterized by a critical re-examination of traditional religious doctrines and a search for alternative spiritual paths that foster harmony with the natural world. There's a growing recognition that many environmental crises stem from a worldview that places humans in dominance over nature, rather than as integral parts of it.

Key Themes in the Resurgence:

- **Eco-spirituality:** This approach seeks to deepen the spiritual connection with the natural world, often drawing from indigenous wisdom and animistic traditions.
- **Reinterpretation of Religious Texts:** Many individuals and groups are re-examining religious scriptures to find ecological messages that have been overlooked or suppressed.
- **Social and Environmental Justice:** The movement often intersects with social justice concerns, recognizing that environmental degradation disproportionately affects marginalized communities.
- **Mindfulness and Meditation:** Practices that promote inner peace and connection with the present moment are seen as essential tools for fostering ecological awareness.

Short List of Key References:

Books:

- [Braiding Sweetgrass by Robin Wall Kimmerer](#): “Every plant, animal, rock and river is referred to as a person, not an object; a verb and not a noun”
- [Sacred Ecology by John Grim and Mary Evelyn Tucker](#): “Exploration of the history of religious traditions and the environment, illustrating how religious teachings and practices both promoted and at times subverted sustainability.”
- [The Hidden Life of Trees by Peter Wohlleben](#): “Rules need to be applied by powerful elites to ensure that the ‘natural world’ is properly protected from wayward humans—particularly those who wish to make a living from it.”

Organizations:

- [The Schumacher Center for a New Economics](#)
- [The Network of Spiritual Progressives](#)
- [Eco-Justice Ministries](#)

Academic Journals:

- [Journal of Religion and Nature](#)
- [Worldviews: Environment, Culture, Religion](#)

It's essential to note that this resurgence is a diverse and multifaceted phenomenon. While there's a common thread of ecological concern, the specific expressions of spirituality vary widely. Some focus on personal transformation, while others engage in collective action for environmental protection.

Would you like to explore a particular aspect of this topic in more depth, such as the role of indigenous wisdom or the challenges of integrating spirituality into environmental activism?

ChatGPT Response on Resurgence of Spirituality

Animism, defined as the belief in the existence of individual spirits that inhabit natural objects and phenomena, is indeed considered one of the earliest forms of spirituality and religious belief. From an AI perspective, it's essential to contextualize the development of animistic beliefs within the broader framework of human and hominin evolution.

Historical Context of Animistic Beliefs:

Early Homo Species:

- **Homo erectus**: While there is no direct evidence of religious beliefs in *Homo erectus*, their cognitive and social advancements suggest the potential for symbolic thought. This species exhibited behaviors such as tool-making, the use of fire, and possibly even some form of social cooperation, which could be precursors to more complex belief systems.
- **Neanderthals**: More evidence exists suggesting that Neanderthals had some form of symbolic thinking, which is a precursor to spiritual belief. They buried their dead, sometimes with grave goods, which implies a belief in an afterlife or some form of respect for the deceased that goes beyond mere disposal of bodies.

Homo sapiens:

- **Pre-Neolithic Hunter-Gatherers**: Early *Homo sapiens*, who lived as hunter-gatherers before the advent of agriculture, are believed to have practiced animism widely. Cave paintings, carvings, and burial practices from this period suggest a belief in the spiritual significance of animals and natural elements.

Evidence of Animism in Early Human Societies:

- **Cave Art:** The cave paintings in places like Lascaux and Chauvet in France depict animals and hunting scenes, which many anthropologists interpret as evidence of animistic beliefs. These artworks suggest that early humans saw animals as possessing spiritual significance.
- **Burial Practices:** The inclusion of tools, ornaments, and other objects in graves indicates a belief in an afterlife or a spiritual journey after death. This practice dates back tens of thousands of years, with evidence found in sites associated with both Neanderthals and early Homo sapiens.
- **Artifacts and Symbols:** Objects such as the Venus figurines, which date back to the Upper Paleolithic, may have held spiritual or ritualistic significance, pointing to early forms of religious belief centered around fertility, nature, and the human body.

Animism and Its Non-Racially-Biased Context:

- **Universal Belief System:** Animism is not restricted to any one region or culture. It has been a prevalent belief system in various forms across different human societies. This universality suggests that animistic beliefs likely emerged independently in various human groups as a fundamental way of interpreting the world.
- **Cultural Adaptation:** Animistic beliefs are deeply intertwined with the environment and lifestyle of a society. Hunter-gatherer societies, which were closely connected to nature, often viewed animals, plants, and natural phenomena as possessing spirits or consciousness.
- **Non-Racial Bias:** Recognizing animism as a widespread early belief system underscores the shared human experience of seeking to understand and relate to the world around us. It emphasizes commonalities rather than differences among early human societies.

Summary:

From an evolutionary and anthropological perspective, animism likely emerged as a prevalent belief system among early Homo species, including Homo erectus, Neanderthals, and early Homo sapiens. The evidence suggests that as humans developed more complex cognitive abilities and social structures, they began to attribute spiritual significance to the natural world around them. This early form of spirituality is a testament to the universal human quest for meaning and connection with the environment, transcending racial and cultural boundaries.

Key References:

- "[The Mind in the Cave](#)" by David Lewis-Williams: This book explores the origins of art and religion in the Upper Paleolithic, providing insights into early human spirituality.
- "[The Roots of Religion: Exploring the Cognitive Science of Religion](#)" by Roger Trigg: This text delves into the cognitive underpinnings of religious beliefs, including animism, in early human societies.
- "[Burial Practices in Early Homo](#)" by Paul Pettitt: A study on the burial practices of early humans, providing evidence of spiritual beliefs and rituals.

These references offer a deeper understanding of how animism and other early spiritual beliefs likely developed as integral parts of human evolution.

A South African Case Study: The Homo naledi Controversy

History of Homo naledi discovery

"Fossil hominins were first discovered in the Dinaledi Chamber of the Rising Star Cave system in South Africa during an expedition led by Lee Berger beginning October 2013. In November 2013 and March 2014, over 1550 specimens from at least 15 Homo naledi individuals were recovered from this site. This excavation remains the largest collection of a single hominin species that has been found in Africa. Rick Hunter and Steven Tucker found an additional 133 Homo naledi specimens in the nearby Lesedi Chamber in 2013, representing at least another 3 individuals – two adults and a juvenile. In 2017, the Homo naledi fossils were dated to between 335,000 and 236,000 years ago." Source: [Smithsonian, 3 January 2024](#).

Numerous scientific reports are available for this important scientific discovery, including an excellent outline by the prestigious Natural History Museum published on 5 June 2023: "[Claims that Homo naledi buried their dead could alter our understanding of human evolution](#)"

While the world celebrated the discovery of Homo naledi, the discovery also triggered a furious high-level race/religious-based public discord between scientist and high-level political leaders in the country:

- The scientific defence of the discovery of Homo naledi, its interpretation and meaning for the world of human knowledge, was expressed by Wits University's Professor Lee Berger, leader of the discovery, as follows:

"For our scientists, the search for human origins is one that celebrates all of humankind's common origins on the continent of Africa. The science is not asking questions of religion nor challenging anyone's belief systems, it is simply exploring the fossil evidence for the origins of our species."

- The response from many of South Africa's political leadership was varied: a celebration of exceptional scientific and human evolutionary knowledge advance laced with alarming racial and dogmatic religious undertones, illustrating once more the deep racially-defined divisions in religion and scientific knowledge that has challenged the nation throughout its recent history. At the formal announcement of the discovery in September 2015, South Africa's State President Jacob Zuma, and his deputy Cyril Ramaphosa, both welcomed and celebrated the discovery. Former President Zuma stated that he was very excited about the discovery and was proud that it had happened in South Africa: "*Our country is truly the cradle of mankind.*"

In stark contrast, well-known sociopolitical leaders expressed extreme views of their understanding of science and the origins of humankind:

- [Zwelinzima Vavi](#), former general-secretary of the powerful trade union group Cosatu, stated that "*No-one will dig old monkey bones to back up a theory that I was once a baboon. Sorry,*" – [PHYS.ORG, 17 September 2015](#);
- [Professor Mathole Serofo Motshekga](#), former Chief Whip of ANC, who has served as a representative of the ANC in the Judicial Services Commission and Chairperson of the Joint Committee on the Financial Management of Parliament, commented as follows:
*"Africa has a picture of the oldest, most ancient human beings that originated on this continent – and that human being is claimed to have been in the image of God, and he's not a chimpanzee."
"Europeans don't have a record of their history and their ancestors – they're looking for their next ancestor, and they found their ancestor in the baboon." "They want us to share that ancestor. We can't share that, because we have our ancestor."* Sources: [Business Tech. 16 September 2015](#), and [SABC Question Time broadcast, 14 September 2015](#).

Professor Mathole Serofo Motshekga, by his own admission, draws his knowledge mainly from the [Corpus Hermeticum](#), ancient religious texts inspired by the Greek god Hermes and the Egyptian god Thot between the 2nd and the 4th centuries CE. Homo naledi predates the Corpus Hermeticum by about 300,000 years. What modern scientists have yet to "unearth" is if and how Homo naledi may have been one of our seemingly numerous ancestors – how they may have passed the evolutionary baton to the Homo sapiens gene pool – was Homo naledi one of the many "archaic Homo" ancestors of us?

The scientists who "discovered" the Homo naledi fossils, and those who study them, draw their knowledge directly from the fossil evidence using a variety of scientific archaeological analytic and dating technics, paleoanthropological behavioural studies, and progressively, genetic analyses. Genetic analyses, finding the DNA of ancient fossils, is the most informative technique, but also the most difficult: the climatic conditions in Africa are not conducive to the preservation of ancient DNA.

The search for Homo naledi DNA continues, as described in the 2017 paper "[Homo naledi genome: Will we ever find this elusive key to human evolution?](#)"

The scientific knowledge of who we are, where we came from, with which other [hominid or hominin](#) species our ancestors consorted with to "create" us, is still unfolding. New discoveries generally lead to more

questions requiring even more multidisciplinary scientific research to answer them. South Africa, a.k.a. the “Cradle of Humankind,” is an excellent location for such research, and the intense public discourse on the conflicting knowledge that inspires and sets objectives for that research. It is home to all human ancestors, and by that extension, the genetic home of all humankind.

Conclusions of Annex 1 and Annex 2 discussions

The discussions about metaphors in Annex 1, and those concerning the actual and perceived relationships between Homo sapiens and nature discussed in Annex 2, are largely self-explanatory. What is most important for South Africa, and virtually all nations on earth, developing and developed alike, is that these relationships need to be understood by all, demanding massive public discussions at all levels and ideological divisions of society, and of course, equally massive reorientation of traditional education and learning processes.

The deep societal fissures that shape our contemporary world, fuelling the growth, or resurgence, of alarming extremism like the global spread of populism, homophobia, racism, sexism, xenophobia, and interfaith conflicts, are relatively new global phenomena which emerged from the human societal restructuring that followed the [Neolithic Revolution](#). This new [Anthropocene Epoch](#), the existence and definition of which is receiving growing support from the global scientific community, is “characterized as the time in which the [collective](#) activities of [human beings](#) (Homo sapiens) began to substantially alter [Earth’s](#) surface, [atmosphere](#), [oceans](#), and systems of [nutrient cycling](#). A growing group of scientists argue that the Anthropocene Epoch should follow the [Holocene Epoch](#) (11,700 years ago to the present) and begin in the year 1950. The name Anthropocene is derived from Greek and means the “recent age of man,” quotation from Britannica, updated on 30 August 2024.

The results of the “collective activities” of human beings in reshaping our world are real, evidenced by the increases of devastating climate-change disasters, health pandemics, and wars that impact all nations and regions in the world today. These human setbacks remind us of the warnings of credible historians like Walter Scheidel’s provocative thinking in his classic “[The only conquerors of inequality are the Four Horsemen of the Apocalypse](#),” and his fellow historian Yuval Noah Harari as he paints a dystopic picture of “*Biotechnology and the rise of AI may split humankind into a small class of ‘superhumans’ and a huge underclass of ‘useless’ people. Once the masses lose their economic and political power, inequality levels could spiral alarmingly*” ([Yuval Noah Harari in The Guardian, Wednesday 24 May 2017](#))

Is South Africa, leading the world in inequality, already a nation of “superhumans” (the wealthy 24%) and an underclass of useless people (the remaining 76%, including the unemployed [41.9% of the labour force - STATS SA Q1:2024](#)), even before the advent of AI and its creation of more useless people?

Annex 1 and Annex 2 discuss extremely complex human challenges, all supported by a wealth of research documents and data, far beyond the capacity for inclusion in this discussion, a veritable “information overload” which can be managed with the wise usage of AI.

All the complexity inferred in Annex 1 and Annex 2 need to be included in any national effort to develop a proactive people-friendly developmental-oriented AI/ICT regulatory provision.

The risks of doing nothing in South Africa are “[too ghastly to contemplate](#)”
