

From Participation to Exposure: NFTs and the Socio-Environmental Tensions of Digital Innovation

Marc Oberhauser

Department of Management
ESCP Business School
Madrid, Spain
Email: moberhauser@escp.eu

Vitor Lima

Department of Marketing
ESCP Business School
Paris, France
Email: vlima@escp.eu

Petros Chamakiotis

Department of Management
ESCP Business School
Madrid, Spain
Email: pchamakiotis@escp.eu

Abstract

Digital innovation is typically discussed in terms of inclusion, efficiency, and value creation. Non-fungible tokens (NFTs) reveal a less visible dimension of digital innovation: their benefits can accrue to a relatively small number of actors, while their environmental and social costs extend beyond those who participate in, or benefit from, the technology. Using NFTs as a revealing case, we examine the tension between digital value creation and socio-environmental cost externalisation. Drawing on the Anthropocene and, in particular, the Capitalocene as a productive interpretive lens, we examine how digital artifacts, often perceived as intangible, are embedded in economic, infrastructural, and institutional arrangements through which benefits, responsibilities, and socio-environmental consequences are unevenly distributed. We argue that this tension adds an important dimension to digital inequality because participation and exposure need not coincide. We therefore call on Information Systems scholars to examine not only who accesses, participates in, and captures value from digital innovation, but also who bears responsibility and who is exposed to its (unintended) consequences. We outline avenues for doing so through multidimensional approaches to digital inequality, climate justice, socio-environmental externalities, and critical futures thinking.

Keywords: Anthropocene, Capitalocene, Digital divide, Non-fungible tokens (NFTs), Socio-environmental externalities, Tensions.

1 Introduction

Digital innovation is often celebrated for expanding access, enabling inclusion, and generating new forms of value. Yet emerging digital technologies also reveal a less comfortable reality, namely that benefits may be concentrated among relatively few actors,

while environmental and social costs are widely distributed. This paper offers a provocation for the Information Systems (IS) discipline that our dominant conceptual tools remain inadequately equipped to account for this asymmetry. IS research has recognised wider social and ethical implications of technologies, including socio-environmental impacts (Seidel et al., 2017). There is a growing interest in digital technologies' social (Chamakiotis & Petrakaki, 2025; Pang et al., 2024; Spiekermann et al., 2022) and environmental value (Babel et al., 2022; Davison et al., 2023; Gholami et al., 2016). At the same time, research has increasingly highlighted the 'dark side' of digital technologies, often arguing that digital innovations—if approached without social consciousness—may generate unintended negative consequences, often faced by the most vulnerable in society (Benbya et al., 2025; Spiekermann et al., 2022; Tavares et al., 2023). One prominent concept in this debate is the 'digital divide' (Heeks, 2022; van Dijk, 2020).

Research on the digital divide has evolved considerably beyond questions of physical access to examine differences in skills, use, participation, and the conditions under which digital inclusion may itself produce disadvantage (Heeks, 2022; van Dijk, 2020; Vassilakopoulou & Hustad, 2023). Our provocation builds on these developments but shifts attention to a different relationship between digital technologies and inequality. Existing perspectives remain primarily concerned with people's relationships to digital technologies as users, potential users, or participants. Contemporary digital artifacts, such as cryptocurrencies and non-fungible tokens (NFTs), bring an additional dimension into view. Their consequences can extend beyond those who access or use them, meaning that individuals may be exposed to the social and environmental costs of digital innovation without participating in, or benefiting from, the technologies and markets that generate them.

NFTs are a revealing case; they record the ownership and transfer of distinguishable tokens on a blockchain, and their proponents emphasise security, transparency, traceability, and efficiency, alongside new opportunities for value creation (Lee et al., 2024). Some authors have demonstrated NFT-based carbon emission tracing in the energy sector through a proof of concept (Babel et al., 2022), although this does not establish widespread deployment or net environmental benefits. NFTs have attracted particular attention in digital art, collectibles, and speculative investment markets (Chalmers et al., 2022), and they depend on blockchain infrastructures whose socio-environmental costs vary across chains and may extend to populations far removed from the markets themselves (Taffel, 2023). This asymmetry is central to our argument: The actors who participate in and capture value through NFT markets need not be the same actors who are exposed to their wider socio-environmental consequences.

To make sense of this, we draw on the concepts of the Anthropocene and the Capitalocene from debates on environmental change. While the Anthropocene emphasises humanity's collective role in driving planetary change, the Capitalocene foregrounds the systemic role of capitalist accumulation, unequal responsibility, and uneven exposure to harm. Following calls for multidisciplinary research to study contemporary IS phenomena (Tarafdar & Davison, 2018; Vassilakopoulou & Hustad, 2023), we use this distinction to investigate the socio-environmental implications of NFTs and to extend analyses of digital inequality by considering exposure alongside access and participation.

Our provocation centres on a tension between digital value creation and socio-environmental cost externalisation. Following Richter et al. (2026), we examine how the pursuit of opportunities for participation and value creation interacts with the responsibility to account for costs borne beyond those who benefit. Digital innovations can generate legitimate opportunities for participation, ownership, and value creation while the socio-technical arrangements enabling those opportunities may simultaneously distribute environmental and social costs beyond the actors who directly participate in, or benefit from, them. NFTs provide a revealing case of this tension because the actors capturing value through digital markets and those exposed to their wider socio-environmental consequences need not be the same. Alongside asking who has access, who participates, and who benefits, we argue that IS research should also ask who bears the costs of digital innovation, through which socio-technical arrangements, and with what consequences.

In the sections that follow, we first discuss the case of NFTs and the technological characteristics that make them an important contemporary example. We then apply the Capitalocene lens to show why NFTs should not be understood merely as a digital innovation, but as socio-technical artifacts embedded in broader systems of accumulation, environmental extraction, and uneven harm. We conclude our provocation by outlining avenues for IS research, including multidimensional inequality frameworks, climate justice perspectives, and critical futures thinking.

2 NFTs as a case of externalised digital innovation

NFTs are unique digital tokens recorded on a blockchain that tracks their ownership and transfer (Entriken et al., 2018). They can be associated with a wide range of digital objects, including artworks, music, in-game assets, and online content (Regner et al., 2019), although token ownership does not by itself establish authenticity or confer copyright in the associated content (USPTO & US Copyright Office, 2024). In March 2021, a digital artwork titled *Everydays: The First 5000 Days* was sold as an NFT for \$69 million. This highly publicised transaction brought widespread attention to the creation of scarce, tradable tokens associated with reproducible digital content. Often framed as an innovative breakthrough, NFTs promise increased transparency, traceability, and efficiency in digital transactions (Lee et al., 2024). They are also associated with new opportunities for creators to monetise digital content and retain control over its distribution, for instance, through embedded royalty mechanisms in smart contracts (Chalmers et al., 2022). Smart contracts can specify resale royalties, although payment depends on marketplace arrangements and is not universally enforced by token standards (Burks et al., 2020). These features have led to claims that NFTs may democratise access to digital markets and empower creators.

However, such narratives capture only part of the picture. Research has highlighted speculative investment in digital collectibles (Chalmers et al., 2022) and concentrated trading activity in early NFT markets (Nadini et al., 2021). NFTs create distinguishable tokens that can be traded even though the associated digital content may remain reproducible (Entriken et al., 2018). This transformation of digital abundance into scarcity underpins the emergence of new digital marketplaces in which value is generated through trading, speculation, and the commodification of digital artifacts (Beinke et al., 2023).

As NFTs are often encountered as intangible artifacts, their physical and infrastructural conditions can be obscured (Kinsley, 2014). NFTs are nevertheless embedded in blockchain infrastructures whose environmental impacts depend on the underlying consensus mechanism and chain¹. Ethereum, a blockchain supporting many NFT applications, transitioned from proof-of-work to proof-of-stake in September 2022, substantially reducing its energy consumption (Ethereum Foundation, n.d.). This transition underscores a central point of our argument by showing that the socio-environmental consequences of NFTs cannot be inferred from the digital artifact alone but depend on the infrastructure through which they operate.

The consequences of such infrastructures can extend beyond their direct users. Guidi et al. (2025), for example, traced electricity demand from 34 US Bitcoin mines to additional generation at power plants and modelled the resulting fine-particle pollution affecting communities, often far from the mines. These findings concern Bitcoin mining infrastructure; they neither isolate NFT-related activity nor establish whether exposed residents participate in cryptocurrency markets. Nevertheless, they illustrate how the operation of digital infrastructure can produce environmental consequences beyond the organisations directly consuming the associated resources. We use cost externalisation to refer to environmental and social burdens borne by third parties that are not fully reflected in the costs paid by the actors generating them. Electricity expenditure itself is therefore distinct from the pollution-related harm that may be externalised.

In this sense, NFTs provide an entry point for examining a broader tension in contemporary digital innovation. Digital markets can create opportunities for value generation while depending on infrastructures whose costs extend beyond market participants. Whether and how this occurs depends on the technological, economic, and institutional arrangements involved. Consequently, NFTs are a theoretically informative case, rather than a representative sample of digital innovation. They allow us to examine how benefits, responsibilities, and exposure are distributed, without assuming that all applications share the same environmental profile or that non-users invariably bear the greatest ensuing harm.

3 From Anthropocene to Capitalocene: Situating digital markets

Contemporary debates on environmental degradation are often framed through the concept of the Anthropocene, which attributes planetary change to the cumulative impact of human activity (Crutzen & Stoermer, 2000; Steffen et al., 2015). This perspective highlights the scale at which humanity has transformed Earth systems, including climate change, biodiversity loss, and resource depletion (Richardson et al., 2023). However, while analytically powerful, the Anthropocene has been criticised for treating humanity as a homogeneous actor and obscuring the uneven distribution of responsibility for environmental harm (Taffel, 2023).

¹ A consensus mechanism is the process through which participants in a blockchain network agree on and validate transactions. Consensus mechanisms differ substantially in their computational requirements and therefore in their energy consumption; proof-of-work generally requires considerably more computational activity than proof-of-stake.

Empirical evidence suggests that environmental impact is far from evenly distributed. The 10% of most polluting people worldwide are responsible for almost 50% of the annual greenhouse gas emissions (UNDP, 2023). These inequalities become even more pronounced when considering the wealthiest segments of the global population. In their 2020 inequality report, Oxfam, in collaboration with the Stockholm Environment Institute, showed that the richest 1% (around 63 million people) accounted for 15% of cumulative emissions, more than double the share of the poorest half (Gore et al., 2020). A follow-up report estimated that the investment emissions of 125 of the world's richest billionaires averaged more than one million times the emissions of someone in the bottom 90% of humanity (Maitland et al., 2022). Thus, while humanity is a major geological force of the current epoch, as the Anthropocene suggests, responsibility for this impact is highly uneven. As Taffel (2023, p. 436) formulates, "climate change is predominantly an issue that results from the activities of a relatively small subset of economically privileged humans acting within the context of a capitalist socio-economic system".

In response to these critiques, the notion of the 'Capitalocene' has been suggested as an alternative framing (Malm & Hornborg, 2014; Moore, 2016). We use the Capitalocene not as a definitive explanation of ecological crisis, but as a productive interpretive lens. The nomenclature of the Capitalocene emphasises that ecological crises are systemic to our capitalist socio-economic system, including its modes of production, accumulation, and consumption, rather than blaming humanity as a whole. Similar inequalities are observed in who bears the negative consequences of climate change and related ecological crises. The Intergovernmental Panel on Climate Change (IPCC, 2023) concludes that vulnerable communities with low historical contributions to climate change experience disproportionate adverse impacts. This provides a broader context for examining unequal exposure, rather than evidence of the distribution of harms attributable to NFTs. From this perspective, environmental harm is not simply the outcome of human activity but the result of historically specific socio-economic systems that prioritise growth, commodification, and profit maximisation.

Applying this lens to digital technologies shifts the analytical focus in important ways. Rather than viewing technologies such as NFTs as neutral tools with unintended negative side effects (Benbya et al., 2025), the Capitalocene perspective highlights how they are embedded in, and reinforce, broader systems of value creation and extraction. NFTs exemplify how digital artifacts are integrated into speculative markets that extend capitalist logics into new domains, transforming intangible digital objects into tradable commodities and enabling new forms of accumulation. Viewed in this way, the socio-environmental consequences identified in the previous section cannot be separated analytically from the arrangements through which digital value is created. NFT markets depend on particular combinations of token design, blockchain infrastructures, energy systems, and market incentives. These arrangements provide a link between the political economy of digital value creation and infrastructural processes such as those traced by Guidi et al. (2025). Whether the resulting exposure also follows broader patterns of climate vulnerability (IPCC, 2023) remains an empirical question.

Understanding NFTs through the lens of the Capitalocene thus reveals them not as isolated technological phenomena, but as manifestations of a broader socio-technical system that

links digital innovation to processes of accumulation, inequality, and ecological degradation. This shift in perspective is critical for IS research. It suggests that the socio-environmental impacts of digital technologies cannot be fully understood by focusing on their features, users, or adoption alone (Babel et al., 2022; Chamakiotis et al., 2021; Chamakiotis & Petrakaki, 2025; Gholami et al., 2016; Pang et al., 2024; Spiekermann et al., 2022). Instead, they must be situated within the economic, infrastructural, and institutional arrangements through which digital value is produced. NFTs provide a particularly visible case in which the benefits and socio-environmental costs of digital value creation are distributed unevenly across actors and places. The Capitalocene lens draws attention to these distributional asymmetries and the structures through which they are produced.

4 From participation to exposure: extending the digital divide

The analysis above points to an additional dimension in how IS research conceptualises digital inequality. The concept of the digital divide has been central to understanding inequality in digital contexts, and important work has progressively expanded it from physical access to skills, usage, participation, digital justice, and adverse incorporation (Chamakiotis et al., 2022; Heeks, 2022; Pang et al., 2024; van Dijk, 2020). Our argument does not challenge these developments. Rather, the case of NFTs reveals an additional dimension that becomes visible when digital inequality is considered through the tension between value creation and socio-environmental cost externalisation: participation and exposure need not coincide. A relatively small group may capture economic value from digital markets, while broader environmental and social costs are externalised to populations that may not participate in these systems whatsoever.

This distinction shifts the analytical boundary of digital inequality. Access-oriented questions ask who can participate, under what conditions, and with what benefits. An exposure-oriented perspective additionally asks who bears the costs of digital innovation, whether or not they participate in the focal system. In the case of NFTs, market participation, value capture, infrastructural responsibility, and environmental exposure can be distributed across different actors and places. We conceptualise the separation between those who participate in, and capture value from, digital innovation and those who bear its wider costs as a digital socio-environmental tension. Analysing this tension requires attention to the relationship between participation, value capture, responsibility, and exposure. Whether and how similar tensions arise in other digital contexts depends on the particular configuration of technologies, markets, infrastructures, institutions, and practices through which digital value is produced.

5 Toward a new research agenda for IS

If participation, value capture, responsibility, and exposure do not necessarily coincide, IS research needs approaches capable of tracing how these relationships are configured across actors, infrastructures, and places. Building on our preceding analysis, we outline four directions for investigating this digital socio-environmental tension.

5.1 Tracing participation, value capture, and exposure

A first direction is to broaden analyses of digital inequality by considering exposure alongside access, use, and participation. Future research could examine when participation, value capture, responsibility, and exposure coincide and when they become distributed across different actors and places. Such work could investigate, for example, how users, platform operators, infrastructure providers, local communities, and non-users occupy different positions within the same digital value system. Multidimensional approaches could further examine how factors such as income, geography, gender, race, and class intersect with both the benefits and harms of digital technologies.

Comparative case studies and stakeholder mapping could be particularly useful for tracing these relationships across different digital technologies and infrastructural settings. For example, studies of NFT markets could combine infrastructure and exposure mapping with interviews with creators, platform operators, infrastructure providers, and affected communities to establish whether exposure coincides with participation, value capture, or influence over infrastructural decisions.

5.2 Integrating climate justice into IS research

A second direction is the integration of climate justice perspectives into IS research to examine how responsibility for socio-environmental costs and exposure to their consequences may be unevenly distributed. While sustainability has become an important topic in the IS discipline, much of the existing work focuses on how digital technologies can contribute to environmental efficiency or 'green' innovation. Less attention has been paid to how these technologies may exacerbate environmental inequalities.

Climate justice perspectives emphasise the uneven distribution of environmental harms and responsibilities, highlighting how vulnerable populations are often disproportionately affected by ecological degradation despite contributing least to its causes. Applying this lens to digital technologies would shift the focus from efficiency to equity, raising questions about who is exposed to the environmental consequences of digital infrastructures and who has the capacity to mitigate or adapt to them.

For IS researchers, this raises questions about where digital infrastructures are located, whose resources they consume, which communities experience their environmental consequences, and whether those communities participate in, or benefit from, the digital systems these infrastructures support. Location-based studies of digital infrastructures and affected communities, potentially combined with infrastructure or supply-chain analysis, could help make these relationships empirically visible. They could examine whether communities exposed to resource demands or pollution have a voice in siting and governance decisions, distinguishing the distribution of burdens from the capacity to influence them.

5.3 Accounting for externalities in digital innovation

A third direction is the need to more systematically account for externalities in the study of digital technologies. IS research has traditionally focused on the intended benefits of digital innovation, such as efficiency gains, improved decision-making, and enhanced user

experiences. Unintended consequences are often treated as secondary or addressed only after they become visible in practice.

Building on recent calls to more systematically study unintended consequences in IS research (Benbya et al., 2025), we suggest that externalities, particularly environmental and social ones, should be treated as a central object of analysis rather than a peripheral concern. This requires examining the socio-technical mechanisms through which costs generated by digital innovation extend beyond focal users and organisations. Particular combinations of technological architectures, market incentives, governance arrangements, and infrastructural dependencies may shape where such costs arise, who benefits from the associated digital value creation, and who ultimately bears the consequences.

The rapid expansion of Generative Artificial Intelligence (GenAI) makes this question particularly salient beyond the NFT context. Like blockchain-based markets, GenAI services that appear largely immaterial to users depend on extensive physical infrastructures, including data centres, computing hardware, energy, and water (Xiao et al., 2025). The resulting environmental implications extend beyond carbon emissions alone and raise broader questions about the social and ecological costs and benefits of these systems (Bossert & Loh, 2025). Studying GenAI through an externalities lens therefore raises similar questions about the relationship between those who develop, deploy, and benefit from digital systems and the populations and places exposed to the resource demands and environmental consequences of the infrastructures supporting them.

Comparative research across technologies and infrastructural configurations could help identify when and how externalisation occurs and whether technological or governance interventions reduce socio-environmental costs or redistribute them elsewhere. Such work could combine socio-technical analysis with lifecycle assessments, infrastructure studies, or stakeholder mapping to trace consequences beyond direct users and organisations. For example, comparative studies of similar NFT applications on different blockchain and hosting infrastructures could combine lifecycle assessments with interviews about design and governance decisions. Specifying the assessment boundary and distinguishing allocated from additional resource demands would help establish whether interventions reduce total burdens or redistribute them across actors and places.

5.4 Advancing critical futures thinking in digital innovation

While the preceding directions help identify and explain existing socio-environmental tensions, critical futures thinking offers a means of examining how such tensions may emerge, intensify, or shift as digital technologies develop. We therefore call for greater engagement with critical futures thinking in IS research. Digital technologies are often studied through techno-optimistic lenses that emphasise progress, innovation, and growth. While such perspectives are valuable, they may also obscure the long-term socio-environmental trajectories of digital systems.

Critical futures thinking encourages researchers to question dominant narratives of technological progress and to explore alternative futures that prioritise sustainability, equity, and resilience. This involves not only anticipating potential risks and unintended

consequences, but also imagining how digital technologies could be designed and governed differently to produce more just and sustainable outcomes.

For IS research, this implies moving beyond short-term analyses of adoption and performance toward a more reflexive engagement with the broader societal implications of digital innovation. Scenario development and other futures-oriented approaches could enable researchers to examine who may benefit from emerging digital infrastructures, who may become exposed to their consequences, and how alternative technological or governance arrangements could change the distribution of these outcomes. For example, scenarios combining different levels of market activity, energy supply, and accountability could examine how changes in infrastructure alter both total burdens and their distribution. Such work also opens the door to interdisciplinary collaboration with fields such as environmental science, political economy, and science and technology studies.

6 Conclusion

In an era in which IS scholars emphasise the discipline's potential to contribute to a better world (Davison et al., 2023), our provocation draws attention to a socio-environmental tension that deserves greater consideration in how we conceptualise digital innovation. Digital technologies can generate legitimate opportunities for participation and value creation while the socio-technical arrangements enabling these opportunities may simultaneously externalise environmental and social costs. Using NFTs as a revealing case, we show how the benefits and costs associated with digital value creation can be distributed unevenly across actors and places. The Capitalocene provides a productive lens for making these distributional asymmetries visible by directing attention to the broader economic, infrastructural, and institutional arrangements through which digital value is produced.

For IS research, the resulting provocation is not that existing understandings of digital inequality are wrong, but that participation and exposure need not coincide. Understanding the societal implications of digital innovation therefore requires attention to who participates, who captures value, who bears responsibility, and who is exposed to its consequences. Whether and how these relationships become separated depends on the particular socio-technical configurations through which digital innovation unfolds, making their identification and explanation an important task for future IS research. The digital divide asks who is excluded from digital benefits. Our provocation adds another question: Who is included in digital harms?

References

- Babel, M., Gramlich, V., Körner, M. F., Sedlmeir, J., Strüker, J., & Zwede, T. (2022). Enabling end-to-end digital carbon emission tracing with shielded NFTs. *Energy Informatics*, 5(1), 1–22. doi.org/10.1186/s42162-022-00199-3
- Beinke, J., Schleh, D., Högemann, M., & Teuteberg, F. (2023). "Right-click, Save As" is dead; long live "Right-click, Save As"!—Understanding profile picture NFT business models in Web3. *Proceedings of the 44th International Conference on Information Systems, ICIS 2023*, 1–11. aisel.aisnet.org/icis2023/blockchain/blockchain/11

- Benbya, H., Strich, F., & Trieu, V. H. (2025). Accounting for Unintended Consequences in IS Research: A Call to Action. *Australasian Journal of Information Systems*, 29, 1–2. doi.org/10.3127/ajis.v29.6063
- Bossert, L. N., & Loh, W. (2025). Why the carbon footprint of generative large language models alone will not help us assess their sustainability. *Nature Machine Intelligence*, 7, 164–165. doi.org/10.1038/s42256-025-00979-y
- Burks, Z., Morgan, J., Malone, B., & Seibel, J. (2020, September 15). ERC-2981: NFT royalty standard. *Ethereum Improvement Proposals*. eips.ethereum.org/EIPS/eip-2981
- Chalmers, D., Fisch, C., Matthews, R., Quinn, W., & Recker, J. (2022). Beyond the bubble: Will NFTs and digital proof of ownership empower creative industry entrepreneurs? *Journal of Business Venturing Insights*, 17, e00309. doi.org/10.1016/j.jbvi.2022.e00309
- Chamakiotis, P., Aljabr, N., & Masiero, S. (2022). Social Media and Forced Migration: The Emergence of a Hybrid Social. *Proceedings of the 43rd International Conference on Information Systems, ICIS 2022*, 1–9. aisel.aisnet.org/icis2022/social/social/2
- Chamakiotis, P., & Petrakaki, D. (2025). Exploring Alternative (Non-Economic) Forms of Value Engendered by Digital Platforms. *Information Systems Journal*, 35(4), 1093–1100. doi.org/10.1111/isj.12576
- Chamakiotis, P., Petrakaki, D., & Panteli, N. (2021). Social value creation through digital activism in an online health community. *Information Systems Journal*, 31(1), 94–119. doi.org/10.1111/isj.12302
- Crutzen, P., & Stoermer, E. (2000). The ‘Anthropocene’. *Global Change Newsletter. International Geosphere–Biosphere Programme (IGBP)*, 41, 17–18.
- Davison, R. M., Majchrzak, A., Hardin, A., & Ravishankar, M. N. (2023). Special issue on responsible IS research for a better world. *Information Systems Journal*, 33(1), 1–7. doi.org/10.1111/isj.12405
- Entriiken, W., Shirley, D., Evans, J., & Sachs, N. (2018, January 24). ERC-721: Non-fungible token standard. *Ethereum Improvement Proposals*. eips.ethereum.org/EIPS/eip-721
- Ethereum Foundation. (n.d.). *Ethereum’s energy consumption*. Ethereum.Org. Retrieved May 29, 2026, from ethereum.org/en/developers/docs/consensus-mechanisms/pos/energy-consumption/
- Gholami, R., Watson, R. T., Hasan, H., Molla, A., & Bjorn-Andersen, N. (2016). Information Systems Solutions for Environmental Sustainability: How Can We Do More? *Journal of the Association for Information Systems*, 17(8), 521–536. doi.org/10.17705/1jais.00435
- Gore, T., Alestig, M., & Ratcliff, A. (2020). Confronting Carbon Inequality. *Oxfam Media Briefing, September*.
- Guidi, G., Dominici, F., Steinsultz, N., Dance, G., Henneman, L., Richardson, H., Castro, E., Bargagli-Stoffi, F. J., & Delaney, S. (2025). The environmental burden of the United States’ bitcoin mining boom. *Nature Communications*, 16(1), 2970. doi.org/10.1038/s41467-025-58287-3

- Heeks, R. (2022). Digital inequality beyond the digital divide: conceptualizing adverse digital incorporation in the global South. *Information Technology for Development*, 28(4), 688–704. doi.org/10.1080/02681102.2022.2068492
- Intergovernmental Panel on Climate Change (IPCC). (2023). *Climate change 2023: Synthesis report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. doi.org/10.59327/IPCC/AR6-9
- Kinsley, S. (2014). The matter of “virtual” geographies. *Progress in Human Geography*, 38(3), 364–384. doi.org/10.1177/0309132513506270
- Lee, C. T., Li, Z., & Shen, Y.-C. (2024). Building bonds: an examination of relational bonding in continuous content contribution behaviors on metaverse-based non-fungible token platforms. *Internet Research*, 34(6), 2057–2095. doi.org/10.1108/INTR-11-2022-0883
- Maitland, A., Lawson, M., Stroot, H., Poidatz, A., Khalfan, A., & Dabi, N. (2022). Carbon billionaires. In *Oxfam International*. doi.org/10.21201/2022.9684
- Malm, A., & Hornborg, A. (2014). The geology of mankind? A critique of the anthropocene narrative. *Anthropocene Review*, 1(1), 62–69. doi.org/10.1177/2053019613516291
- Moore, J. W. (2016). Anthropocene or Capitalocene? Nature, History, and the Crisis of Capitalism. *Sociology Faculty Scholarship*, 1. orb.binghamton.edu/sociology_fac/1
- Nadini, M., Alessandretti, L., Di Giacinto, F., Martino, M., Aiello, L. M., & Baronchelli, A. (2021). Mapping the NFT revolution: Market trends, trade networks, and visual features. *Scientific Reports*, 11(1), 20902. doi.org/10.1038/s41598-021-00053-8
- Pang, M.-S., Kankanhalli, A., Aanestad, M., Ram, S., & Maruping, L. (2024). Digital Technologies and the Advancement of Social Justice: A Framework and Agenda. *MIS Quarterly*, 48(4), 1591–1610. doi.org/10.25300/MISQ/2024/484E3
- Regner, F., Schweizer, A., & Urbach, N. (2019). NFTs in practice - Non-fungible tokens as core component of a blockchain-based event ticketing application. *Proceedings of the 40th International Conference on Information Systems, ICIS 2019*, 1–17. aisel.aisnet.org/icis2019/blockchain_fintech/blockchain_fintech/1
- Richardson, K., Steffen, W., Lucht, W., Bendtsen, J., Cornell, S. E., Donges, J. F., Drüke, M., Fetzer, I., Bala, G., von Bloh, W., Feulner, G., Fiedler, S., Gerten, D., Gleeson, T., Hofmann, M., Huiskamp, W., Kummu, M., Mohan, C., Nogués-Bravo, D., ... Rockström, J. (2023). Earth beyond six of nine planetary boundaries. *Science Advances*, 9(37), 1–16. doi.org/10.1126/sciadv.adh2458
- Richter, A., Leyer, M., Black, S., & Davern, M. (2026). Tensions: A lens for provoking debate on contemporary information systems developments. *Australasian Journal of Information Systems*, 30. doi.org/10.3127/ajis.v30.6676
- Seidel, S., Bharati, P., Watson, R. T., Boudreau, M. C. M., Kruse, L. C., Karsten, H., Melville, N., Toland, J., Fridgen, G., Albizri, A., Butler, T., Guzman, I., Lee, H., Rush, D., & Watts, S. (2017). The sustainability imperative in information systems research. *Communications of the Association for Information Systems*, 40(1), 40–52. doi.org/10.17705/1cais.04003
- Spiekermann, S., Krasnova, H., Hinz, O., Baumann, A., Benlian, A., Gimpel, H., Heimbach, I.,

- Köster, A., Maedche, A., Niehaves, B., Risius, M., & Trenz, M. (2022). Values and Ethics in Information Systems: A State-of-the-Art Analysis and Avenues for Future Research. *Business and Information Systems Engineering*, 64(2), 247–264. doi.org/10.1007/s12599-021-00734-8
- Steffen, W., Broadgate, W., Deutsch, L., Gaffney, O., & Ludwig, C. (2015). The trajectory of the anthropocene: The great acceleration. *Anthropocene Review*, 2(1), 81–98. doi.org/10.1177/2053019614564785
- Taffel, S. (2023). AirPods and the earth: Digital technologies, planned obsolescence and the Capitalocene. *Environment and Planning E: Nature and Space*, 6(1), 433–454. doi.org/10.1177/25148486221076136
- Tarafdar, M., & Davison, R. M. (2018). Research in information systems: Intra-disciplinary and inter-disciplinary approaches. *Journal of the Association for Information Systems*, 19(6), 523–551. doi.org/10.17705/1jais.00500
- Tavares, A. P., Whitley, E., Nordhaug, L. M., Sæbø, J., Raghavan, M., Senyo, P., & Masiero, S. (2023). Digital Public Goods and vulnerable populations. *ECIS 2023 Panels*, Kristiansand, Norway. aisel.aisnet.org/ecis2023_panels/2
- United Nations Development Program (UNDP). (2023). *UNDP Human Climate Horizons*. horizons.hdr.undp.org/
- United States Patent and Trademark Office (USPTO) & United States Copyright Office. (2024). *Non-fungible tokens and intellectual property: A report to Congress*. www.copyright.gov/policy/nft-study/Joint-USPTO-USCO-Report-on-NFTs-and-Intellectual-Property.pdf
- van Dijk, J. A. G. M. (2020). *The digital divide*. Polity Press.
- Vassilakopoulou, P., & Hustad, E. (2023). Bridging Digital Divides: a Literature Review and Research Agenda for Information Systems Research. *Information Systems Frontiers*, 25(3), 955–969. doi.org/10.1007/s10796-020-10096-3
- Xiao, T., Nerini, F. F., Matthews, H. D., Tavoni, M., & You, F. (2025). Environmental impact and net-zero pathways for sustainable artificial intelligence servers in the USA. *Nature Sustainability*, 8. doi.org/10.1038/s41893-025-01681-y

Copyright

Copyright © 2026 Oberhauser, M., Lima, V., & Chamakiotis, P. This is an open-access article licensed under a Creative Commons Attribution-Non-Commercial 4.0 Australia License, which permits non-commercial use, distribution, and reproduction in any medium, provided the original author and AJIS are credited.

doi: <https://doi.org/10.3127/ajis.v30.6562>

