GREEN TECH SKEPTICISM: DOES GENZ QUESTION WHETHER AI, BLOCKCHAIN, OR CLOUD SERVICES CAN TRULY BE SUSTAINABLE?

Rajat Tyagi, DME Law School, Noida[1]

ABSTRACT

This paper seeks to investigate the effect of Artificial Intelligence (AI), Blockchain, and Cloud services upon the environment and examines the sustainability as claimed by various companies engaging in these services. Generation Z (or GenZ) is distinguished from its predecessor generations on grounds of its digital literacy, and greater awareness regarding environment and social concerns. It is for this reason that they are considered as "Digital Natives". As a major consumer segment in the modern world, their expectations regarding transparency, sustainability, and accountability are supposed to influence the market decisions made by companies. To address these expectations, firms position their products as "green" or environment-friendly. These claims, however, can be misleading at times and lead to a practice called "Greenwashing." Greenwashing is the practice of overstating or sometimes even fabricating claims of sustainability without any sufficient evidence to verify the same. Energy demands of blockchain, and data servers for AI systems and cloud services lead to such practices taking ground in even tech industries beyond being originally in traditional industries. Through a systematic literature review and case studies, the paper investigates historical, theoretical and practical aspects of the sustainability of AI, Blockchain and Cloud services. The study highlights not only the tangible aspects such as energy consumption, and electronic waste, but also the legal aspects such as regulations and corporate responsibilities in the digital-electronic sector. The study utilizes a diverse data gathered through a questionnaire from persons part of the generation in question which analyzed the awareness and their opinions and suggestions over such practices by the companies. It is concluded that for there to be trust between the companies and their customers, a more transparent approach should be applied which involves all the stakeholders. An example of such an approach may be dashboards or live systems much like the Air-Quality Index (AQI) which are verifiable and accountable, instead of vague claims and annual reports.

Keywords: Gen Z, cryptocurrency, artificial intelligence, cloud services, sustainability.

---

[1] Law Student at DME Law School, Noida

1. INTRODUCTION

In recent years Artificial Intelligence (AI) and Blockchain have taken a rapid pace in their adoptions into societies while the COVID crisis exemplified the same. These systems have integrated into our lives without us being aware of their existence. AI is integrated in social media algorithms and used for making workflows efficient, while blockchain for creating robust applications in order to ensure security of personal data. Governments all over the globe, including the Indian government are pushing schemes like Blockchain-as-a-Service (or BaaS)[2] to keep up with the rapid pace. This fast-paced growth has dramatically changed how the producers and retailers market their products – moving from traditional methods to personalized and targeted ad-campaigns.[3] This shift also pushed green and environment narrative from traditional industries to the tech industry as well. The tech industry is well-known for its huge consumption of energy specially for data collection and server uptimes. As reported by International Energy Agency (IEA), Global electricity generation to supply data centres is projected to grow from 460 TWh in 2024 to over 1,000 TWh in 2030 and 1,300 TWh in 2035 in the Base Case.[4]

GenZ by virtue of being the earliest digital natives, shape a staggering 43% of the Total consumption spending in India as of 2024, expected to rise to 50% by the year 2035.[5] They are much more aware about market strategies than their previous generations and are able to adopt new ideas much more readily. Honesty, Responsibility and Accountability are expected virtues from service providers beyond just good services. As concluded from the questionnaire, there is a lack of awareness regarding the services discussed under this paper, though they form an essential part of daily life. Cloud services, for instance, are the most common in modern life. From Google drive to working in background when a website loads, all these instances are based on Cloud that has to promise an uptime of 24/7, otherwise all the modern internet services get stalled, as seen during Internet outages due to errors or overload on Amazon Web Servers (AWS) or similar services. It thereby becomes necessary for businesses to adapt to new

---

[2] "Government launches Vishvasya-Blockchain Technology Stack; To offer Blockchain-as-a-Service with a geographically distributed infrastructure," Pib.gov.in, 2024 available at:
https://www.pib.gov.in/PressReleasePage.aspx?PRID=2051934 (last visited October 24, 2025).
[3] Rashmi Arun, "The Impact of Digital Marketing Innovations on Gen Z Consumer Behaviour: An Empirical Study through the Lens of Sustainable Development," 29 Academy of Marketing Studies Journal 1–240 (2025).
[4] IEA (2025), Energy and AI, IEA, Paris https://www.iea.org/reports/energy-and-ai, Licence: CC BY 4.0
[5] Nimisha Jain and Kanika Sanghi et al., "The $2 Trillion Opportunity: How Gen Z is Shaping the New India", Boston Consulting Groups Insights, 2024 available at: https://www.bcg.com/publications/2024/india-the-2-trillion-opportunity-how-gen-z-is-shaping-the-new-india (last visited October 25, 2025)

expectations and raise their standards of accountaibility. This leads to Greenwashing in various instances to increase sales on the grounds of being environmentally sustainable.

Green advertising is an important tool in modern marketing as it triggers the green purchasing intention among the GenZ for it emanates authenticity and credibility.[6] Greenwashing is an obstacle to realizing such transparency. It is the conduct by which producers and service providers misrepresent their products to be environmentally sustainable when the reality is clearly different. United Nations (UN) provides a wider definition on the issue of Greenwashing: "misleading the public to believe that a company or other entity is doing more to protect the environment than it is"[7] The term was coined for the first time by environmentalist Jay Westerveld in 1986 under his essay titled - "The greening of Corporate America". In this essay he criticized the hotels that made customers reuse towels in the name of environment protection, while their actual aim was to save costs.[8] Examples of greenwashing in the Indian context include Patanjali Ayurveda Limited which has been accused of wrongfully marketing their products as "natural" or "herbal". One such test led to suspension of sale of Amla Juice in Army Canteens in 2017.[9]

Academic and industrial research have focused intensively on traditional markets that relate to fast-paced consumer goods or industries that involve greater emissions. However, there exists a lack of research in regards to IT Services and Blockchain that encompass (or will encompass) daily life just like consumer goods as the world moves towards efficiency and automations. There is also a considerable lack of awareness among the GenZ that are known for their proactiveness in new technologies and questioning over sustainability of services provided. This paper aims to analyze such awareness and suggest necessary changes in company policies to address reliability, and sustainability and build trust among the growing consumer base.

2. LITERATURE REVIEW

2.1 Ecological impact of AI, and Cloud services

---

[6] Ahmad Tass, "Driving Environmental Change: The Impact of Social Media on Gen Z's Sustainability Efforts" South Eastern European Journal of Public Health 623–41 (2025).

[7] United Nations, "Greenwashing – the deceptive tactics behind environmental claims | United Nations" United Nations, 2015 available at: https://www.un.org/en/climatechange/science/climate-issues/greenwashing (last visited October 26, 2025).

[8] Bruce Watson, "The troubling evolution of corporate greenwashing" the Guardian (The Guardian, 2016) available at: https://www.theguardian.com/sustainable-business/2016/aug/20/greenwashing-environmentalism-lies-companies (last visited October 26, 2025).

[9] PTI, "Armed forces stores to suspend sale of Patanjali's amla juice" The Hindu, 2017 available at: https://www.thehindu.com/business/armed-forces-stores-suspend-sale-of-patanjalis-amla-juice/article18204512.ece (last visited October 26, 2025).

The accelerating increase in adoption of AI, Cloud Computing and Blockchain is transforming industries and markets worldwide, but history is evident that with each new technology there arises a question on its sustainability - specifically environment and social. AI or Large Language Models (LLMs) require vast data and computational resources, which inevitably increase electricity consumptions, and carbon emissions. As one resident from Port Washington, where a data center is to be expanded for OpenAI's ChatGPT and other AI Services, said on such expansion, "data center[s] will cause increases in energy bills, harm the environment and deplete the local water supply."[10] Water usage is one of the drawbacks of data centers as the computational resources tend to heat up when they are continuously working for an almost perpetual period of time. Although they are better than using traditional methods of air-conditioned rooms to cool down the servers, using local water supply only creates a burden on the local residential population. In a developing nation like India, where the water supply is already scarce in many regions, due to climate change and rapid urbanization, this creates a worrisome situation.[11]

AI and Cloud computing are grounded in the same problems as the basis of both are data centers working perpetually. In India, data centers currently consume less than 1% of the electricity consumption in the country. This is expected to rise at 3% by 2030. In the United States, where 30% of the world's data centers are located, accounted for 1.8% of the country's electricity consumption as of 2018.[12] In 2024, 460TWh of electricity was consumed by data centers, a 1.5% of the global electricity consumption.[13]

2.2 Advent of Blockchain and its ecological impact

When focusing on Blockchain we are concerned primarily with Cryptocurrencies as they are a popular means of implementing a Blockchain infrastructure. First ever cryptocurrency or a decentralized currency was bitcoin, proposed by Satoshi Nakamoto, whose identity remains anonymous to this date. This form of currency requires no intermediaries and is based on the

---

[10] Christina Luick, "OpenAI, Oracle to operate Port Washington data center" Greater Milwaukee Today, 2025 available at: https://www.gmtoday.com/news_graphic/business/openai-oracle-port-washington-data-center/article_694fd51a-3b07-4faf-a5b9-b85c0844ff17.html (last visited October 26, 2025).

[11] Aparna Sivaraman Prabha, Ashwin Ram and Zareena Begum Irfan, "Exploring the relative water scarcity across the Indian million-plus urban agglomerations: An application of the Water Poverty Index," 3 HydroResearch 134–45 (2020).

[12] Md Abu Bakar Siddik, Arman Shehabi and Landon Marston, "The environmental footprint of data centers in the United States," 16 Environmental Research Letters 064017 (2021).

[13] Executive summary – Electricity 2024 – Analysis - IEA, "Executive summary – Electricity 2024 – Analysis - IEA" IEA, 2024 available at: https://www.iea.org/reports/electricity-2024/executive-summary (last visited October 26, 2025).

cryptographic "proof-of-work" model instead of the trust model of traditional fiat and other forms of currencies.[14] Blockchain functions like a decentralized public ledger, in which currency balances, and records of transactions are implemented anonymously. In a bitcoin network, the entire history of transactions is stored in "blocks", linked as a "chain", connected seamlessly by a network of peers. It is by a consensus mechanism, known as Proof-of-Work (PoW) that the newly added blocks are agreed upon by the peers. In this mechanism, peers essentially compete with each other over winning the rights to add the next block in the chain. This process is called "Bitcoin mining". It involves solving a puzzle that requires a considerable amount of computational power. Upon solving the puzzle a "nonce value" is found. An algorithm is applied on this value to map the data to a suggested block, and to a value of fixed length.[15] The output is called "hash" over which the miner gains the right to add a new block when the hash is lower than the target value.[16]

The question then arises on the sustainability of blockchain in the form of cryptocurrencies as mining operations require a lot of computational power, which in turn leads to increase in electricity consumption. Bitcoin by its structure has a maximum supply of 21 million coins and as the cryptocurrency gets closer to its limit, more computer effort is required to mine the remaining coins. More than 90% of bitcoin has been mined by now. The energy consumption for mining cryptocurrency peaked in the year 2022 at estimated 204.5 TWh, which was higher than the energy consumption of Finland in that year. As of 2025, the energy consumption is estimated at 194.83 TWh.[17] This estimated 0.5% of global energy consumption leads to carbon emissions between 39.8–37.6 MtCO$_2$e, a 0.08% of global carbon emissions comparable to carbon emissions from the country of Slovakia.[18]

An article by Jones et al. compared climate damage from bitcoin to other 16 commodities. The climate damage from bitcoin mining was in the same category of energy-intensive productions as gasoline, beef production and electricity-generation using natural gases. Between 2016-2021, average climate damage from bitcoin was 35%, peaking at 82% in the year 2020 – 8.75

---

[14] Satoshi Nakamoto, Bitcoin: A Peer-To-Peer Electronic Cash System bitcoin.org, 2008.

[15] Susanne Köhler and Massimo Pizzol, "Life Cycle Assessment of Bitcoin Mining," 53 Environmental Science & Technology 13598–606 (2019).

[16] Arthur Gervais et al., "On the Security and Performance of Proof of Work Blockchains" Proceedings of the 2016 ACM SIGSAC Conference on Computer and Communications Security 3–16 (2016).

[17] "Bitcoin energy consumption 2025| Statista," Statista, 2025 available at: https://www.statista.com/statistics/881472/worldwide-bitcoin-energy-consumption/ (last visited October 26, 2025).

[18] Alexander Neumueller et al., "Cambridge Digital Mining Industry Report: Global Operations, Sentiment, and Energy Use" (2025).

times greater than climate damage caused by gold mining, leading to cryptocurrency production being digital crude, than digital gold. This estimation included only the energy usage and emissions from mining rigs and not the climate damage incurred from use of cooling systems, and manufacturing of specialized mining rigs. This places the estimation at a lower bound than other commodities whose climate damage was derived from full lifecycle damages. Every $1 of value produced was responsible for $0.35 of climate damages.[19]

2.3 Electronic Waste (E-waste)

Electronic waste (or E-waste) is any "electrical or electronic equipment that is waste, including all components, sub-assemblies and consumables that are part of the equipment at the time the equipment becomes waste (UNEP, 2019)."[20] E-waste is a bio-hazard and in 2022, 62 million tons of e-waste was produced, up by 82% from 2010 and projected to grow at 82 million tons by 2030.[21] As of 2024, "58 thousand kg of mercury and 45 million kg of plastics containing bromi-nated flame retardants are released into the environment every year as a result of non-compliant management of e-waste."[22] Only 20% of this waste is recycled.[23]

Beyond statistical figures, there is a human cost as well. There exist formal systems to recycle the e-waste in developed nations, but the countries find it cheaper to export these wastes to the developing nations of Asia and Africa. Asian countries have a thriving electronics recovery infrastructure but the most of it is informal in nature and therefore beyond the protection of respective laws. This infrastructure then leads to exploitation of women and child laborers who cook circuit boards, burn cables, and submerge equipment in toxic acids to extract precious metals such as copper. The evidence of which has been recorded in China.[24] India is considered the "third largest importer of electronic waste," producing two million tons of e-waste annually and importing an undisclosed amount of it. Around 95% of e-waste is processed by informal industries in India where the workers work under subhuman conditions in regions like

---

[19] Benjamin A Jones, Andrew L Goodkind and Robert P Berrens, "Economic estimation of Bitcoin mining's climate damages demonstrates closer resemblance to digital crude than digital gold," 12 Scientific Reports (2022).
[20] Conference of the Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal Sixteenth meeting, 2023, Appendix 1
[21] "The Global E-waste Monitor 2024" E-Waste Monitor, 2024 available at: https://ewastemonitor.info/the-global-e-waste-monitor-2024/ (last visited October 29, 2025).
[22] Id at p.52
[23] World Economic Forum, A New Circular Vision For Electronics Time For A Global Reboot In Support Of The United Nations E-Waste Coalition Platform For Accelerating The Circular Economy Platform For Accelerating The Circular Economy Platform For Accelerating The Circular Economy, January 2019.
[24] Charles W. Schmidt, "Unfair Trade e-Waste in Africa," 114 Environmental Health Perspectives (2006).

Seelampur.[25]

2.4 Regulatory and legal framework governing Digital technologies

The increasing adoption of Artificial Intelligence (AI), blockchain and cloud computing has raised significant concerns regarding their environmental footprint and the transparency of sustainability claims made by technology companies. As digital infrastructure expands rapidly across the globe, regulatory institutions have started addressing the risks associated with misleading environmental claims (including Greenwashing), as well as the environmental impact of digital technologies. Therefore, legal frameworks that protect consumers, enable environment disclosures and digital governance play a critical role in shaping corporate accountability.

Greenwashing has invited great attention from regulatory authorities more specifically competition regulation bodies because misleading environmental claims distort competitive markets and consumer trust. Delmas and Burbano described Greenwashing as an "act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service."[26] In the context of digital technologies, such practices occur when companies market AI services, cloud infrastructure, or blockchain platforms as environmentally sustainable without providing any verifiable evidence of reduced emissions or responsible resource consumption.

In India, consumer protection law provides an important regulatory framework to address misleading sustainability claims. The Consumer Protection Act, 2019 empowers the Central Consumer Protection Authority (CCPA) to "issue directions and penalties against false or misleading advertisements."[27] The CCPA Guidelines for Prevention and Regulation of Greenwashing (2024) require companies to ensure that their environmental claims are verifiable and certified. For instance, it is necessary for 'specific environmental claims' to be supported by disclosure about "credible certification, reliable scientific evidence, internal verifiable evidence, certificates from statutory or independent third-party verification."[28] Industry self-regulation also plays an important role in controlling misleading environmental claims. The Advertising Standards Council of India (ASCI) has issued guidelines to govern

---

[25] Miles Park, "Electronic waste is recycled in appalling conditions in India" (2019).
[26] Magali A. Delmas and Vanessa Cuerel Burbano, "The Drivers of Greenwashing," 54 California Management Review 64–87 (2011).
[27] The Consumer Protection Act, 2019 (Act 35 of 2019), s. 21
[28] Guidelines for Prevention and Regulation of Greenwashing or Misleading Environmental Claims, 2024 (F.No. CCPA/28/2023), s. 6(5)

environmental advertisements and sustainability claims, requiring that advertisers provide adequate substantiation for claims relating to environmental benefits.[29] Securities and Exchange Board of India (SEBI) has introduced the Business Responsibility and Sustainability Reporting (BRSR) framework, that requires large listed companies to disclose information related to environmental, social, and governance (ESG) performance.[30] Though these guidelines and statutes represent a significant step toward facilitating corporate transparency, they often lack specific indicators addressing the environmental impact of digital infrastructures, like data centers, AI model training, and blockchain mining operations. As a result, the environmental footprint of digital technology remains difficult to assess within conventional frameworks.

Internationally, there have been efforts to bring about specific guidelines for these industries. The European Commission's Ethics Guidelines for Trustworthy AI identifies "sustainable and environmentally friendly AI" as one of the key requirements for AI systems. The guideline ensures "critical examination of the resource usage and energy consumption during training," while the entire system's development, deployment and use process, including the entirety of the supply chain, is assessed in this regard.[31]

Regulatory frameworks often struggle to keep pace with rapid technological developments, and the global nature of digital infrastructure complicates enforcement mechanisms. In these circumstances multilateral agreements with both government and corporate stakeholders can clearly ease the complications, and promote democratization, social empowerment and economic growth through these technologies. One such multilateral forum was the Impact AI summit held in 2026 that concluded with highlighting the aforementioned key takeaways.[32]

2.5 Consumer perception on sustainability and GenZ's role

Early exposure to technologies like computers and mobile phones and growing in an electronic age led to natural inclination of the Generation Z towards advanced technologies like AI, and

---

[29] Advertising Standards Council of India, Guidelines for Environmental Claims in Advertising, 2024.

[30] "SEBI | Business responsibility and sustainability reporting by listed entities," Sebi.gov.in, 2021 available at: https://www.sebi.gov.in/legal/circulars/may-2021/business-responsibility-and-sustainability-reporting-by-listed-entities_50096.html (last visited March 4, 2026).

[31] European Commission: Directorate-General for Communications Networks, Content and Technology & Grupa ekspertów wysokiego szczebla ds. sztucznej inteligencji. (2019). Ethics guidelines for trustworthy AI. Publications Office. https://data.europa.eu/doi/10.2759/346720.

[32] "AI Impact Summit Declaration," 2026 available at: https://impact.indiaai.gov.in/outcome-resources (last visited March 4, 2026).

Blockchains.[33] GenZ values collaboration, and is open to many forms of ideas and innovations, all due to a globalized world focused around the internet that presents itself as a safe harbor of free speech and transparency.[34] Trust is the "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party."[35] The key aspects of trust are therefore vulnerability and risk. A misplaced trust in AI will be a risk to the trustor. The risks involved are misuse of data provided by the user, errors in the machine algorithms, and any other unintended consequences. It becomes necessary to implement transparency, accountability, privacy and a robust governance to inculcate that trust.[36]

In process, five key challenges are identified to building that trust[37] [38] [39]:

1. *Transparency* – To understand how a system works and the processes involved, presented in a human-readable format (through white papers and inbuilt process visualization).

2. *Accuracy and Reliability* – Whether the information provided by a system, especially an AI system, is factual and is not merely an AI hallucination and are there any systems in place to secure the machines and user data against attacks.

3. *Accountability* – Who shall be held accountable in case of any discrepancy or harm caused in the process.

4. *Data Hoarding* – This involves concerns regarding mass data extraction and control over personal data, which may injure the privacy and identity of persons if handled wrongly.

5. *Sustainability* – Whether a system is sustainable in nature, involves both social and environmental impacts of the same. Socially a system must be non-discriminatory, neutral and fair. Environmentally it must adhere to existing environment norms,

---

[33] Martin Zimerman, "Digital natives, searching behavior and the library," 113 New Library World 174–201 (2012).

[34] Anna Dewalska-Opitek et al., "Generation Z's Trust Toward Artificial Intelligence:Attitudes and Opinions," XXVII European Research Studies 33–52 (2024).

[35] Roger C. Mayer, James H. Davis and F. David Schoorman, "An Integrative Model of Organizational Trust," 20 The Academy of Management Review 709 (1995).

[36] Nick Bostrom and Eliezer Yudkowsky, "The Ethics of Artificial Intelligence" Chapman and Hall/CRC eBooks 57–69 (2018).

[37] Anna Dewalska-Opitek et al., supra, XXVII European Research Studies 33–52 (2024).

[38] Alon Jacovi et al., "Formalizing Trust in Artificial Intelligence" Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency 624–35 (2021).

[39] AI, HLEG. "Ethics guidelines for trustworthy AI - Publications Office of the EU" Publications Office of the EU, 2019 available at: https://op.europa.eu/s/Aano (last visited October 31, 2025).

reduced carbon emissions and use of renewable sources of energy.

Green Entrepreneurial Orientation (GEO) has gained the interest of many organizations and also the individuals. GEO is an entrepreneurial mindset that places a great importance on integrating environmental considerations into business strategies, and focusing on creating eco-friendly products and services.[40] By promoting GEO in their business strategy, organizations can reduce their reliance on non-renewable sources of energy and reduce harmful emissions, while providing new and sustainable innovations.[41]

In India and a lot of countries around the globe, cryptocurrencies are considered more of an asset like stocks and mutual insurance, than a medium of exchange.[42] People invest in 'crypto-markets' in order to increase returns and then convert them back to fiat currency in order to exchange for products or services in the market as they are not considered a legal tender. These currencies are often non-transferrable into personal crypto-wallets for storing or securing, thereby compelling investors to use the wallets provided by investing platforms. RBI approaches cryptocurrencies from a skeptical perspective, as they are highly volatile and are often used in illegal trading and practices. Their volatility is due to these currencies being decentralized and backed only by speculation, unlike fiat currencies that are backed by the stability of government and the trust of its people. The degree of inefficiency of a cryptocurrency depends on several factors including the sample time period under investigation, the data, data frequency, and method employed, the cryptocurrency under investigation as well as the maturity, liquidity, and volatility of the market, among others.[43]

A survey in Bangalore, India, concluded that there exists a tech-savvy young adult population in India focused around urban centers. Comfort with new technologies and the internet positions them with adoptions of future technologies much easier. "People with high social media influence tend to be more tech-savvy, distrust traditional finance more, have higher

---

[40] Sourav Mondal, Saumya Singh and Himanshu Gupta, "Exploring the impact of green entrepreneurial orientation on sustainable performance: insights from CSR, policy and innovation," 62 Management Decision 3946–77 (2024).

[41] Farah Ameer and Naveed R. Khan, "Green entrepreneurial orientation and corporate environmental performance: A systematic literature review," 41 European Management Journal 755–78 (2023).

[42] Willy Sandi And Tanty Oktavia, "Analyzing The Influence Of Cryptocurrency On The Switching Intention Of Gen Z And Millennials To Use Cryptocurrency As An Investment Asset," 100 (2022).

[43] Shaen Corbet, Andrew Urquhart and Larisa Yarovaya (eds.), Cryptocurrency and Blockchain Technology (De Gruyter, 2020).

knowledge about crypto, and are more likely to adopt and invest in it."[44]

2.6 Microsoft Mekaguda data center case study

In 2024, Microsoft began building a data center in the village of Mekaguda near the city of Hyderabad, called Microsoft HYD01. This data center is to be used for purposes of Azure cloud and other data services. Three land parcels of 22-acre in Mekaguda, 41-acre in Shadnagar and 52-acre in Chandenvelly were acquired by Microsoft for a total of ₹275 crores.[45]

In July 2023, a petition was filed by a group of 56 local residents against Microsoft and 35 other companies and government bodies in Telangana's High Court, alleging that the company encroached upon lands beyond its property and dumped industrial waste into a nearby Tungakunta lake which is a primary source of water for the local population. The company in response highlighted that it had met all the necessary regulatory requirements and was already in assessment of the impact on the local ecosystem. The village was visited twice and pipelines protruding from Microsoft's boundary wall, which connected to the ground in piles of mud were found. The area was also flattened, cleared of vegetation, and secured with barbed wire fencing.[46] The Telangana government was already constructing a new 220kV grid supply line to meet the needs of the Microsoft data center. Microsoft re-iterated its commitment to use 100% renewable energy for its data center by 2025, and become water-positive to replenish more water than consumed by 2030.

3. RESEARCH METHODOLOGY

The intention of this study was to analyze the awareness and attitudes of Generation Z towards modern digital technologies like Artificial Intelligence (AI), Blockchain or Cryptocurrencies, and Cloud Computing.

RQ1: How familiar are you with the following technologies? (AI, Blockchain, Cloud Computing or Storage).

RQ2: Have you ever personally used or engaged with the following? (AI, Blockchain, Cloud

---

[44] Nidhi Raj Gupta et al., "Building a Crypto Future in Bangalore: A Structural Equation Model of Tech-Savvy, Financial Distrust, Social Media, and Gen Z Adoption" Studies in systems, decision and control 1225–43 (2024).

[45] Faizan Haidar, "Microsoft acquires 3 land parcels in Hyderabad, to establish largest data center region in India" The Economic Times (Economic Times, 2022)available at: (last visited November 3, 2025).

[46] Almaas Masood, "Microsoft is building a data center in a tiny Indian village. Locals allege it's dumping industrial waste" Rest of World, 2024 available at: https://restofworld.org/2024/microsoft-data-center-india-mekaguda-industrial-waste/ (last visited November 1, 2025).

computing or storage)

RQ3: In your opinion, which of these technologies has the highest negative environmental impact? (AI, Blockchain, Cloud computing)

RQ4: When companies claim that their AI, Blockchain, or Cloud computing (or storage) are "green" or "sustainable," how much do you trust these claims?

RQ5: What factors make you most skeptical about the sustainability of these technologies?

RQ6: Would you be more likely to support or use AI, Blockchain, or Cloud resources if they demonstrated clear proof of sustainability (e.g., renewable energy use, transparent carbon reports)?

RQ7: In your opinion, what changes are necessary for AI, Blockchain, and Cloud computing (or storage) to become truly sustainable?

A qualitatively driven mixed-method approach is employed in order to investigate the existing conditions and GenZ attitudes. Mixed-method approach is a research approach in which "a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration."[47] A qualitatively driven mixed-method approach is one where a researcher relies on a qualitative, 'constructivist-poststructuralist-critical' view of the research process, while realizing that quantitative data and analysis will benefit the research projects.[48]

The study has utilized both the qualitative data in form of an extensive literature review and the quantitative data in form of a questionnaire. The intended aim of this research is not to reach conclusions, but explore the environment surrounding new tech developments and greenwashing that has expanded into the Tech industry.[49]

A questionnaire was circulated between 60 persons belonging to the Generation Z within the age group of 14-30, of which 47 valid responses were received. The responses included both male and female, of Indian nationality, attending either high-school or university. The responses were collected from law students, students pursuing computer sciences as masters or

---

[47] R. Burke Johnson, Anthony J. Onwuegbuzie and Lisa A. Turner, "Toward a definition of mixed methods research," 1 Journal of Mixed Methods Research 112–33 (2007).
[48] Ibid.
[49] Robin K. Henson and J. Kyle Roberts, "Use of Exploratory Factor Analysis in Published Research," 66 Educational and Psychological Measurement 393–416 (2006).

already in the field of work. The wider age group and fields of study ensures that the paper reflects opinions from a large generation that includes a sub-generation not so aware about the digital developments and the other much more active and feedback-oriented on the developments.

The sampling method utilized is a mix of convenience and snowball sampling. The researcher first selected a number of colleagues and experts who were then asked to forward the questionnaire into their respective networks. Convenience sampling method allows the researcher to collect responses on an easy-to-access basis and is particularly useful when the researcher lacks extensive resources to conduct research.[50] These responders are categorized as representative samples. These representative samples then share the questionnaire within their network, thereby growing the number of responses, making it a snowball sampling.[51]

| Specification	Options	Sample
Age	13-17	1
	18-24	43
	25-30	3
Gender	Male	28
	Female	18
	Prefer not to say	1
Education level	Highschool	4
	Undergraduate	33
	Postgraduate	10

---

[50] Jawad Golzar, Shagofah Noor and Omid Tajik, "Convenience Sampling," 1 International Journal of Education & Language Studies 72–7 (2022).
[51] Lisa M Given, The Sage Encyclopedia of Qualitative Research Methods 799–800 (SAGE Publications, California, 2008), i, at pp. 799–800.

4. RESEARCH FINDINGS

The sample collected was dominantly between the ages of 18 - 24 (94% of the total sample size). A majority, roughly 51% of the respondents described themselves as "somewhat familiar" with AI, Blockchain, and Cloud computing, while the additional 32% were "very familiar". On the other hand, 13% of the respondents had merely "heard of" these terms and the rest 4% were unfamiliar (Figure 1). Ultimately, almost all respondents (~96%) reported personal experience with AI tools (e.g ChatGPT or Generative AI), whereas engagement with cloud services and blockchain was lower, about 49% and 23% respectively. These figures align with external surveys: for example, a 2025 Walton-GSV-Gallup survey found 79% of Gen Z have used AI tools.[52]

Figure 1: Familiarity With Emerging Technologies
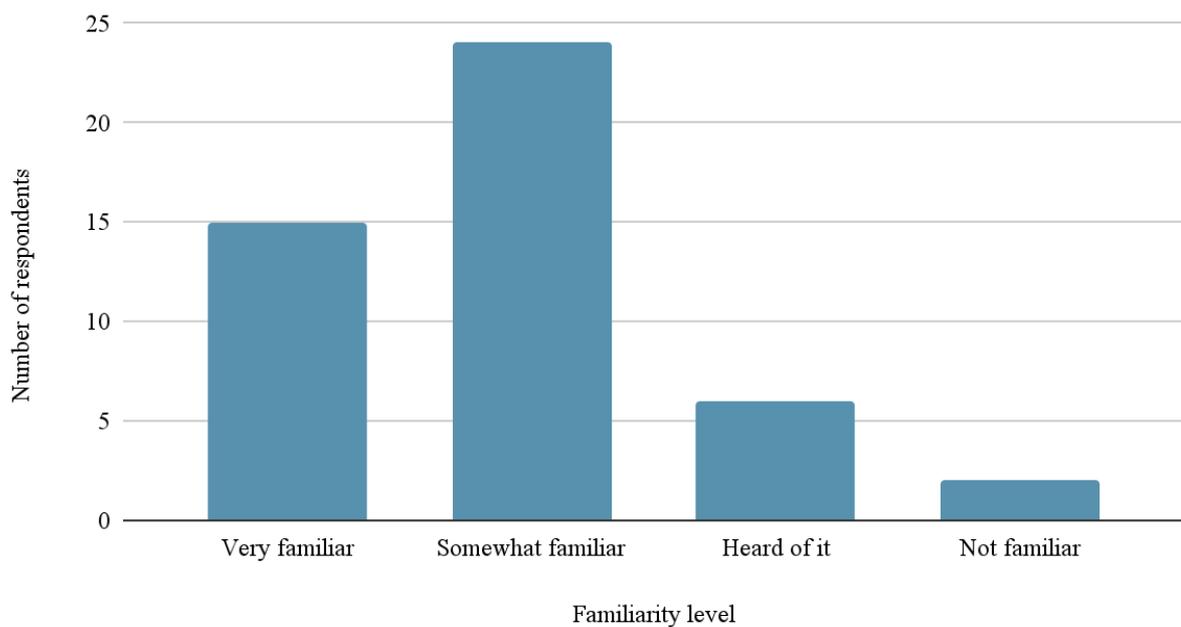
4.1 Perception towards environmental impact

When asked about each technology's environmental effects, most Gen Z respondents gave neutral or mixed responses. Figure 2 represents the responses received on sustainability of AI, Blockchain and Cloud computing. For AI's environment impact, 22 of 47 (48%) chose a neutral (3/5) response, while 10 (22%) rated it slightly negative (2/5) and 13 (28%) rated it positive (4-5/5). Only one person opinionated with the strongly negative response. Similarly,

---

[52] Inc Gallup, "Walton Family Foundation-Gallup Gen Z Research Hub" Gallup.com, 2024 available at: https://www.gallup.com/analytics/651674/gen-z-research.aspx (last visited February 27, 2026).

the majority were unsure about blockchain's sustainability: 30 of 47 (64%) answered "not sure," with only 10 (21%) expressing any confidence ("likely" or "definitely" sustainable) and 7 (15%) saying "likely not" or "definitely not". Cloud computing showed a more favourable opinion from respondents: 20 of 47 (43%) said it was "likely" or "definitely" sustainable, 9 (19%) said "likely not"/"definitely not," and the rest (38%) were unsure. All of these responses indicate an ambivalence on the part of Gen Z, as they neither clearly endorse nor reject the green credentials of AI, blockchain or cloud. This may be in part due to lack of awareness and/or verifiable metrics available in the public domain.

Figure 2: Perceived sustainability
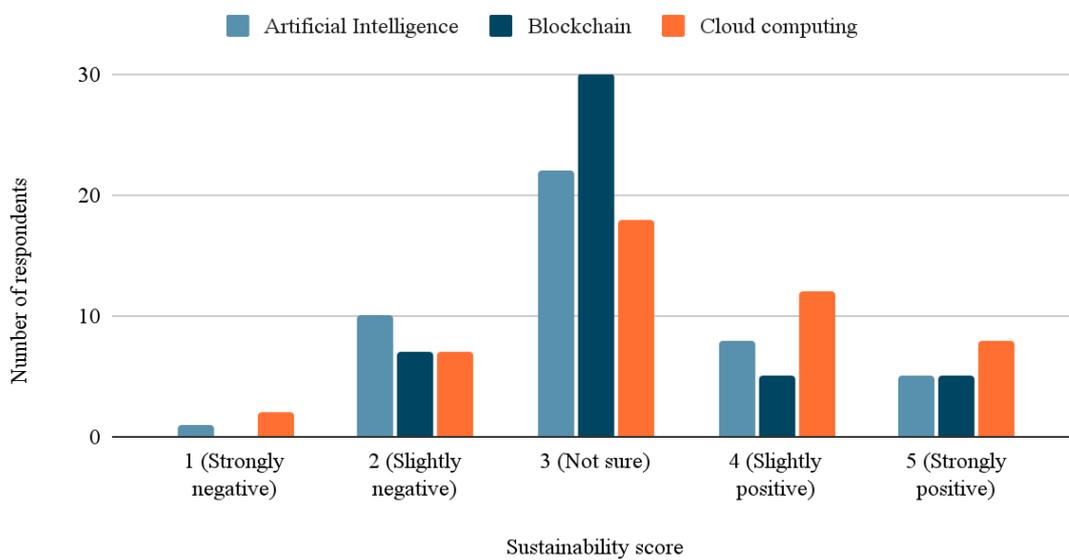
When asked what technology has the highest negative impact, 17 of 47 (36%) singled out AI as the primary culprit; a nearly equal share, 16 of 47 (34%) chose "All equally". While 7 of 47 would choose "none" as the option, far fewer would single out blockchain (4 of 47, 9%) or cloud (3 of 47, 6%) as the primary culprit (Figure A3). In other words, AI was seen as the leading culprit, but many of the respondents viewed the environmental burden as broadly shared, while some considerable enough believed that none of the technologies have a very negative impact. The concern is grounded in reality: analysts have warned that data center energy demand (driven by developments in AI and cloud) are forecasted to surge - IEA projected data center electricity usage to nearly double by 2030 (to about 945TWh, ~3% of global power).[53] Upon that, the amount of water consumed for cooling-down continuously

---

[53] IEA, "Energy demand from AI – Energy and AI – Analysis - IEA" IEA, 2025 available at: https://www.iea.org/reports/energy-and-ai/energy-demand-from-ai.

running systems may lead to shortage of water in residential areas. Likewise, blockchain (notably Bitcoin) has been shown to incur climate damages comparable to major fossil-fuel uses (similar to consumption of gasoline), often termed as "digital crude."[54]

Figure 3: Technology perceived as most environmentally harmful
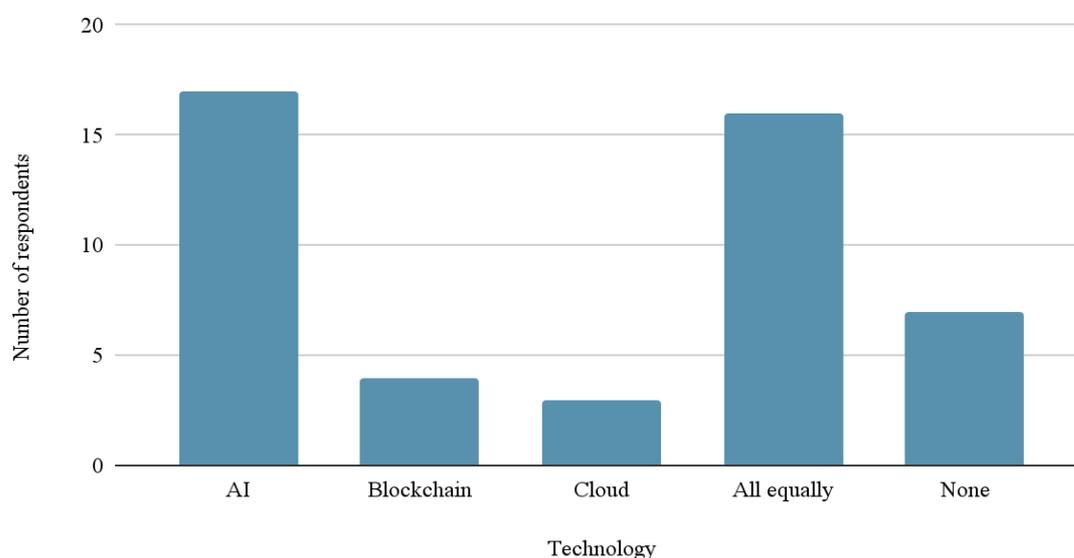
4.2 Trust in sustainability claims

Respondents showed broad skepticism towards "green" marketing. When companies label AI, blockchain, or cloud as "green" or "sustainable," trust was generally low: 27 of 47 (57%) gave a neutral or mid-point response, 12 (26%) gave low-trust ratings (1-2 on a 5 point scale), and only 6 (13%) gave a high-trust (4-5 on a 5 point scale) (Figure 4). To sum it all, roughly one third of the respondents were tepid or showed doubt about corporate sustainability claims. In addition, when asked whether "greenwashing" is common in tech industries, 43 of 47 (91%) said that it is common or very common in tech industries (28 - "somewhat common"; 15 - "very common"), with only 4 (9%) saying it is "rare" or non-existent (Figure 5). This finding aligns with the earlier findings in a 2024 survey by Capgemini Research Institute (CRI), where it was discovered that more than three quarters of Gen Z aging between the age of 18 and 24 showed a distrust towards the corporate sustainability initiatives.[55]

---

[54] Benjamin A. Jones, Andrew L. Goodkind and Robert P. Berrens, "Economic estimation of Bitcoin mining's climate damages demonstrates closer resemblance to digital crude than digital gold," 12 Scientific Reports (2022).

[55] Joe Lepper, "Half the public think companies are 'greenwashing their sustainability initiatives'" Better Society, 2024 available at: https://www.bettersociety.net/Half-the-public-think-companies-are-greenwashing-their-sustainability-initiatives.php (last visited February 28, 2026).

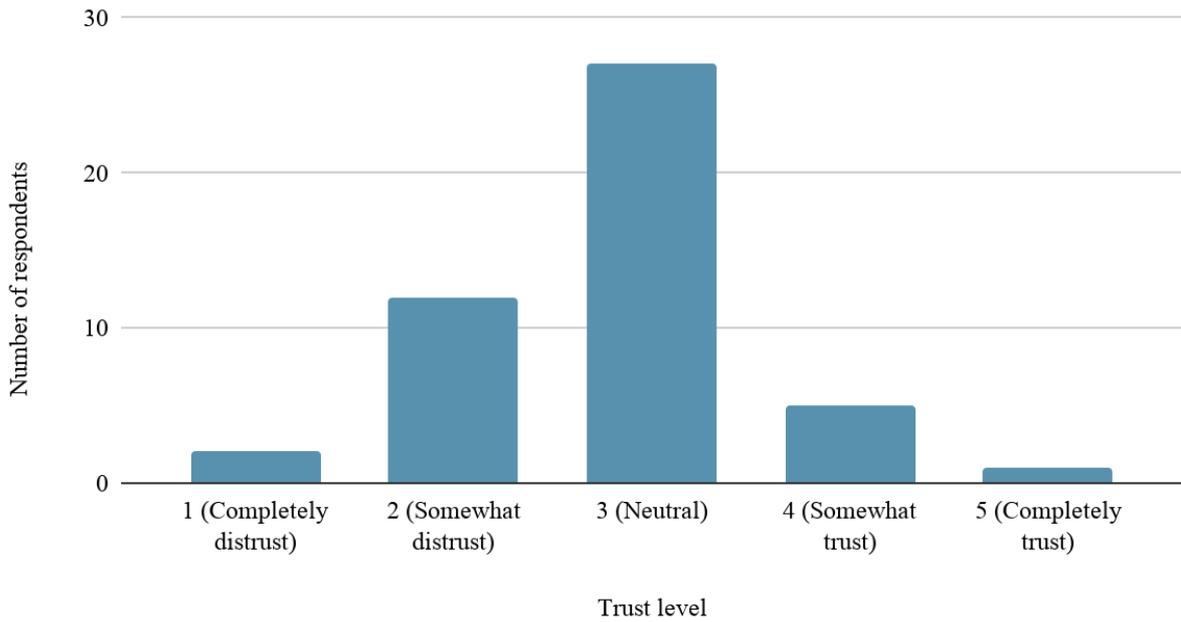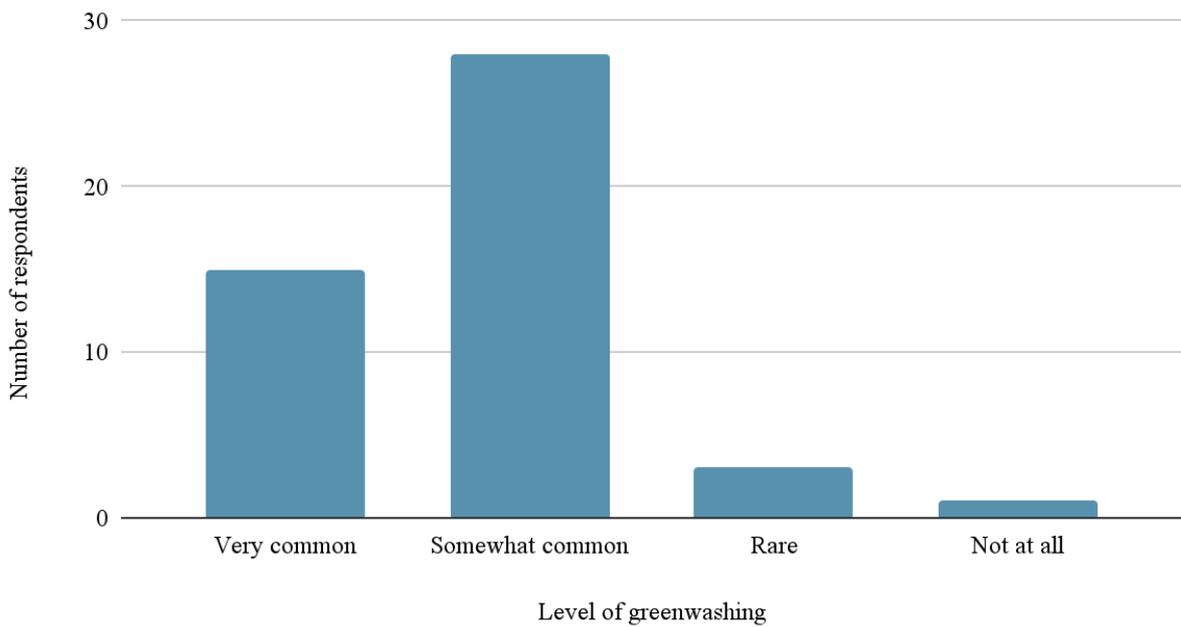## Figure 4: Trust in corporate sustainability claims

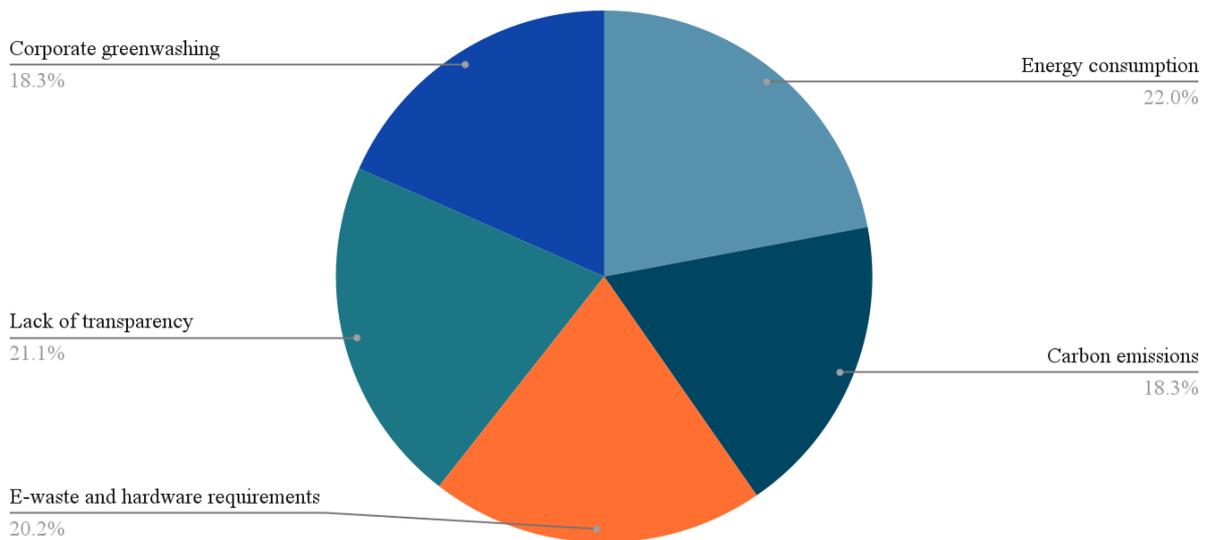## Figure 5: Perception of greenwashing in Tech industry

4.3 Factors leading to growing skepticism over sustainability of AI, Blockchain and Cloud

When asked what factors drive their skepticism, Gen Z often cited energy consumption (24 of 47, 51%) and lack of transparency (23 of 47, 49%) as the primary reasons. Followed by "E-waste and hardware requirements" (22 of 47, 47%), while "Corporate greenwashing" and

"Carbon emissions" each chosen by 20 of 47 (43%) respondents (Figure 6). In short, the top worries of the respondents were power consumption of data centers, e-wastes and "actual" damages to the environment hidden from the consumers. These concerns are validated by various reports from IEA, and United Nation's Global E-waste Monitor (GEM): global e-waste is growing rapidly by 2.6 million tonnes annually (projected ~82 million tonnes by 2030) as older hardware becomes obsolete at the creation of new. Electricity usage at data centers are forecasted to expand by ~15% per year, as discussed earlier.[56] [57]

Figure 6: Factors responsible for skepticism

Corporate greenwashing
18.3%

Energy consumption
22.0%

Lack of transparency
21.1%

Carbon emissions
18.3%

E-waste and hardware requirements
20.2%

4.4 Proof and recommended changes for Sustainability

Most respondents agree that they would respond positively if tech makers provided clear evidence of sustainability. When asked if they would be likely to use AI, blockchain, or cloud services that are able to demonstrate measurable environmental benefits (e.g. renewable power, carbon reporting), 30 of 47 (64%) answered "Yes", 11 (23%) answered "Maybe", and only 6 (13%) answered "No". Similarly, a strong majority believe that their generation will push for sustainable tech: 35 of 47 (74%) respondents said "Yes", while 7 chose "Maybe", and the rest 5 of 47 responded with "No". This suggests Gen Z feels empowered to influence tech companies and their policies.

---

[56] "The Global E-waste Monitor 2024" E-Waste Monitor, 2024 available at: https://ewastemonitor.info/the-global-e-waste-monitor-2024 (last visited February 28, 2026).
[57] IEA, "Energy demand from AI – Energy and AI – Analysis - IEA" IEA, 2025 available at: https://www.iea.org/reports/energy-and-ai/energy-demand-from-ai.

Open-ended answers on what changes are needed were dominated by calls for renewables, efficiency and transparency. One respondent suggested a technical approach of cloud providers utilizing low-PUE (Power Unit Efficiency) data centers with "smart workload scheduling", while prioritizing "hardware reuse and optimized algorithms to cut energy costs." Another urged "better use of sustainable sources of energy like solar and better water management like closed loop circulation", during cooling-down of computer systems to prevent unnecessary water-loss and threatening conditions to vulnerable parts of the world where water already exists in scarcity. Another respondent showed a pessimism on part of industry itself - "Perhaps such an industry can never directly be termed as 'sustainable' purely due to the iterative nature of it. For example the current AI accelerator cards in AI datacentres will inevitably be replaced in 3 to 5 years as further advancements in silicon lithography are made." The respondent reiterates that there is only a limit to which old hardware can be recycled, portraying the need of "approaching sustainability by instead trying to offset the unavoidable [emissions] by investments in preexisting sustainability projects."

5. CONCLUSION

The rapid expansion of Artificial Intelligence (AI), Blockchain and Cloud services has significantly transformed digital infrastructure, and economic activity across the globe. While these technologies promote efficiency, automation, and innovation, their resource consumption has attracted questions about their sustainability and environmental impact. The present study sought to examine the awareness and perceptions of Generation Z regarding the sustainability of these technologies and the credibility of sustainability claims made by technology companies.

The survey findings revealed that the Gen Z respondents are tech-savvy early adopters of modern technologies such as AI, and cloud services, based on their familiarity and usage of these technologies, yet they simultaneously express concern against the carbon footprints left behind by these systems. At the same time, there is a strong belief that these systems could be made more sustainable, and that companies are responsible for the same. The survey also highlights a broader concern regarding credibility of environmental claims made by technology companies. A majority of respondents indicated that they believe greenwashing practices are common within the technology industry. This leads to reduced trust score, aligning with academic literatures suggesting that misleading environmental communication can undermine

consumer trust and distort market behaviour.[58] A substantial proportion of respondents indicated that they would be more likely to support or use digital technologies if companies could demonstrate clear and verifiable evidence of sustainable practices. These findings reinforce the argument that transparency, accountability, and verifiability of environmental metrics are central to building trust between technology providers and consumers.

International regulatory developments also demonstrate growing recognition of sustainability challenges in digital technologies. The European Union's proposed Green Claims Directive seeks to prevent companies from making vague or misleading environmental claims by requiring standardized verification of sustainability assertions. Likewise, global governance initiatives such as the European Commission's Ethics Guidelines for Trustworthy AI emphasize the importance of sustainability and environmental responsibility in the development and deployment of AI systems.

In light of the findings of the study, and opinions of the respondents, following recommendations may be proposed for both the policymakers and technology companies in order to improve transparency and accountability: First, the companies developing and operating these systems must ensure transparency by including a publicly accessible sustainability dashboard that provides real-time data regarding energy consumption, carbon emissions, and resource utilization. This can function similarly to the public environmental indicators such as Air Quality Index (AQI) systems. Second, policymakers should consider developing specific regulatory frameworks addressing digital technologies. Third, environmental reporting systems such as ESG and BRSR could be expanded to include indicators relating to energy efficiency, renewable energy usage, and electronic waste management that is associated with computer hardware. Fourthly, technological innovation itself should be directed toward improving efficiency of digital systems. For example, by adopting closed-loop water circulation systems, and renewable energy sources. A critical technological shift is also needed at the circuit level, since the prevalent binary circuit is limited by its "huge number of connections, which necessitates a large chip surface and a significant rise in energy consumption."[59] A shift toward ternary or trit (base three) computing can allow higher efficiency at low energy consumption because utilizing a trit-based system can allow more information to be stored within a digit. Finally, collaboration between governments,

---

[58] Supra note 26.
[59] Erfan Abbasian, Maedeh Orouji and Sana Taghipour Anvari, "An efficient GNRFET-based circuit design of ternary half-adder," 170 AEU - International Journal of Electronics and Communications 154808 (2023).

technology companies, academic researchers, and civil society organizations will be essential in addressing these challenges associated with emerging technologies.

BIBLIOGRAPHY

1. Rashmi Arun, "The Impact of Digital Marketing Innovations on Gen Z Consumer Behaviour: An Empirical Study through the Lens of Sustainable Development," 29 Academy of Marketing Studies Journal 1–240 (2025).

2. IEA (2025), Energy and AI, IEA, Paris https://www.iea.org/reports/energy-and-ai, Licence: CC BY 4.0

3. Ahmad Tass, "Driving Environmental Change: The Impact of Social Media on Gen Z's Sustainability Efforts" South Eastern European Journal of Public Health 623–41 (2025).

4. Md Abu Bakar Siddik, Arman Shehabi and Landon Marston, "The environmental footprint of data centers in the United States," 16 Environmental Research Letters 064017 (2021).

5. Susanne Köhler and Massimo Pizzol, "Life Cycle Assessment of Bitcoin Mining," 53 Environmental Science & Technology 13598–606 (2019).

6. Benjamin A Jones, Andrew L Goodkind and Robert P Berrens, "Economic estimation of Bitcoin mining's climate damages demonstrates closer resemblance to digital crude than digital gold," 12 Scientific Reports (2022).

7. "The Global E-waste Monitor 2024" E-Waste Monitor, 2024 available at: https://ewastemonitor.info/the-global-e-waste-monitor-2024/ (last visited October 29, 2025).

8. Magali A. Delmas and Vanessa Cuerel Burbano, "The Drivers of Greenwashing," 54 California Management Review 64–87 (2011).

9. Martin Zimerman, "Digital natives, searching behavior and the library," 113 New Library World 174–201 (2012).

10. Anna Dewalska-Opitek et al., "Generation Z's Trust Toward Artificial Intelligence:Attitudes and Opinions," XXVII European Research Studies 33–52 (2024).

11. Roger C. Mayer, James H. Davis and F. David Schoorman, "An Integrative Model of Organizational Trust," 20 The Academy of Management Review 709 (1995).

12. Nick Bostrom and Eliezer Yudkowsky, "The Ethics of Artificial Intelligence" Chapman and Hall/CRC eBooks 57–69 (2018).

13. Alon Jacovi et al., "Formalizing Trust in Artificial Intelligence" Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency 624–35 (2021).

14. Sourav Mondal, Saumya Singh and Himanshu Gupta, "Exploring the impact of green entrepreneurial orientation on sustainable performance: insights from CSR, policy and innovation," 62 Management Decision 3946–77 (2024).

15. Farah Ameer and Naveed R. Khan, "Green entrepreneurial orientation and corporate environmental performance: A systematic literature review," 41 European Management Journal 755–78 (2023).

16. Willy Sandi And Tanty Oktavia, "Analyzing The Influence Of Cryptocurrency On The Switching Intention Of Gen Z And Millennials To Use Cryptocurrency As An Investment Asset," 100 (2022).

17. Faizan Haidar, "Microsoft acquires 3 land parcels in Hyderabad, to establish largest data center region in India" The Economic Times (Economic Times, 2022) available at: https://economictimes.indiatimes.com/industry/services/property-/-cstruction/microsoft-acquires-3-land-parcels-in-hyd-to-establish-largest-datacenter-region-in-india/articleshow/90048427.cms

18. Almaas Masood, "Microsoft is building a data center in a tiny Indian village. Locals allege its dumping industrial waste" Rest of World, 2024 available at: https://restofworld.org/2024/microsoft-data-center-india-mekaguda-industrial-waste/

19. R. Burke Johnson, Anthony J. Onwuegbuzie and Lisa A. Turner, "Toward a definition of mixed methods research," 1 Journal of Mixed Methods Research 112–33 (2007).

20. Lisa M Given, The Sage Encyclopedia of Qualitative Research Methods 799–800 (SAGE Publications, California, 2008)

21. Joe Lepper, "Half the public think companies are 'greenwashing their sustainability initiatives'" Better Society, 2024 available at: https://www.bettersociety.net/Half-the-public-think-companies-are-greenwashing-their-sustainability-initiatives.php