Journal of
Philosophy, Culture and Religion
(JPCR)

Ethical Implications of Emerging Technologies and Scientific Discoveries for Human Dignity and Rights in Rwanda

Kelly Kalisa

IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING

Journal of Philosophy, Culture and Religion
ISSN 2520-0445 (Online)
Vol.7, Issue 1, No. 4, pp 35- 45, 2024

IPRJB
INTERNATIONAL PEER REVIEWED JOURNAL AND BOOK PUBLISHING

www.iprjb.org

Ethical Implications of Emerging Technologies and Scientific Discoveries for Human Dignity and Rights in Rwanda

Kelly Kalisa

Article History

Received 21st January 2024

Received in Revised Form 30th January 2024

Accepted 4th February 2024

How to Cite

Kalisa, K. (2024). Ethical Implications of Emerging Technologies and Scientific Discoveries for Human Dignity and Rights in Rwanda. *Journal of Philosophy, Culture and Religion*, *7*(1), 35 – 45. https://doi.org/10.47604/jpcr.2343

Abstract

Purpose: The aim of the study was to investigate ethical implications of emerging technologies and scientific discoveries for human dignity and rights in Rwanda

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: The ethical implications of emerging technologies in Rwanda raise concerns regarding privacy, autonomy, and equitable access. While these advancements offer potential benefits, careful consideration is needed to ensure they uphold human dignity and rights for all citizens.

Unique Contribution to Theory, Practice and Policy: Ethical framework of utilitarianism, deontological ethics of immanuel kant & ethical theory of virtue ethics may be used to anchor future studies ethical implications of emerging technologies and scientific discoveries for human dignity and rights in Rwanda. Integrate ethical considerations into the design phase of emerging technologies to proactively address potential ethical challenges. Implement regulatory mechanisms that govern the ethical development and use of emerging technologies, taking into account principles such as privacy, autonomy, fairness, and non-discrimination.

Keywords: *Ethical Implications, Emerging Technologies, Scientific Discoveries, Human Dignity, Rights*

INTRODUCTON

The impact of economic, social and cultural rights on human dignity and rights is significant, as these rights are essential for the well-being, development and empowerment of individuals and communities. However, these rights are often neglected, violated or undermined by policies and practices that prioritize profit over people, or that discriminate against certain groups based on their identity, status or location. In developed economies like the USA, Japan, and the UK, the increasing integration of advanced technologies, particularly in healthcare, has had a profound impact on human dignity and rights. One example is the widespread adoption of Electronic Health Records (EHRs) in the United States. While EHRs enhance patient care by providing quick access to medical history and facilitating information sharing among healthcare providers, concerns about privacy have arisen. According to a study by Adler-Milstein (2017), there were over 1,500 breaches of EHRs reported in the United States in 2016 alone, potentially compromising patient privacy and autonomy. This underscores the importance of robust data security measures and ethical considerations in healthcare technology to safeguard patients' rights. In the USA, millions of people lack adequate health care coverage, resulting in preventable deaths, illnesses and bankruptcies. According to a study by the Commonwealth Fund, the USA ranked last among 11 high-income countries in terms of health care access, equity, quality and outcomes in 2020. In Japan, women face persistent gender inequality in the labor market, education and political representation. According to the World Economic Forum, Japan ranked 120th out of 156 countries in the Global Gender Gap Index 2021. Women also face widespread sexual harassment and violence, with only 4% of rape cases reported to the police. In the UK, austerity measures have eroded the social safety net and increased poverty, especially among children, ethnic minorities and disabled people. According to the Joseph Rowntree Foundation, 14.5 million people were living in poverty in the UK in 2019/20, including 4.3 million children. The UN Special Rapporteur on extreme poverty and human rights found that the UK government had inflicted "great misery" on its people with "punitive, mean-spirited and often callous" policies.

Similarly, in Japan, the growing use of robotics and artificial intelligence (AI) in elder care is transforming the healthcare landscape. On the one hand, this technology assists in providing efficient care and maintaining the autonomy of elderly individuals, allowing them to age in place. However, ethical concerns arise regarding the potential depersonalization of care when robots replace human caregivers. A study by Aoki (2018) highlights that while 84% of elderly individuals using AI-based care systems in Japan feel more secure, some also express concerns about the loss of human connection and its impact on their dignity. Balancing the benefits of AI with preserving the human aspects of care is an ongoing challenge in developed economies.

Now, shifting our focus to developing economies, a significant impact on human dignity and rights can be observed in the context of biometric identification systems. In India, for instance, the implementation of the Aadhaar system, which assigns a unique biometric ID to each citizen, has transformed access to various services. On one hand, this initiative has improved financial inclusion, reduced identity fraud, and streamlined the distribution of government benefits. However, concerns about privacy and autonomy have been raised, particularly regarding the potential misuse of biometric data. A study by De, Bhati, and Malik (2018) highlights the need for robust data protection laws and ethical considerations to safeguard citizens' rights in the digital age. In Nigeria, the use of biometrics in voter identification systems has also raised ethical and

privacy concerns. While biometric voter registration aims to enhance the integrity of elections, the collection and storage of citizens' biometric data have sparked debates about individual autonomy and privacy rights. A study by Olaniyan and Solomon (2017) emphasizes the importance of a legal framework that balances the benefits of biometric voter registration with the protection of citizens' rights, illustrating the ongoing challenges faced by developing economies in this regard.

Moving on to Sub-Saharan economies, the impact on human dignity and rights is evident in the context of mobile banking and financial services. In Kenya, the widespread adoption of mobile money platforms like M-Pesa has increased financial access and inclusion for many citizens, particularly in rural areas. However, the collection and analysis of user data by service providers raise concerns about privacy and data security. A study by Gitau (2018) highlights the need for transparent data policies and informed consent to protect users' rights in the digital financial ecosystem. In South Africa, the use of biometrics in identity verification processes has been introduced in various sectors, including healthcare and social services. While biometrics can enhance efficiency and reduce fraud, ethical questions arise concerning the security and responsible use of biometric data. A study by Zaidi (2019) emphasizes the importance of establishing clear ethical guidelines and data protection measures to ensure the dignity and privacy of individuals participating in these systems.

Nigeria, the use of biometrics has extended beyond voter registration to various sectors, including national identification programs. The National Identity Number (NIN) system, which relies on biometric data, aims to streamline government services, enhance security, and reduce identity fraud. However, the mass collection of biometric information has sparked concerns about data security and privacy. A study by Eke (2020) highlights the importance of stringent data protection regulations and transparent data handling procedures to ensure the ethical use of citizens' biometric data in Nigeria, emphasizing the need to strike a balance between technological advancement and individual rights.

In Rwanda, the government has introduced a digital identity system called "Irembo," which allows citizens to access various government services online. While this initiative has increased efficiency and convenience, ethical considerations emerge regarding the digital divide and access to technology. A study by Uwizeyimana and Mutanga (2018) underscores the importance of ensuring equitable access to digital services to prevent the exclusion of vulnerable populations and to uphold the principles of human dignity and equality in the digital age. In South Africa, the rapid expansion of smart cities and digital infrastructure has led to increased urbanization and improved access to services. However, the deployment of technologies such as facial recognition for security and surveillance purposes has raised concerns about privacy and individual autonomy. A study by Mthembu (2021) highlights the need for robust data protection laws and ethical guidelines to regulate the use of biometric technologies in smart city initiatives. This underscores the importance of preserving the fundamental rights of citizens while embracing technological progress.

In Kenya, the advent of biometric identification for accessing social services has improved the efficiency and transparency of government programs. For instance, the Huduma Namba project introduced a unique identification number for citizens. Nevertheless, ethical considerations have emerged regarding informed consent and data ownership. Research by Kanyiri (2020) underscores the significance of ensuring that individuals are well-informed about the use of their biometric data and have control over how it is utilized to safeguard their dignity and privacy rights.

Introduction and adoption of emerging technologies and scientific discoveries have always been pivotal in shaping societies and cultures worldwide. Among the most likely emerging technologies in the near future are advancements in artificial intelligence (AI), gene editing technologies like CRISPR-Cas9, quantum computing, and renewable energy innovations. These technologies hold immense promise in revolutionizing various aspects of human life, from healthcare and communication to energy production and environmental conservation. However, with their introduction comes a host of ethical considerations that can significantly impact human dignity and rights. For instance, the use of AI raises concerns about privacy infringement through surveillance systems and algorithmic biases, potentially leading to discrimination and erosion of autonomy (Sarathy & Robertson, 2022).

Furthermore, gene editing technologies such as CRISPR-Cas9 pose complex ethical dilemmas surrounding the manipulation of the human genome, including issues related to informed consent, genetic discrimination, and equitable access to treatment. Quantum computing, while offering unprecedented computational power, also raises questions about data security and the potential for misuse in surveillance or cryptography. Additionally, advancements in renewable energy technologies have the potential to mitigate climate change and reduce dependence on fossil fuels, but may also disrupt existing socio-economic structures and exacerbate inequalities in access to resources (Vijayakumar, 2021). Therefore, as society embraces these emerging technologies, it is imperative to critically evaluate their ethical implications and ensure that they are deployed in a manner that upholds human dignity, protects individual rights, and fosters equitable access and distribution of benefits.

Problem Statement

The ethical implications of emerging technologies and scientific discoveries for human dignity and rights are complex and multifaceted. Emerging technologies, such as the semantic web, biometrics, grid computing, and new computing technologies, offer great promise for enhancing human security, communication, and well-being, but also pose significant challenges for privacy, autonomy, justice, and democracy (Rundle and Conley 2007; Wolff 2014; Hansson 2020). These technologies often operate in a moral, legal, and social vacuum, where the risks and benefits are uncertain, the regulation is inadequate, and the public participation is limited (Moor 2005; Edwards 1991). Therefore, it is necessary to adopt a precautionary approach that considers the potential harms and benefits of these technologies, as well as their compatibility with human values and rights (Wolff 2014). Moreover, it is essential to promote ethical awareness and dialogue among the stakeholders involved in the development, deployment, and use of these technologies, such as scientists, policy makers, civil society, and users (UNESCO 2007; Kendal 2022). A democratic information society requires not only technological innovation, but also ethical reflection and social responsibility (Reed 2006).

Theoretical Framework

Ethical Framework of Utilitarianism

Originated by Jeremy Bentham and further developed by John Stuart Mill, utilitarianism posits that the ethicality of an action should be judged based on its ability to maximize overall happiness or utility within society. In the context of emerging technologies and scientific discoveries, utilitarianism offers a consequentialist approach to assessing the ethical implications. It prompts

researchers and policymakers to consider the potential benefits and harms of these advancements for human dignity and rights, weighing the overall societal welfare against individual interests (Singer, 1972).

Deontological Ethics of Immanuel Kant

Immanuel Kant's deontological ethics emphasizes the importance of moral duties and principles that are inherently binding, regardless of their consequences. Central to Kant's philosophy is the notion of treating individuals as ends in themselves, rather than merely as means to an end. Applied to the ethical implications of emerging technologies, Kantian ethics underscores the significance of respecting human autonomy, dignity, and rights as categorical imperatives, guiding ethical decision-making in the development and deployment of new technologies (Kant, 1785).

Ethical Theory of Virtue Ethics

Originating from Aristotle's works, virtue ethics focuses on the development of virtuous character traits and habits to guide ethical behavior. Unlike utilitarianism and deontology, virtue ethics prioritizes the cultivation of moral virtues such as compassion, honesty, and integrity. In the realm of emerging technologies and scientific discoveries, virtue ethics encourages researchers, engineers, and policymakers to embody ethical virtues in their work, promoting responsible innovation that upholds human dignity and respects fundamental rights (MacIntyre, 1981).

Empirical Review

Smith (2018) sought to comprehensively unpack the privacy concerns that accompany the pervasive adoption of facial recognition technology in public spheres. Through a meticulously designed mixed-methods approach that encompassed surveys probing public perceptions and in-depth interviews delving into nuanced viewpoints, the researchers unearthed a rich tapestry of attitudes. While respondents voiced legitimate apprehensions regarding potential privacy infringements posed by facial recognition systems, they also articulated a conditional acceptance of the technology, contingent upon factors such as transparency in its operation and individual agency in its utilization. Importantly, the study's recommendations underscored the imperative for the establishment of robust privacy regulations and the implementation of extensive public education initiatives to effectively address these concerns while ensuring the responsible deployment of facial recognition systems in public domains.

Jones (2019) embarked on a profound qualitative exploration of the multifaceted ethical considerations entailed in the utilization of CRISPR-Cas9 gene editing technology on human embryos. Through immersive interviews with an array of stakeholders spanning scientists, ethicists, and policymakers, the study illuminated a spectrum of viewpoints regarding safety, consent, and broader societal implications of genetic manipulation. Findings from this insightful research underscored the urgent need for the development of nuanced ethical frameworks that navigate the delicate balance between scientific advancement and ethical responsibility.

Garcia (2020) delved into the profound ethical ramifications of artificial intelligence (AI) algorithms within the realm of hiring practices. Employing a multifaceted mixed-methods approach involving quantitative analysis of hiring data and qualitative interviews with human resources (HR) professionals, the study shed light on pervasive concerns surrounding algorithmic bias and the potential for discriminatory outcomes in employment decisions. Recommendations put forth included advocating for algorithm transparency and the implementation of

comprehensive diversity training programs for HR personnel to effectively mitigate these ethical challenges. Collectively, these rigorous empirical endeavors furnish invaluable insights and recommendations aimed at ensuring that emerging technologies uphold human dignity and rights in their development and implementation, serving as indispensable guideposts for navigating the intricate ethical landscape of technological progress.

Wang (2019) investigated into the ethical considerations surrounding the use of big data analytics in healthcare, focusing on issues such as data privacy, informed consent, and the potential for algorithmic biases. Their findings underscored the importance of implementing robust data governance frameworks and ensuring transparency in data processing to safeguard patient rights and autonomy. Similarly, Wang et al. explored the ethical challenges posed by the integration of Internet of Things (IoT) devices in smart cities, highlighting concerns related to data security, surveillance, and the erosion of privacy in urban environments. Their study emphasized the need for ethical guidelines and regulatory mechanisms to govern the responsible deployment of IoT technologies while preserving individual freedoms and rights. These empirical investigations contribute valuable insights and recommendations to inform ethical decision-making and policy development in the rapidly evolving landscape of emerging technologies, ensuring that human dignity and rights remain paramount considerations in technological innovation.

Li (2021) delved deeply into the ethical considerations surrounding the burgeoning utilization of big data analytics in healthcare settings. Employing a systematic review methodology, their study meticulously examined a wide array of ethical dimensions, including issues pertaining to data privacy, informed consent, and the potential for algorithmic biases. Through their rigorous analysis, Li et al. illuminated the multifaceted ethical challenges inherent in harnessing big data for healthcare purposes, highlighting the critical importance of implementing robust data governance frameworks and ensuring transparency in data processing to safeguard patient rights and autonomy.

Park (2018) conducted a nuanced exploration of the ethical challenges stemming from the integration of wearable health monitoring devices in healthcare settings. Utilizing qualitative research methods, including interviews and focus groups with healthcare professionals and patients, their study delved into multifaceted issues such as data privacy, patient autonomy, and the ethical responsibilities of healthcare providers. By unpacking the complexities surrounding the use of wearable health technologies, Park et al. highlighted the necessity for robust ethical guidelines and patient-centered approaches in healthcare practice. Their research emphasized the imperative of addressing concerns related to data security, informed consent, and the ethical use of wearable health monitoring devices to uphold patient rights and autonomy.

Chang (2020) undertook a comprehensive examination of the ethical considerations surrounding the utilization of artificial intelligence (AI) in autonomous vehicles. Employing a mixed-methods approach encompassing surveys and interviews with stakeholders, their research provided illuminating insights into the ethical dilemmas inherent in autonomous driving systems. Through their meticulous analysis, Chang et al. delineated issues pertaining to safety, accountability, and decision-making algorithms in AI-driven vehicles. Their findings underscored the paramount importance of establishing clear ethical guidelines and regulatory frameworks to ensure the safe and ethical deployment of autonomous vehicles on public roads.

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low-cost advantage as compared to field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

FINDINGS

The results were analyzed into various research gap categories that is conceptual, contextual and methodological gaps

Conceptual Research Gap: While the studies by Smith (2018) and Garcia (2020) extensively explore the ethical implications of emerging technologies such as facial recognition systems and AI algorithms, there appears to be a gap in understanding the long-term societal and ethical implications of these technologies beyond immediate concerns. Further research could delve into the broader philosophical and ethical implications, examining how these technologies shape societal norms, perceptions of privacy, and notions of autonomy over time.

Contextual Research Gap: Despite the comprehensive examination of ethical considerations in specific domains such as healthcare (Li, 2021; Park, 2018) and transportation (Chang, 2020), there seems to be a gap in understanding the intersectionality of these ethical concerns across different sectors. For instance, while Li (2021) delve into the ethical implications of big data analytics in healthcare, there is limited exploration of how similar ethical challenges manifest in other sectors such as finance or education. Future research could explore the contextual nuances of ethical dilemmas across various domains, identifying commonalities and differences to inform more comprehensive ethical frameworks.

Geographical Research Gap: The studies by Jones (2019) mentioned predominantly focus on ethical implications within Western contexts, with limited geographical diversity. While the ethical considerations surrounding emerging technologies may vary across different cultural and geographical contexts, the existing literature fails to adequately address this diversity. Future research could expand beyond Western-centric perspectives to include a more diverse range of cultural, social, and political contexts, providing insights into how ethical concerns manifest and are addressed in different regions of the world.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The ethical implications of emerging technologies and scientific discoveries for human dignity and rights are complex and multifaceted, requiring careful consideration and proactive measures to ensure that advancements in technology do not inadvertently undermine fundamental human values. Through a critical examination of various studies, it becomes evident that emerging technologies such as artificial intelligence, biotechnology, and surveillance systems have the potential to significantly impact individual autonomy, privacy, and societal norms. Issues such as algorithmic bias, data privacy breaches, and the potential for discrimination highlight the importance of developing robust ethical frameworks and regulatory mechanisms to safeguard human dignity and rights in the face of technological progress. Moreover, the ethical considerations surrounding emerging technologies extend beyond immediate concerns to encompass broader societal implications, including equity, justice, and the distribution of benefits

and risks. As technologies continue to evolve and permeate various aspects of daily life, it is imperative to engage in interdisciplinary dialogue and collaboration to address emerging ethical challenges comprehensively. This requires active participation from stakeholders across academia, industry, government, and civil society to ensure that technological innovation is guided by ethical principles and respect for human dignity.

Furthermore, the geographical and cultural diversity of ethical perspectives must be taken into account to develop contextually relevant ethical frameworks that reflect the values and norms of diverse communities worldwide. By fostering transparency, accountability, and inclusivity in the development and deployment of emerging technologies, it is possible to harness their potential for positive societal impact while mitigating potential risks and safeguarding human dignity and rights for present and future generations. In essence, the ethical implications of emerging technologies and scientific discoveries for human dignity and rights underscore the need for ongoing reflection, dialogue, and action to navigate the intricate ethical landscape of technological advancement responsibly. Only through concerted efforts to prioritize ethical considerations can we ensure that emerging technologies contribute to a more equitable, just, and dignified future for all individuals and communities.

Recommendation

Theory

Encourage collaboration among ethicists, technologists, social scientists, and policymakers to develop theoretical frameworks that integrate ethical considerations into the design, development, and deployment of emerging technologies. This interdisciplinary approach can lead to a deeper understanding of the complex ethical dilemmas posed by emerging technologies. Encourage researchers and practitioners to critically reflect on the ethical implications of their work, considering not only immediate consequences but also long-term societal impacts. This reflexivity can help identify potential ethical pitfalls and guide ethical decision-making throughout the technological development process.

Practice

Integrate ethical considerations into the design phase of emerging technologies to proactively address potential ethical challenges. This may involve implementing ethical design principles, conducting ethical impact assessments, and involving diverse stakeholders in the design process to ensure that technologies are developed in ways that respect human dignity and rights. Promote transparency in the development and deployment of emerging technologies by disclosing information about data collection, algorithms, and decision-making processes. Establish mechanisms for accountability to hold developers and deployers of technologies responsible for any ethical breaches that may occur.

Policy

Implement regulatory mechanisms that govern the ethical development and use of emerging technologies, taking into account principles such as privacy, autonomy, fairness, and non-discrimination. These frameworks should be flexible enough to adapt to rapid technological advancements while upholding fundamental human rights and values. Foster collaboration among governments, international organizations, and civil society to develop global standards and guidelines for the ethical use of emerging technologies. This can help address ethical challenges

that transcend national boundaries and ensure consistency in ethical practices across different regions.

REFERENCES

Adler-Milstein, J., DesRoches, C. M., Kralovec, P., Foster, G., Worzala, C., Charles, D., & Searcy, T. (2017). Electronic Health Record Adoption In US Hospitals: Progress Continues, But Challenges Persist. Health Affairs, 36(8), 1653-1660. doi:10.1377/hlthaff.2017.0447

Aoki, K., Sakai, M., & Oshio, T. (2018). The Impact of Artificial Intelligence on Medical Care in Japan: A Robot Caregiver Perspective. Health Informatics Journal, 24(4), 259-270. doi:10.1177/1460458217703735

Choi, I. Y., et al. (2021). "Public perception and ethical concerns regarding gene editing technology in agriculture: A case study in South Korea." Journal of Agricultural and Environmental Ethics, 34(1), 101-121.

De, P., Bhati, D., & Malik, A. (2018). Privacy, Ethics, and Aadhaar: A Study of India's Unique Identity Project. International Data Privacy Law, 8(4), 329-342. doi:10.1093/idpl/ipy023

Eke, C. H., Alao, S. A., & Omidiora, O. M. (2020). Ethical and Legal Implications of National Identification Programs in Nigeria. Journal of Cybersecurity and Privacy, 1(2), 103-119. doi:10.29012/jcp.v1i2.754

Garcia, M., et al. (2020). "Ethical considerations of artificial intelligence in hiring: Automation or autonomy?" Journal of Business Ethics, 162(2), 395-409.

Gitau, C., Oduor, M., & Masika, M. (2018). The Role of Data Privacy in Mobile Money Adoption in Kenya. International Journal of Engineering Research & Technology, 7(12), 97-106. doi:10.17577/IJERTV7IS12018

Jones, R., et al. (2019). "CRISPR-Cas9 gene editing in human embryos: Perspectives from stakeholders in the UK." Science and Engineering Ethics, 25(3), 805-824.

Kant, I. (1785). "Groundwork of the Metaphysics of Morals."

Kim, J., et al. (2020). "Ethical considerations in synthetic biology research: A systematic review." Science and Engineering Ethics, 26(4), 2263-2285

MacIntyre, A. (1981). "After Virtue: A Study in Moral Theory."

Olaniyan, D. A., & Solomon, A. A. (2017). Biometric Voter Registration and Ethical Challenges in Nigeria: A Case for Balanced Electoral Process. IAFOR Journal of Ethics, Religion & Philosophy, 3(2), 81-98. doi:10.22492/ijerp.3.2.06

Sarathy, P., & Robertson, C. T. (2022). "Artificial Intelligence and the Future of Work: Human Dignity and Ethical Considerations." Business Ethics Quarterly, 32(1), 75-98.

Singer, P. (1972). "Famine, Affluence, and Morality."

Smith, J., et al. (2018). "Facial recognition technology in public spaces: Privacy concerns and perceptions." Computers in Human Behavior, 89, 89-96.

Uwizeyimana, C., & Mutanga, C. (2018). Digital Identity and Human Dignity: Assessing the Impact of the Irembo Initiative in Rwanda. African Journal of Information and Communication Technology, 9(2), 29-46. doi:10.5513/ICTRP.9.2.306

Vijayakumar, S., et al. (2021). "Renewable Energy Technologies and Sustainable Development: Ethical Implications and Policy Considerations." Journal of Business Ethics, 157(3), 611-628.

Zaidi, A. A., Adewumi, A. O., & Botha, A. (2019). Ethical and Legal Issues in the Use of Biometric Data in South Africa. South African Computer Journal, 31(2), 40-63. doi:10.18489/sacj.v31i2.619