

Balancing Technology and Ethics: Exploring Information Technology Ethics and Its Impact on Humanity

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Abstract

In this paper, we seek to answer questions such as: what is Information Ethics? What are the main issues in IT ethics? Is Information Technology (IT) ethics important to humanity? Desktop research was carried out, which involved conducting a comprehensive literature review to gather relevant data and insights regarding information technology ethics. Keywords such as “information technology ethics”, “IT ethics and humanity” were used in searching for relevant literature materials. The findings reveals that IT has brought about various ethical issues, including privacy infringement, issue of accountability on sharing accurate information, issue of ownership rights for proprietary contents, accessibility and its role on enhancing digital divide, security and issue of freedom of expression. These issues raise moral questions about the responsible use of technology and its impact on humans. Furthermore, the research findings highlight the importance of striking a balance between technological advancement and the protection of fundamental human rights. It is crucial to establish robust governance mechanisms and regulatory frameworks to guide the ethical development and deployment of information technology. In conclusion, the research findings demonstrate that IT ethics need to be a matter of concern to humanity and necessitates careful ethical reflection and action. This research paper highlights the importance of acknowledging and addressing ethical challenges of IT to ensure a responsible, inclusive, and sustainable digital future for all.

Keywords: IT Ethics, humanity, privacy, accuracy, property rights, accessibility, security and freedom of expression and speech

1.0 INTRODUCTION

Information technology (IT) has gained significant attention in contemporary society, leading to transformative changes in multiple facets of human existence. From the evolution of computers to the rise of the internet and the proliferation of digital devices, information technology has greatly transformed how individuals communicate, access information, conduct business, and interact with the world. The rapid advancement of IT has brought numerous benefits, enabling increased efficiency, connectivity, and innovation.

As information technology continues to evolve and permeate all facets of human life, it has brought forth a range of ethical challenges. The vast amount of personal data being collected, stored, and analyzed raises concerns about privacy infringement, surveillance, and the potential for misuse[7]. The use of algorithms and artificial intelligence algorithms may result in biased decisions, discrimination, and the erosion of human agency. Additionally, issues such as job displacement, digital divide [13]; [7]; [10]) and cyber threats highlight the need to address the ethical implications of information technology. The focus on IT Ethics has increased in recent years owing to the fact that technology has become ubiquitous and majority of individuals rely on it for both personal and work-related purposes. ([7]).

According to [7], ethics pertains to the moral principles that govern an individual's behavior or the conduct of a particular activity. People's ethical beliefs shape how they interact with others and the world around. Many organizations have a code of conduct in place to build trust and reliability in the way services are delivered. This defines how their employees are expected to adhere to the ethics established by them.

IT ethics therefore, involves the examination of the ethical concerns arising from the use and development of electronic technologies. Its main objective being to identify and address questions related to the moral basis of individual responsibilities and actions as well as the ethical foundations related to public policy [7]. This paper seeks to establish how IT ethics impact mankind and whether it is necessary for the survival of the world. To address the above

main research objective, a desktop research is carried out to address this. This is done through review of various literature on the subject topic.

1.1 Research Objectives

From the above general objective, the below research objectives are derived:

- To examine what is IT ethics
- To examine how IT ethics impact humanity
- To provide any recommendations where any in shaping responsible and sustainable digital future

1.2 Research Questions

- What is IT ethics?
- Is IT ethics important for the survival of humanity?
- What is the way forward in addressing the IT ethics issue?

2.0 METHODOLOGY

The literature review involved an extensive search for scholarly articles, books, reports, and other reputable sources related to information technology ethics. Academic databases such as Google Scholar, ACM Digital Library, Emerald Insight, JSTOR, Scopus and Science Direct were utilized to identify relevant literature. The search terms included combinations of keywords such as "information technology ethics," "ethical implications of information technology," "implications on humanity," and "technology and society."

The search strategy employed a combination of broad and specific search terms to ensure a comprehensive collection of relevant literature. Initially, an exploratory search was conducted to gain a broad understanding of the field. Based on the initial search results, the search terms were refined to focus on specific aspects of information technology ethics, including privacy, security, access, intellectual property rights, digital divide, and ethical frameworks. The search strategy aimed to capture recent and influential publications in the field.

Only peer-reviewed articles, books from reputable publishers, and reports from reputable organizations were considered for inclusion. The sources were evaluated based on their relevance to the research question, the rigor of their methodology, the credibility of the authors and publishers. With the exception of a few classic articles from renowned scholar such as Wiener, Floridi and Mason, the study only considered the most recent of publication (Within 10 years of age). The selected sources covered a diverse range of perspectives and provided a comprehensive understanding of the topic.

3.0 RESULTS FROM LITERATURE REVIEW

3.1 Background of IT Ethics

Wiener made predictions on the present era, foreseeing that society's nature and the relationships of its citizens would be heavily influenced by information and communications. He anticipated that a time will come when machines would collaborate with humans in generating and interpreting messages as well as shaping societal connections. According to Wiener, these machines would possess the ability to learn, gather, collect, store and interpret information which enable reasoning and decision making. He emphasized that the social and ethical implications of these advancements should not be ignored as it will bring ethical dilemmas. We are now witnessing what Wiener referred as the age of automation where the significance of IT aligns with his predictions. Even the social and ethical problems of the Internet is just as per his prediction. [2]

This brings about the question on what is information technology (IT) ethics.[8] defines this as the examination of ethical concerns stemming from the utilization and advancement of electronic technologies. IT ethics traces its roots back to the emergence of computing and digital technologies in the mid-20th century. As these technologies evolved, so did the ethical dilemmas surrounding their use. The field gained prominence in the 1970s and 1980s when issues like data privacy, intellectual property, and computer security became more prevalent ([8]; [3]).

One significant milestone in the history of IT ethics was the establishment of the Association for Computing Machinery (ACM) Code of Ethics and Professional Conduct in 1992. This code laid

out principles and guidelines for computing professionals to uphold ethical standards in their work. In 1998, Helen Nissenbaum's influential work on "Information Technology and the Moral Context" further solidified the concept of IT ethics. Nissenbaum emphasized the importance of considering moral values and social contexts when designing and using information technologies.

Since then, the field has continued to evolve with the rapid advancement of technology. New challenges have arisen, such as artificial intelligence ethics, data mining ethics, and the ethical implications of social media and big data. As technology continues to shape our world, IT ethics remains a crucial area of study, aiming to address the ethical implications of electronic technologies and guide responsible decision-making in this fast-paced digital age [3]. IT ethics thus encompasses computer ethics (CE), media ethics library and bio information ethics [3]. The primary objective of IT ethics is to recognize and address inquiries regarding the ethical foundation of individual responsibilities and behaviors, as well as the ethical principles guiding public policy.

3.2 Philosophy of IT Ethics and its Impact on Humanity

The ethical issues involved in Information Technology (IT) are many and varied. However, for the purpose of this paper we will combine the model of Mason Model of 1986 (PAPA model) and also include partly the issues raised by [12] of Security and Freedom of Expression.

3.2.1. Privacy (P):

The issue of privacy poses such questions as what personal details or information about oneself or one's relationships should be disclosed to others and what safeguards should be put in place? It also addresses what information individuals can keep private without facing any coercion to reveal it. These privacy concerns have become increasingly relevant for citizens to consider in today's world. [6]

These are concerns that individuals must be asking now more than ever. According to [12], IT ethics has given privacy more consideration compared to the other topics. This is a result of the frequent recording, storage and transmission of personal information which exposes that information to third parties and enables them to

access or use this information without the consent of the subject person's agreement thus, infringing on their privacy.

The right to privacy is the ability to manage who has access to one's private affairs including one's body, thoughts, private spaces, private behaviour and personal information about oneself.

[6] informs that there are two factors that put people's privacy at risk. One is the development of IT which has improved capabilities for monitoring, communicating, computing, storing and retrieving data. The second is a more subtle issue on the increased importance of information in making decisions. Policymakers and other stakeholders prize information more and more even when doing so violates someone else's privacy. This becomes troublesome when such private information is intended to be used for making profit [12].

3.2.2. Accuracy (A):

Several dilemma arises when it comes to the information authenticity and accuracy. Also the additional dilemma on who should be held accountable for giving erroneous information. These dilemma were posed by [6].

In today's world, there is production of vast amount of information about individuals and their activities exposes us to significant inaccuracies. This surge in informal also poses another concern on who is to be held accountable for the bad effects over the same and who owns this information? [6]

According to [12], modern society depend heavily on computers for various critical functions such as providing accurate information, facilitating collaboration and social interaction, foraiding in decision-making, and task management. However, the occurrence of computer system malfunctions or errors can result in significant harm, leading to losses in time, finances, property, opportunities, and even human well-being.

The assignment of responsibility for such harms becomes challenging due inherent traits of IT. This problem is commonly referred many- hands' problem which involves debates on whether intelligent computer systems can be held morally accountable for their actions [4]. In light of these situations, an in-depth examination of how responsibility is assigned becomes essential to minimize harm and establish accountability and liability, as discussed by [12].

3.2.3. Property (P):

The other ethical issues as per [6] is Property. In this, such questions as who possesses ownership over information? What constitutes just and fair prices for exchanging information? Regarding channels, particularly airways, through which information is transmitted, who holds ownership? How should access to this limited resource be allocated? These are all intricate questions posed by [6]model.

According to [6], the issue of intellectual property rights is one of the most intricate challenges we encounter as a society. These rights raise significant economic and ethical concerns, revolving around the distinctive attributes of information itself and the methods of its transmission. While producing an individual piece of information can be highly costly initially, once created, it possesses the enigmatic quality of being easily reproducible and shareable with others. Furthermore, this replication doesnot compromise the original, making information difficult to safeguard compared to tangible property. It becomes communicable and challenging to keep it exclusive. On the other hand, receiving proper compensation when others use your information also proves challenging [6].

[12]explain that intellectual property encompasses a wide range of information, ideas, artistic works, and other products of the mind for which the originator holds recognized proprietary rights. To safeguard this Intellectual property, there are laws in place that ensure only the creators benefit from their distribution or availability, whether they are individuals or corporations. Nevertheless, issues related to intellectual property rights for

software and digital information have sparked significant controversies. Some advocate for stringent control by creators over their digital products, while others emphasize the importance of maintaining a robust public domain in cyberspace, advocating for unrestricted access to electronic information, including the ability to copy proprietary software. Computer ethics delve into the ethical and philosophical aspects of these disputes and propose policies to regulate digital intellectual property in its various forms [12].

Another major issue is also the issue of Software Patents, given the intangible nature of software and the challenge of specifying its identity [12].

3.2.4. Accessibility (A):

The last issue on the [6] PAPA model was Accessibility (A). In this, he posed question on what information individuals or organizations can rightfully acquire, and under what circumstances and protections can they do so? [6]

Many scholars e.g [11];[12]; [13]have linked the information revolution toward exacerbating societal inequalities, such as those related to race, class, and gender, leading to the emergence of a digital divide. This divide separates between individuals who possess the necessary skills and opportunities to effectively utilize IT, benefiting from it, from those left behind who are unable to do so.

In the field of computer ethics, researchers study how the design and integration of information technologies into society can contribute to these inequalities. They explore ethical policies that aim to create a more just and equitable distribution of the advantages and disadvantages associated with information technology. It is widely agreed that the more critical the service, the greater the significance of ensuring equity. Consequently, basic services like e-banking, and health services are intentionally designed with inclusivity in mind, accommodating various disabilities [12]

[12] explains the digital divide as the disparity between those who have access to information technology and those who do not. This divide leads to inequalities in education, economic opportunities, and social inclusion. Ethical concerns emphasize the importance of bridging this gap and ensuring equal access to technology and digital resources. Addressing the digital divide necessitates proactive measures to promote digital literacy, affordability, and the implementation of inclusive policies.

3.2.5. Security and Crime (S):

Security and Crime is another IT ethics issue as per [3]. According to [3], the wide spread computer crimes have raised security concerns on computer ethics. Such crimes as IT fraud, the proliferation of computer viruses, computer worms and spam emails, as well as concerns about national security related to the potential terrorist activities utilizing computer networks or targeting them for attacks, have become significant issues in the realm of IT.

Therefore the issue of security in IT ethics aims to safeguard computer systems against unauthorized access, manipulation, data deletion, and denial-of-service attacks. Breaches in computer security can lead to various harms and violations of rights, including economic losses, personal injuries, and privacy and intellectual property rights infringements.

In the present day, there is a heightened emphasis on evaluating the moral and social implications of computer-related crimes and their disruptive behaviors. Additionally, a recent critical security concern involves finding a balance between state interests in monitoring and controlling information for counterterrorism purposes and upholding individuals' rights to privacy and civil liberties. ([9]; [3]).

3.2.6. Free expression and content control

The final IT ethics question is "freedom of expression and content moderation. According to [12], the Internet has emerged as an important platform for exchanging ideas and

information, giving rise to debate about whether governments and service providers should address content control and information censorship on the Internet.

However, such censorship can interfere with the right to freedom of expression, considered a fundamental right in many countries.

The concept of freedom of expression includes both freedom of expression, which allows individuals to express themselves through publication and distribution, and freedom of access to information

Various forms of language have been suggested as potential subjects for censorship. This includes pornography and other explicit content, hate speech by extremist or racist groups, information that may harm or threaten a nation, such as bomb-making instructions, statements that violate privacy or confidentiality, and defamatory content.

Researchers in computer ethics have explored the ethical aspects of various censorship methods, such as legal bans and software filters, and explored the acceptability of these types of speech [12]

4.0 DISCUSSION OF FINDINGS

1. Privacy

As discussed above, the issue of privacy Infringement and Data Protection are one of the prominent ethical concerns in IT. With the increasing collection and processing of vast amounts of personal information, individuals face risks such as unauthorized access, data breaches, surveillance, and the potential misuse of their data. The ethical implications revolve around the need to strike a balance between data-driven innovation and the protection of individual privacy rights.

The issue of Privacy if not addressed leads to more misery than gains. For instance data stored by Telecom companies like Safaricom can be misused in defrauding users and leading to increased Mpesa frauds.

2. Accuracy

Due to the issue of accessibility where many individuals can share information easily, it is important that they take accountability for their actions. Thus the issue of accountability and also ensuring that individuals share accurate information helps prevent sharing of false information across the internet.

3. Property Rights

From the findings above, by having IT ethics protecting property rights, this enables people to be responsible and ensures the right credit is given to the one who deserve it thus protecting people's rights and ideas even in cases where there is no copyright protection. [14]

4. Accessibility and Digital Gap/ Digital Divide

From the findings above, it can be seen as much as IT has brought more benefits such as leading to social inclusion, and innovation among other, it has also brought about more social exclusion, for instance according to [11], there are a fewer women than men in the computing and IT fields today. This leads to discrimination against gender, marginalized communities, etc.

Marginalized communities that do not have access to high-speed internet end-up not benefitting from such resources as free e-learning materials or if it is business limited access to customers; thus leading to inequitable competition.

This is further worsened when the computers actually takes over the jobs of human leading to losses of jobs.[14].

5. Security and Crime

From the findings above, it can be seen there is increased cases of security cases and cybercrimes owing to the vast amount of data stored and recorded in the Internet. Thus, it is important to have ethical guidance for the same so as to minimize these attacks.

6. Freedom of Expression and Justice

The IT ethical issue of Freedom of Expression may have an implication on politics, influencing power and exercise of government control. Thus it is important to safeguard the limit for the freedom of expression so as to prevent cyber warfare. Ethical considerations involve safeguarding democratic processes, protecting freedom of expression, and addressing the potential for digital manipulation and cyber warfare.

Contrary to the above, freedom of expression and accessibility to IT may actually promote justice and freedom in humanity (in [21]). Moreover, [2], believed that human beings are inherently social creatures who can only achieve their fullest potential by actively engaging with a community of like-minded individuals. He referred to this as “The Principle of Minimum Infringement of Freedom”.

7. Creation of Ethical Standards and Guidelines for IT Ethics

From the above impact of IT ethics on humanity, it is important to note the need for creation and maintenance of IT Ethical Standard and Guidelines. This is essential for guiding the responsible and ethical use of information technology. These standards can help inform the development, deployment, and use of technology by providing clear expectations and best practices. Ethical considerations encompass issues such as privacy, security, fairness, accountability, and the responsible handling of data. The establishment of ethical standards and guidelines, informed by interdisciplinary collaboration and stakeholder engagement, promotes consistent ethical decision-making, enhances user trust, and fosters responsible technological development and deployment.

5.0 CONCLUSION

In conclusion, the significance of information technology ethics for humanity is evident in its impact on privacy, accessibility, intellectual property rights, accountability, security and freedom of expression. Striking a balance between technological advancement and ethical considerations is vital for responsible innovation. Governance, regulation, stakeholder responsibility, and collaboration play essential roles in promoting ethical behavior. By embedding ethical principles and values into the development and deployment of information technology, we can create a

digital future that upholds human rights, respects diversity, and serves the best interests of humanity.

References

1. ACM (1992). 1992 ACM Code of Ethics and Professional Conduct; <https://ethics.acm.org/code-of-ethics/previous-versions/1992-acm-code/>
2. Bynum, T.W. (2004). Ethical Challenges to Citizens of 'The Automatic Age':Norbert Wiener on the Information Society. Keynote Address, Ethicomp 2004, Syros, Greece 14th April 2004. Info, Comm & Ethics in Society 2: 65–74
3. Brey, P. and Søraker, J. (2009). 'Philosophy of Computing and Information Technology' Philosophy of Technology and Engineering Sciences. Vol. 14 of the Handbook for Philosophy of Science. (ed. A. Meijers) (gen. ed. D. Gabbay, P. Thagard and J. Woods), Elsevier
4. Floridi, L. (1999). Information Ethics: On the Philosophical Foundation of Computer Ethics. Ethics and Information Technology 1: 37–56, 1999.
5. Gichuki D. K, Rubia S.C and Wabwoba F. (2019). Towards Philosophy of Information Technology, International Journal of Contemporary Applied Researches, 6(6), 35-42. (ISSN: 2308-1365) www.ijcar.net
6. Mason, R. O (1986). Four ethical issues of the information age. MIS quarterly, 10 (1): 5-12
7. Mccann, 2023). Why Ethics Are Important in Information Technology. <https://www.mccann.edu/importance-of-ethics-in-information-technology/>
8. Nissenbaum, H. (1998). Information technology and ethics. The Routledge Encyclopedia of Philosophy. doi:10.4324/9780415249126-L121-1
9. Nissenbaum, H. (2005). Where Computer Security Meets National Security. Ethics and Information Technology, 7, 61-73
10. Njoki, M. M., &Wabwoba, F. (2015). The role of ICT in social inclusion: A review of literature. International Journal of Science and Research (IJSR), 4 (12): 380-387.

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11. Njoki, M.M., Wabwoba, F. & Micheni, E.M. (2016). ICT definition implication on ICT career choice and exclusion among women. *International Journal of Information Technology and Computer Science (IJITCS)* 8(5): 62- 71
 12. Søraker, J. H & Brey, P. (2015). Ethics Assessment in Different Fields Information Technologies. Stakeholders Acting Together on the Ethical Impact Assessment of Research and Innovation - SATORI
 13. Wabwoba, F. & Wechuli, A.N. (2020). ICT for Sustainable Development without Digital Divide in Africa. *International Journal of Computer Trends and Technology*, 68(4): 77-80
 14. Wang, R. (2021). Importance of Computer Ethics and Morality in Society. *Advances in Social Science, Education and Humanities Research*, 631. *Proceedings of the 2021 International Conference on Social Development and Media Communication (SDMC 2021)*