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Disruptive Technologies for e-Diasporas: Blockchain, DAOs, Data Cooperatives, Metaverse, and ChatGPT

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ABSTRACT

E-diasporas are networks driven by human agency, connecting digital citizens to their home countries and diasporic fellows through digital tools. In contrast, Hyperconnected Diasporas (HD) are data-driven networks engaged in extractive activities, often employed for government (para) diplomacy, heavily relying on social media extractivist data-opolies or Big Tech platforms. This article examines the impact of disruptive technologies on e-diasporas in the context of data extractivism, particularly stemming from HD. The article pursues a dual objective: (i) reviewing existing literature and comparing five disruptive technologies—Blockchain, Decentralized Autonomous Organizations (DAOs), Data Cooperatives, Metaverse, and ChatGPT—in sustaining e-diasporas as networks driven by human agency, and (ii) scrutinizing associated opportunities and risks, including challenges to institutional trust and data privacy arising from HD. The study seeks to elucidate how these technologies may either hinder or exacerbate the impacts of HD on e-diasporas, characterized by their human-driven nature. The article begins with an introduction to HD, followed by a literature review on e-diasporas. Methodologically, it presents a comparative analysis of the five disruptive technologies concerning the research question and discusses their implications for e-diasporic communities, concluding with final remarks.

1. Hyperconnected Diasporas: Shedding Light on the Big (Tech) Problem

E-diasporas—as networks driven by human agency—are communities of diasporic citizens who use digital technologies and data platforms to connect with each other and their homelands in datafied societies (Hintz et al., 2019; Ponzanesi, 2020). Datafied societies are currently experiencing an increasing use of digital platforms, which enable global access to citizens' digital identities (Sullivan & Burger, 2017; Tammpuu & Masso, 2018). Therefore, in datafied societies, the identities of diasporic citizens are becoming highly important as individuals navigate online spaces and interact with each other.

In an era where the digital landscape evolves at warp speed, the reliance of digital citizens on Big Tech has raised a complex issue around trust that demands our undivided attention (Calzada, 2022d). These disruptive technologies (Grabher & König, 2020), as a

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result of creative destruction processes (Schumpeter, 1942), have brought immeasurable benefits to billions of people, including improved health, employment, and well-being (Burr & Floridi, 2020). Especially during times of crisis, disruptive technologies have played an increasingly critical role in human and societal survival, particularly within the contemporary political economy encompassing various relational and institutional aspects of capitalism (Polanyi, 1944; West, 2019). Disruptive technologies have played a pivotal role, for example, in global conflicts and natural disasters, including extreme weather events resulting in the displacement of large numbers of people. Furthermore, disruptive technologies in the pandemic era have also transformed communities and ways of living and working, giving rise to a new pattern known as 'pandemic citizenship' (Bignami et al., 2023; Calzada, 2022d). However, these disruptions can also lead to unforeseen destructive consequences. The harms of dominant and data-opolistic technology platforms are manifold (Stucke, 2022; Löhr, 2023). They include the exploitation of data, impacts on the mental health and safety of minors, the proliferation of misinformation, and adverse effects on political institutions and behavior. Big Tech, particularly social media companies, has thus become the subject of public scrutiny and criticism. Hence, both internal company initiatives and external bipartisan attempts to address these issues have met with limited success (Spelliscy et al., 2023; Srivastava, 2021).

Against this backdrop, governments worldwide have recently intensified their efforts to support e-diasporas in response to the pandemic (Bignami et al., 2023). However, these efforts often rely on social media extractivist Big Tech platforms, which we refer to as Hyperconnected Diasporas (HD) in this article. This reliance poses a potential threat to institutional trust and the data privacy of digital citizens (Cancela, 2023; Echeverría, 1999; Lehdonvirta, 2022; Spelliscy et al., 2023). During and after the pandemic, data flows, transfers, migrations, and algorithmic disruptions have become commonplace, impacting the digital rights of citizens and undermining their data privacy (Van Dijck, 2018). Mainstream data extractivism, extending across deep, biometric, and postpandemic borders, places digital citizens at a greater risk of data privacy breaches, revealing a dominant totalitarian order in the global digital landscape (Arendt, 1966). Newport argues that "our current relationship with technology is unsustainable" (2019, p. xi), given the harms of dominant technology platforms, including data exploitation, the proliferation of misinformation, and negative impacts on political institutions and behaviors, which affect democracy as a whole (Hildebrandt, 2021). HD, therefore, results from the actions of Big Tech, especially those of social media companies that exploit our data without public scrutiny or criticism (Stucke, 2022; Toscano, 2021). Consequently, a significant issue arises with Big Tech, which extends to the field of diaspora engagement. Big Tech operates for the profit of its shareholders and individual owners like Elon Musk (X). Due to its monopolistic gravitational pull and substantial network effects, diasporic citizens often have nowhere else to turn if they want to stay connected to their home and global communities. This article focuses on this data-opolistic trend, referring to it as HD.

Data extractivism refers to the practice of collecting, analyzing, and commodifying large amounts of personal data from digital citizens without their explicit consent or control, often for commercial or political purposes (Sadowski, 2019). This practice involves using digital technologies, such as social media platforms, to gather personal data, including online behavior, preferences, and demographic information, and converting it into an asset for companies and governments (O'Shea, 2021). Consequently, data extractivism poses a challenge to the ethical and democratic governance of datafied societies, emphasizing the imperative to protect the digital rights of citizens (Calzada, 2021a; Cancela, 2023; Zuboff, 2019). To further illustrate data extractivism, Stucke raises an insightful question: Why have Google, Apple, Facebook, Amazon, and Microsoft (GAFAM), successfully dominated multiple markets for years and seem poised to continue their domination over the next decade? These data-opolies, referring to dominant data-driven companies, have exerted significant influence over the digital economy. As Stucke (2022) states, "the price we pay includes our privacy, attention, and autonomy" (p. 1). According to Stucke, four well-accepted factors explain this dominant trend of data-opolies impacting the data sustainability of digital citizens (European Commission, 2020). These factors include: (i) economies of scale, (ii) network effects, (iii) attention, and (iv) the four Vs of personal data—volume, variety, velocity in processing, and value.

The intricate relationship between disruptive technologies and data extractivism lies at the core of contemporary digital landscapes. In the context of e-diaspora platforms, the convergence of technologies such as blockchain, DAOs, data cooperatives, the Metaverse, and ChatGPT holds immense potential for fostering cross-border connections and preserving cultural identities. However, this potential is intertwined with the risk of data extractivism, where valuable personal and cultural data of diaspora members may be harvested without their consent or equitable compensation. Disruptive technologies provide the infrastructure for efficient data collection, analysis, and utilization (Grabher & König, 2020). While blockchain and data cooperatives can empower users by granting them control over their data and ensuring ethical data governance, the Metaverse and AI models like ChatGPT can inadvertently become conduits for data extractivism if not appropriately regulated. The challenge lies in striking a delicate balance: leveraging these technologies to empower diaspora communities while safeguarding against exploitative practices. Recognizing the intricate interplay between disruptive technologies and data extractivism is essential for charting a sustainable course in the evolving digital landscape.

Consequently, in this article, the term HD (Calzada, 2022b)—networks engaged in data-driven extractive activities—is used to describe the prevailing trend of data governance in e-diasporic interactions, including those involving governments, diasporic citizens, as well as interactions among them (Madison, 2020). Therefore, HD are defined as follows: (i) they represent the singular techno-deterministic and dominant interpretation of datafication in global processes, driven by data-opolistic practices (Calzada, 2022d; Stucke, 2022; Van Dijck, 2014). This (ii) subsequently leads to data privacy risks for diasporic citizens who are (iii) unwittingly exposed to surveillance capitalism through continuous tracking by Big Tech social media platforms (Srivastava, 2021; Taplin, 2017; Zuboff, 2019). These digital risks for diasporic citizens include the loss of privacy, the dispossession of their data ownership (Hicks, 2022), and, consequently, their vulnerability when intensive AI-driven biometric authentication is employed (Calzada, 2022a, 2022b; Veliz, 2020). In several ways, the digital transformation in public life has reneged on its progressive promises, instead becoming associated with the monopolistic appropriation of technologies and control of infrastructure, resulting in a decline in the quality of democratic debate. Consequently, HD is an unfavorable characterization assigned to datafication processes in Hyperconnected Societies that unquestioningly accept the pitfalls and paradoxes related to the digital (un)sustainability of surveillance capitalism

(Calzada, 2023c; Newport, 2019; Van Dijck, 2018). Therefore, while e-diasporas are networks driven by human agency (Ponzanesi, 2020; Diminescu, 2012), HD might be perceived as dysfunctional networks of data-driven activities entirely reliant on data extractivism, a consequence of contemporary Hyperconnected Societies led by Big Tech (Calzada & Cobo, 2015).

To shed light on the problem exposition, Bucher (2012), Forestal (2020), and Taplin (2017) argue that Big Tech platforms, such as Google and Facebook, exploit the obscurity and black-box nature of AI (Lanier, 2023) through algorithms and opaque content moderation policies to determine which content receives priority and promotion on their platforms. According to these critics, this practice potentially amplifies misinformation and fosters the formation of echo chambers. They further contend that it obscures the true nature of the content presented, eroding public trust and polarizing public opinion (Pierson, 2021). In the dynamic landscape of data commodification, trust emerges as a paramount currency and form of capital, profoundly influencing the equilibrium of e-diaspora platforms. As diaspora communities increasingly engage with disruptive technologies like blockchain, DAOs, data cooperatives, the Metaverse, and ChatGPT, the interplay between data and trust takes center stage. Complexities of trust serve as the bedrock upon which e-diaspora members are willing to exchange their personal and cultural data within these platforms, instilling confidence in the security of data transactions and privacy safeguards, and fundamentally shaping their willingness to participate and share. The study by Becker and Bodó (2021) on trust in blockchain-based systems elucidates how these technologies, characterized by transparency and security, can reinforce this essential trust. However, it also underscores the delicate balance required, as an overemphasis on data monetization can potentially undermine trust if not managed ethically. Within this evolving paradigm, understanding, nurturing, and preserving the intricate relationship between data and trust becomes pivotal for the sustainable development of e-diaspora platforms, where trust indeed serves as both currency and capital in the ever-expanding domain of data commodification.

However, supporters of these platforms argue that they prioritize free speech and user autonomy while also acknowledging the need to address issues such as misinformation and harmful content. Veliz (2020) suggests that increasing transparency and accountability in the algorithms and content moderation policies of these platforms could help mitigate these privacy concerns. Nonetheless, Gorwa (2019) contends that regulating these platforms is a multifaceted and complex issue requiring a nuanced approach. Zook openly poses the question (2023, p. 1), "Might this power be countered via regulation, alternative models to corporate platforms organized around cooperatives and unions, or technologies designed to decentralize power and decision-making?" Blockchain, Decentralized Autonomous Organizations (DAOs), and data cooperatives often emerge as alternative models challenging the authority of centralized corporate platforms (Spelliscy et al., 2023; Hubbard, 2023). This article examines five disruptive technologies regarding their potential and limitations in addressing the data-opolistic trend of HD. These technologies encompass not only blockchain, DAOs, and data cooperatives but also the Metaverse and ChatGPT.

Considering the arguments and counterarguments in this ongoing debate, an alternative and widespread response has emerged from crypto-libertarian or pseudo-anarchist positions. This has given rise to a growing body of literature on decentralized systems in peer-to-peer interactions, with a particular focus on blockchain (Tapscott & Tapscott, 2016; Zook, 2023), DAOs (Buterin, 2022; Mathew, 2016; Monsees, 2019; Rennie et al., 2022; Rodima-Taylor & Grimes, 2019), and data cooperatives (Bühler et al., 2023a; Spelliscy et al., 2023). Blockchain technology can aid in creating secure and decentralized environments for these platforms, ensuring the privacy and protection of users' data and interactions. DAOs could improve decision-making efficiency and collaboration among diaspora communities, as well as enable the development of decentralized platforms for economic and social exchange within these networks. Additionally, data cooperatives are gaining momentum as another alternative pathway in international digital policy forums (Bühler et al., 2023a; Mannan & Pek, 2023). Among these decentralized disruptive technologies, the emergence of the Metaverse and ChatGPT has significantly impacted the digital sphere, particularly in the context of e-diasporas. The incorporation of Metaverse technology holds the potential to enhance and expand the development of e-diaspora by utilizing digital platforms to connect diasporic communities. However, it is important to note that the full implications of implementing these disruptive technologies are not yet fully understood (Ball, 2022). As a large language model, ChatGPT can serve blockchain-driven e-diaspora platforms by facilitating communication and interaction among users. Its advanced natural language processing capabilities enable a more personalized and immersive experience for platform users. ChatGPT's ability to understand and respond to natural language queries provides instant assistance, making the e-diaspora platform more user-friendly. Moreover, its language generation capabilities can create engaging and interactive experiences, such as chatbots or virtual assistants (HanHemen, 2023).

In the context of this article, disruptive technologies refer to new applications, tools, and platforms driven by Web3 that fundamentally change the way diaspora communities connect, interact, and contribute to their countries of origin or residence. Web3, often referred to as the Semantic Web or the Decentralized Web, represents the next phase of the Internet's evolution (Barlow, 1996), focusing on smarter, more interconnected, and decentralized information (Berners-Lee et al., 2001). The five emerging technologies introduced and compared in this article have the potential to displace existing communication methods and restructure the way diaspora communities engage with each other and their home countries. However, and this is the fundamental hypothesis of this article, their impact depends not only on how the dominant players in the Big Tech industry configure their technological and institutional settings but also on how multistakeholder policy frameworks (such as the Penta Helix framework; Calzada, 2021c) at the regional level self-regulate their data-driven economies and societies, as demonstrated by people-centered smart cities globally encompassing the *Cities Coalition for Digital Rights* (CCDR) and advocated by UN-Habitat (Calzada et al., 2021; Farrell et al., 2023). As such, in the face of the formidable challenges posed by Big Tech's unchecked data practices, a beacon of hope emerges on the digital horizon in the form of Web3 technologies (Stanford DAO Workshops, 2022 and 2023,2023). Web3, driven by the principles of decentralization, transparency, and data sovereignty, offers a potent antidote to the unsustainable data practices that have come to define the digital age. At its core, Web3 represents a fundamental shift in how we conceive and manage data, fostering a sustainable vision of the digital future. In the world of Web3, blockchain technology, underpinning cryptocurrencies like Ethereum (Buterin, 2022), takes center stage as a decentralized ledger that ensures data integrity and immutability (Hughes et al., 2019). This digital

foundational economic model empowers individuals, reclaiming their digital identities from the grasp of monolithic tech giants (Morozov, 2022).

However, Web3's true revolutionary potential extends beyond blockchain (Viano et al., 2023; Zook, 2023). It gives birth to DAOs, autonomous entities governed by code and consensus, where decisions are made collectively by stakeholders rather than dictated by corporate hierarchies (Stanford DAO Workshops 2022 and 2023, 2023; WEF, 2023). This shift towards decentralized governance challenges the very core of Big Tech's dominance, offering a more equitable and democratic approach to data management. In this digital utopia, data cooperatives emerge as key players, enabling individuals to collectively manage and profit from their data (Calzada, 2021b; Bühler et al., 2023a). Digital citizens are no longer mere consumers; they become active participants, shaping the rules and benefits of the data ecosystem they are a part of (Bignami et al., 2023; Farrell et al., 2023). What makes Web3 truly utopian is its inherent resistance factor. It is a grassroots movement that resists the centralization of data power and envisions a world where digital citizens regain control over their online lives. Web3 pioneers a sustainable ethos that champions data privacy, environmental responsibility, and economic fairness. By aligning with Web3, we embark on a journey towards a digital future where the unsustainable practices of Big Tech are replaced by a more equitable, sustainable, and democratic data ecosystem. The promise of Web3 lies not only in its technological innovations but in the empowerment of digital citizens to shape a future where data serves the collective good, where sustainability, privacy, and resilience are paramount (Burrell & Fourcade, 2021). In this way, Web3 charts a path towards a digital utopia, where the people reclaim their data destiny and forge a more sustainable and just digital world.

While it may be premature to provide a comprehensive evaluation of these technologies' effects, the primary goal is to compare them in terms of their potential to either hinder or exacerbate the impacts of HD. The article pursues a dual objective: (i) to review existing literature and subsequently offer a comparative analysis of five disruptive technologies, evaluating their potential to sustain e-diasporas as networks of human-driven agency, and (ii) to explore their exposure to potential risks related to digital downsides. These risks encompass challenges pertaining to institutional trust and data privacy, which stem from HD as networks primarily driven by data-centric activities. In particular, this article poses the following research question: How do these disruptive technologies affect e-diasporas, which operate as networks of human-driven agency, and do they hinder or exacerbate the impacts of HD, which function as networks predominantly driven by data-centric activities?

Given the article's ambition to reach a broad readership by introducing novel and critical approaches, its perspective is inherently transdisciplinary. Rooted in the multistakeholder policy framework known as the Penta Helix, it encompasses the private sector, comprising not only Big Tech but also small startups, public authorities, academia, civil society, and social entrepreneurs and data activists (Calzada & Cowie, 2017). Consequently, this article addresses a wide array of stakeholders due to its significant implications for future social, cultural, economic, and political developments. Therefore, it endeavors to be accessible to all of these stakeholders without distinction.

The subsequent section of this article presents a comprehensive literature review focused on e-diasporas. Following this, it delves into a comparative analysis of the five disruptive technologies and their potential implications for e-diasporas. Finally, the article concludes with the final remarks.

2. Literature Review: e-Diasporas Alongside Five Disruptive Technologies

When exploring the intersection of e-Diasporas and disruptive technologies fueled by Artificial Intelligence (AI) (Gruetzemacher & Whittlestone, 2022; Van Noordt & Tangi, 2023), it is crucial to consider how technological advancements have impacted diaspora communities worldwide. Disruptive technologies can be defined as innovations that bring about significant changes in the way diaspora citizens operate, leading to the replacement of existing systems or habits, and subsequently, either benefiting or harming them (Grabher & König, 2020; Newport, 2019; Polanyi, 1944; Schumpeter, 1942). While some argue that these developments have brought diasporas closer together, others highlight how these same tools can exacerbate existing inequalities and marginalization within these communities. Understanding these complex dynamics requires a nuanced approach that considers both the positive and negative aspects of the digital age. By analyzing the current literature on this topic from a digital anthropological perspective, we can gain a better understanding of the challenges and opportunities facing e-Diasporas in the context of disruptive technologies (Boellstorff, 2012; Newman et al., 2022; UNESCO, 2023).

Disruptive technologies associated with emerging digital citizenship regimes (Calzada, 2022a; Cheney-Lippold, 2016) are reshaping practices related to "e-diasporas" and significantly influencing the paradiplomatic agency of governments through cyber-diplomacy in the digital age (Riordan, 2019). Consequently, the impact of COVID-19 has intensified digitalization and led to the creation of new academic literature related to e-diasporas, digital citizenship, and disruptive technologies (Calzada, 2022a). This literature covers various topics, including (i) e-diasporas (Ponzanesi, 2020), (ii) digital deep borders (Amoore, 2021), (iii) blockchain technologies (De Filippi et al., 2020; DuPont, 2017), (iv) algorithmic nations (Calzada, 2018; Cheney-Lippold, 2016; Calzada and Bustard, 2022), (v) cloud geographies (Orgad & Bauböck, 2018), (vi) Cloud Empires (Echeverría, 1999; Lehdonvirta, 2022), (vii) public diplomacy and cyberdiplomacy (Manor, 2021), and (viii) digital nomadism (Calzada, 2023a; Cook, 2022; D'Andrea, 2006; Kannisto, 2016; Sutherland, 2014).

There is no consensus on the definition of "e-diaspora" because the concept encompasses various disciplinary perspectives and media-specific variations, such as "digital diasporas", "net-diasporas", and "web-diasporas". However, there is agreement on how digital connectivity has profoundly transformed spatiality, belonging, and self-identification (Ponzanesi, 2020). According to Ponzanesi (p. 977), "e-diasporas provide new possible cartographies to map the self in relation to increasingly complex patterns of globalization and localization, while avoiding closures and the negative effects of identity politics." This understanding of e-diaspora does not imply that the traditional notion of diaspora, whether analogic or face-to-face, has been superseded or replaced by new digital

diasporas. Instead, digital technologies enable, transform, and expand the possibilities for further diasporic affiliations, subject to novel algorithmic and biometric disruptions characterized by ongoing digital global orders, data regulations, and cross-border transactions including the General Data Protection Regulation (GDPR) (Finck, 2018), the California Consumer Privacy Act (CCPA), and the recent Chinese regulation called Personal Information Protection Law (PIPL) (Calzada, 2022c; Khan et al., 2022).

As we observe, the notion of "e-diasporas" remains valid as it adds a digital layer to the emotional and analog aspects. However, it is equally true that the digital-related risk narrative, which does not necessarily have to be dystopic, is largely absent in diaspora studies (Brenda & Collins, 2022). The concept of dataveillance or the loss of privacy within these diasporic affiliations is clearly not present when examining digital communications surrounding diasporic exchanges (Oiarzabal, 2012). Therefore, the longstanding studies on e-diaspora need to adopt a critical data perspective and assess the potential costs of this extensive exposure for users. Digital users are not solely connected users; instead, social media platforms mediate their interactions, often without accountability and limited scrutiny. It is necessary to embrace a timely post-pandemic technopolitical notion that considers digital diasporas in a broader sense, including the impacts of hyperconnectivity and extensive datafication (Risse, 2023). The concept of "e-diasporas" questions and challenges the differences and asymmetries that subtly persist within celebratory discourses about the abolition of digital frontiers. Moreover, "e-diasporas" go further by suggesting that even the potential for the abolition of digital frontiers may introduce additional complexities and asymmetries related to datafication and extractivism (Calzada, 2023c).

Broadly speaking, the academic literature on "e-diasporas" is extensive and covers a wide range of aspects. However, the impacts of the HD are not even slightly addressed (Diminescu, 2012; Oiarzabal, 2012; Ponzanesi, 2020). Similarly, no alternative derived from the literature on the "network state" (Srinivasan, 2022), "translocal geographies" (Brickell & Datta, 2011), "the *diaspora* diaspora" (Brubaker, 2005), "the society of algorithms" (Burrell & Fourcade, 2021), "postpandemic technopolitical democracies" (Calzada, 2022a), "jus algoritmi" (Cheney-Lippold, 2016), "jus nexum" (Calzada, 2023c), "ordinal citizenship" (Fourcade, 2021), "flexible citizenship" (Ong, 1999), "DIY citizenship" (Ratto & Boler, 2014), or "connectography" (Khanna, 2016) has been proposed to address the challenges that e-diasporas pose to disruptive technologies. These challenges include subtle surveillance, brittle dataism (Lohr, 2015; Morozov, 2022; Van Dijck, 2014), and pervasive dystopia (Barlow, 1996; Isin & Ruppert, 2015; Mossberger et al., 2007).

Digital anthropology plays a pivotal role in comprehending e-diasporas, where dispersed communities employ digital tools to maintain connections with their home countries and fellow diasporic members (UNESCO, 2023). This field illuminates how platforms like WhatsApp, Facebook groups, or online forums function as cultural hubs, facilitating the sharing of traditions, news, and support networks across borders (Kim et al., 2018; Ponzanesi, 2020). Moreover, digital anthropology provides a lens through which we can grasp the nuanced ways in which e-diasporas negotiate their identities and navigate complex cultural landscapes in the digital realm. Tom Boellstorff's chapter "Rethinking Digital Anthropology" (2012) underscores the importance of recognizing the digital as a significant domain for anthropological exploration. It calls for a re-evaluation of what constitutes "the field" in anthropology, extending beyond physical locations to encompass digital spaces where cultures and identities are actively constructed and negotiated (Diminescu, 2012; DuPont, 2017; Rennie et al., 2022). Digital anthropology can yield ethnographies on e-diasporas as networks driven by human agency.

HD, often involved in data extractivism, collect, and analyze data from their digital activities to inform (para)diplomatic strategies. Governments, for instance, monitor social media discussions within diaspora communities to gauge political opinions and tailor policies accordingly. However, this practice raises concerns about data privacy among e-diasporas, as their digital interactions are susceptible to exploitation by both governments and corporations. Digital anthropology's ethnographic approach enables an in-depth exploration of these concerns, revealing the complex interplay between digital platforms as bridges connecting diaspora communities and boundaries imposed by data-opolies and governments. This research area, referred to as data migration and transfer, explores how stakeholders define their roles as data providers and decision-makers, effectively becoming data subjects (Calzada, 2018). This intersection of digital anthropology, e-diasporas, and data extractivism carries significant global policy implications regarding data governance, surveillance, and human digital rights. It underscores the importance of transdisciplinary research in understanding the evolving dynamics of diaspora communities in the digital age. Boellstorff's chapter further advocates for anthropologists to actively engage in these digital spaces, adapting ethnographic methods to understand the intricacies of online cultures and identities, making a compelling case for the expansion of anthropological research into the digital realm (Diminescu, 2012). This relevant literature speaks to the generalizability of results.

These disruptive technologies have the potential to revolutionize and enhance the ways in which diaspora communities connect, collaborate, and contribute to their home countries. Disruptive technologies may well determine the digital futures of e-diasporas worldwide (Ho & McConnell, 2017; Singh, 2019) as follows:

(i) Blockchain technology offers secure and transparent decentralized systems, enabling efficient and trustworthy transactions (Inwood & Zappavigna, 2021; Rennie et al., 2022). In the context of diaspora engagement, blockchain can facilitate secure cross-border remittances, reducing costs and improving transparency in financial transactions (Viano et al., 2023). It also empowers diaspora communities to create and manage digital identities, establish property rights, and maintain immutable records for various purposes (Al-Saqaf & Seidler, 2017; Atzori, 2017; Buterin, 2022; De Filippi et al., 2020; Finck, 2018; Kondova & Erbguth, 2020). Rodima-Taylor and Grimes (2019) and Ponzanesi (2020) noted blockchain's potential for the Somali diaspora community, which has relied on traditional money transfer services for decades to send money back to their homeland (Flore, 2018). With blockchain, they found that transactions could be faster, cheaper, and more secure (Werbach, 2019). Remittances constitute a significant source of income for many Somali families, with the diaspora sending billions of dollars back to their homeland each year. However, traditional remittance systems can be slow, expensive, and susceptible to fraud (Naik & Jenkins, 2020). Blockchain technology can address these issues by providing a more secure, efficient, and cost-effective way to transfer money in developing countries of the Global South (Calzada, 2023b; Hughes et al., 2019; Mahula

et al., 2021; Zook, 2023). In the next methodological and comparative section, these cases will be included in the analysis (see Table 1): Blockchain for Humanity, Bitnation, BABB, Tari, AidCoin, World Identity Network, Humaniq, and Golem Network.

(ii) DAOs are organizations run by rules encoded as computer programs on a blockchain network, enabling decentralized decision-making and management (Zichichi et al., 2022). They can empower diaspora communities to collaborate, pool resources, and make collective decisions without relying on centralized authorities (Nabben, 2022). DAOs provide opportunities for diaspora members to engage in governance, investment, and philanthropic initiatives, fostering a sense of ownership and active participation. More recently, Spelliscy et al., (2023, p. 10) define DAOs as "community-led organizations with no formal central authority that use blockchain technology in some capacity, usually to establish the rules of the organization, to record and execute decisions made by members, or to manage a treasury controlled by members." As such, they have the potential to provide e-diasporas with a more democratic and transparent way to manage their affairs. DAOs and DAO tooling have developed at an exponential rate. There are more than 12,000 DAOs, and in 2022 the total value of DAO tokens stood at $21 billion (Spelliscy et al., 2023). However, there is still much research to be done on the potential impact of DAOs on e-diasporas. DuPont (2017) traced the discursive strategies of the developers and the community of investors and found that many community members acknowledged the enormous complexity of DAOs. The World Economic Forum (WEF, 2023) has recently published reports on DAOs and their potential impact on various industries, including finance, supply chain management, and healthcare. To illustrate the potential of this disruptive technology, this article presents the ongoing DAO that is being developed around the *HanHemen* e-diaspora platform (www.hanhemen.eus/en). This e-diaspora platform has been developed in collaboration with the DAO Research Collective at Stanford University, where the author of this article has been regularly working with scholars, practitioners, and policymakers (Stanford DAO Workshops 2022 and 2023, 2023). This case study and illustration have been thoroughly examined (Calzada, 2023a) as part of a Fulbright Award to carry out fieldwork and action research in California, Idaho, and Nevada (Calzada & Arranz, 2022). The basic decentralized infrastructure is driven by blockchain to ensure the implementation of privacy wallets. Following the rationale presented in the insightful article by Mahula et al. (2021), *HanHemen* is currently being designed through an action research-driven early-adopters online workshop scheduled for April 25, 2023 (https://preview.mailerlite.com/p7a2k6k8t0). This process involves co-production with end-users, offering each of them a blockchain-driven wallet to establish varying levels of data privacy (https://xd.adobe.com/view/9358fb5f-b8bf-4575-a69b-1c2044fe81b0-c60b/screen/a4020027-80ee-4cd7-8016-f647fa942bde/). As a result, *HanHemen* end-users may progressively become part of a blockchain-driven DAO. In the next methodological and comparative section, these cases will be included in the analysis (Table 1): DAOstack, Democracy Earth, and DeepDAO.

(iii) Data cooperatives are organizations that allow individuals to share their personal data for mutual benefit (Calzada, 2021b). For e-diasporas, data cooperatives could be used to collect and analyze data on their members to better understand their needs and provide more effective support. Additionally, data cooperatives could provide businesses with access to shared resources, such as marketing and sales data, customer databases, and other tools to improve their operations and reach new markets. The Calzada (2021b), Calzada (2020) and Bühler et al. (2023c) collected several case studies about data cooperatives that could be inspirational for e-diaspora development worldwide. To illustrate the potential of data co-operatives as a disruptive technology, several cases are listed below. Calzada (2021b), Calzada (2020) identified six active cases: (i) Salus, (ii) Driver Seat, (iii) My Data, (iv) LBRY, (v) DOrg.tech, and (vi) Polypoly. Bühler et al. (2023c) in a recent policy brief published by G20 identified ten transformative use cases of data co-operatives from Asia and Africa, with limited examples from Europe and the US: (i) M-Pesa (mobile money in Kenya), (ii) e-Kutir (digital agriculture in India), (iii) Farmerline (collaborative land management in Ghana), (iv) SOLshare (decentralized renewable energy in Bangladesh), (v) Nubank (Fintech for financial inclusion in Brazil), (vi) Halodoc (telemedicine in Indonesia), (vii) Zenzeleni (community networks in Africa), (viii) GemeinWerk (construction industry in Bavaria, Germany), (ix) Salus (healthcare in Barcelona, Catalonia), and (x) Driver's Seat (ride-hailing, USA). Salus.coop can illustrate the potential of data co-operatives as disruptive technologies by creating a framework for a citizen-driven collective health data management and governance model. In the next methodological and comparative section, the Datafund case will be included as well (see Table 1).

(iv) Virtual platforms within the metaverse can facilitate cultural preservation, educational initiatives, and entrepreneurial activities among diaspora members. The metaverse refers to a virtual space created by the convergence of physical and virtual worlds (Ning et al., 2021). The Metaverse resonates with the concept of context collapse (Calzada & Cobo, 2015). Context collapse is a phenomenon that occurs when different contexts in our lives, such as work, home, and social life, merge into a single context due to the use of digital technologies. Calzada and Cobo (2015) argued that context collapse is a key challenge for the development of smart cities, highlighting the need for new approaches to privacy, security, and data protection in the digital age. Alongside the analogy of context collapse in smart cities, e-Diasporas could use the Metaverse to connect with their communities in new ways, such as through virtual events and gatherings (Ball, 2022; Diminescu, 2012; Ning et al., 2021). To illustrate the potential of the Metaverse as a disruptive technology, eight functionalities are identified. Various platforms and technologies were explored by e-diaspora groups to create immersive virtual experiences that facilitate cultural exchange, community building, and cross-border connections. (i) One such avenue was Second Life and other virtual worlds, where e-diaspora communities established virtual spaces mirroring their cultural heritage. These digital environments allowed them to host cultural events, art exhibitions, and musical performances, bringing together diaspora members from around the world. (ii) Social media groups and online forums also played a crucial role, serving as hubs for discussions, news sharing, and cultural exchange. (iii) Furthermore, some e-diaspora communities ventured into the realm of virtual reality (VR) by organizing cultural gatherings in VR environments. They leveraged VR technology to immerse themselves in celebrations of traditional festivals and cultural exhibitions, transcending geographical boundaries. (iv) Language learning experiences in VR provided opportunities for members to practice native languages and engage in virtual language immersion. (v) Online gaming communities have

proven to be another avenue for e-diaspora engagement. Gamers from diverse backgrounds, including diaspora members, came together to form alliances, build camaraderie, and enjoy cultural exchange while playing multiplayer games. (vi) E-diaspora artists explored 3D virtual art galleries to showcase their creations in immersive environments, connecting with a global audience. (vii) Moreover, virtual reality storytelling and performances became a means for e-diaspora storytellers and artists to share their traditions with audiences worldwide. They transported viewers to immersive settings where traditional stories, music, and dance performances came to life. (viii) E-diaspora organizations, keen on preserving their cultural heritage, embarked on collaborative digital initiatives. They created virtual museums that displayed historical artifacts, photographs, and documents, offering a rich tapestry of their diaspora's history. While these cases exemplify how e-diaspora communities have been experimenting with digital platforms for cultural preservation and exchange, it is important to recognize that the Metaverse is a rapidly evolving concept. Thus, new opportunities and innovations continue to emerge, potentially reshaping the ways in which e-diaspora communities engage with virtual worlds and immersive technologies, further enhancing connectivity and cultural preservation on a global scale (Calzada & Arranz, 2022). In the upcoming methodological and comparative section, these cases will be included in the analysis (Table 1): Sandbox.game, Decentralized, and Second Life.

(v) ChatGPT is an AI language model that could be utilized by e-diasporas to overcome language barriers and facilitate communication. For example, it could provide language translation services for e-diaspora communities that are spread across multiple countries and speak different languages (Helberger & Diakopoulos, 2023). ChatGPT can be integrated into e-diaspora platforms to establish a real-time communication channel for community members to interact with each other. Additionally, ChatGPT can facilitate the rapid exchange of information between members, enhance group coordination and decision-making, and foster a sense of social belonging. Security is a vital aspect of the integration process, with necessary measures in place to ensure the user safety. In summary, ChatGPT can be envisioned as an e-diaspora tool offering various applications including chatbots, language translation, content creation, and personalized recommendations (Vaswani et al., 2017). To illustrate the potential of ChatGPT as a disruptive technology for e-diaspora communities, six ongoing functionalities are worth highlighting. ChatGPT, a powerful natural language processing model, has the capacity to revolutionize the ways in which e-diaspora members communicate, access information, and preserve their cultural identities. (i) Language Assistance and Learning: One notable application of ChatGPT within e-diaspora communities is its role in language assistance and learning. E-diaspora members often face the challenge of maintaining their native languages while residing in host countries. ChatGPT can serve as a virtual language tutor, offering language practice, translation, and cultural context. Users can engage in conversations with ChatGPT to improve language skills and foster cultural ties. (ii) Cultural Knowledge Sharing: ChatGPT can act as a repository of cultural knowledge. E-diaspora communities can develop customized chatbots that provide information about their cultural heritage, traditions, and history. These chatbots offer a conversational platform for sharing stories, anecdotes, and cultural insights with both community members and interested outsiders. (iii) Virtual Community Engagement: E-diaspora platforms and organizations have integrated ChatGPT into their websites and social media channels to enhance virtual community engagement. Chatbots powered by ChatGPT can answer questions, provide event updates, and offer help, ensuring that e-diaspora members feel connected and informed, even when physically dispersed. (iv) Preservation of Oral Histories: ChatGPT can assist in preserving oral histories within e-diaspora communities. By transcribing and archiving interviews with elders and community members, ChatGPT contributes to the documentation of cultural narratives and traditions that might otherwise be lost over time. (v) Digital Storytelling: E-diaspora authors and storytellers have harnessed ChatGPT to create interactive digital storytelling experiences. Users can engage in dialogues with AI-driven characters that embody cultural personas, providing a dynamic and immersive approach to preserving and sharing stories from their heritage. (vi) Customized Language Models: Some e-diaspora communities have developed their own customized language models based on ChatGPT. These models incorporate specific dialects, idioms, and cultural references unique to the community, allowing for more precise and culturally resonant interactions. These real cases demonstrate the transformative potential of ChatGPT in enabling e-diaspora communities to uphold their cultural identities, facilitate language learning, and foster connections within dispersed populations. As this technology continues to evolve, its role in preserving and strengthening e-diaspora cultures is expected to grow, offering innovative ways to bridge geographical and linguistic divides. In the upcoming methodological and comparative section, the Chatbot for Immigration Services Officer case will be included (Table 1).

In conclusion, disruptive technologies such as blockchain, DAOs, data cooperatives, the metaverse, and ChatGPT have the potential to significantly impact diaspora engagement globally. They can empower diaspora communities, facilitate secure transactions, foster collaboration, enable data-driven decision-making, and enhance virtual experiences. By leveraging these technologies, diaspora members can actively contribute to the development of their home countries and maintain strong connections with their cultural heritage and identity. However, the relationship of these emerging and disruptive technologies with the impact of HD remains to be explored in the next methodological and comparative section.

3. Methodology: Comparing Five Disruptive Technologies for e-Diasporas

As e-diasporas continue to grow, so do the opportunities and risks for disruptive technologies to shape and enhance these communities. As Stucke (2022) argues, the lack of data privacy and data extractivism in e-diaspora platforms could be exacerbated by the network effect, leading to harm (Arroyo et al., 2019; Bühler et al., 2023b). The network effect refers to the phenomenon where a platform becomes more valuable as more people use it (Katz & Shapiro, 1985). E-diaspora platforms can create new pathways for diaspora communities to connect and engage with each other while also potentially giving rise to new forms of data extraction and digital surveillance.

Table 1
Disruptive Technologies Hampering/Exacerbating HD.

				HD (Lack of Data Privacy/Driven by Data Extractivism)	
Disruptive Technologies	**Case Study**	**Link**	**Aim**	**Hampering Factors (+)**	**Exacerbating Factors (-)**
1.Blockchain (Al-Saqaf & Seidler, 2017; Atzori, 2017; Calzada, 2023a; Buterin, 2022; De Filippi et al., 2020; DuPont, 2017; Finck, 2018; Flore, 2018; Hughes et al., 2019; Inwood & Zappavigna, 2021; Kondova & Erbguth, 2020; Mahula et al., 2021; Naik & Jenkins, 2020; Rennie et al., 2022; Stanford DAO Workshops 2022 and 2023, 2023; Sullivan & Burger, 2017; Swan & De Filippi, 2017; Tapscott & Tapscott, 2016; Viano et al., 2023;Werbach, 2019;Woodall & Ringel, 2020;Zook, 2023)	***1.1. Somali Remittances***	https://publications.jrc.ec.europa.eu/repository/bitstream/JRC113484/how_blockchain_is_disrupting_migrants_remittances_online.pdf	To revolutionize the payments industry, speeding up processes and reducing transaction costs.	**Decentralized storage and data ownership:** Blockchain technology enables decentralized storage and data ownership, which could give diasporic citizens greater control over their data and reduce the risk of data extractivism. B4H advocates this idea (Zook, 2023). **Smart contracts and transparency:** Blockchain's smart contract functionality and transparency features could increase transparency and accountability in data exchange, potentially reducing the risk of data extractivism. Smart contracts, integral to blockchain technology, have the capacity to revolutionize transparency and accountability in data exchange. These self-executing contracts, automate processes without intermediaries once conditions are met, fostering trust. When applied to data transactions, they offer an auditable and immutable record of agreements and data access. This transparency not only bolsters accountability but also mitigates the risk of data extractivism, as users can clearly define and monitor data usage terms. By codifying data rights and ensuring compliance, smart contracts pave the way for a more equitable data ecosystem where data owners, users, and entities benefit from increased transparency and minimized data exploitation. **Cryptocurrency payments:** Blockchain-based platforms that use cryptocurrency for payments could offer increased anonymity and privacy for diasporic citizens, making it more difficult for data	**Lack of technical skills and understanding:** Blockchain technology can be complex and challenging to comprehend for some diasporic citizens who may not have a technical background. This could hinder their full utilization of the technology (Zook, 2023. **Limited access to reliable internet:** In certain parts of the world, internet access may be unreliable or limited. This could impede the adoption of blockchain-based e-diaspora platforms (Flore, 2018). **Regulatory and legal challenges:** The legal and regulatory framework for blockchain technology varies widely across different countries and regions. This variability could create adoption barriers for diasporic citizens dispersed across multiple jurisdictions, particularly concerning GDPR compliance. There are various blockchain cases beyond the mainstream Bitcoin and Ethereum (Buterin, 2022), such as Sovrin and Civic, which serve as digital identity platforms. However, blockchain does not offer an automatic solution to guarantee data sovereignty or protect diasporic citizens' data privacy (Hughes et al., 2019). As Mahula et al. concluded (2021), "although blockchain does contribute to achieving self-sovereign identity, it is not the silver bullet for it" (p. 495). **Technical limitations of blockchain:** While blockchain is renowned for its security and privacy features, it is not a panacea for all privacy
	1.2. B4H – Blockchain for Humanity	https://www.b4h.ngo/	To leverage blockchain technology for positive social impact.		
	1.3. Bitnation	www.bitnation.co	To provide decentralized governance and identity services for the diaspora community.		
	1.4. BABB	www.getbabb.com	To provide accessible banking services to underserved populations, including diaspora communities, through the use of digital identities and peer-to-peer networks.		
	1.5. Tari	www.tari.com	To enable creators and businesses to monetize their digital content and intellectual property, with the goal of empowering diaspora communities and other creatives.		
	1.6. AidCoin	www.crunchbase.com/organization/aidcoin	To increase transparency and accountability in charitable donations, with the goal of reducing fraud and improving efficiency in the distribution of aid to diaspora communities and other vulnerable populations.		
	1.7. World Identity Network	www.win.systems	To provide digital identity solutions to refugees and stateless persons, with the goal of enabling them to access essential services such as healthcare and education.		
	1.8. Humaniq	www.coinbase.com/price/humaniq	To provide financial services and identity solutions to unbanked and underbanked populations, including diaspora communities.		
	1.9. Golem Network	www.golem.network	To provide a decentralized supercomputer network for the diaspora community.		

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Table 1 (*continued*)

Disruptive Technologies	Case Study	Link	Aim	HD (Lack of Data Privacy/Driven by Data Extractivism)	
				Hampering Factors (+)	**Exacerbating Factors (-)**
				extractors to track their activities (Monsees, 2019).	concerns. There are still technical limitations of blockchain that could impede its effectiveness in protecting data privacy (Zook, 2023).
2. DAOs (DuPont, 2017; Hubbard, 2023; Mathew, 2016; Nabben, 2022; Spillescy et al., 2023;WEF, 2023; Zichichi, 2022)	***2.1. HanHemen***	www.hanhemen.eus/en/	To overcoming the gap between Basque e-diaspora members abroad and in the homeland.	**Decentralization:** DAOs are inherently decentralized, meaning they do not have a single point of control or authority. This could lead to increased autonomy and freedom for e-diaspora platform users, diasporic citizens, as decisions would be made collectively by the community, rather than by a central authority (Mathew, 2016; Spelliscy et al., 2023). **Transparency:** Transactions and decision-making processes in DAOs are recorded on a public blockchain, ensuring transparency and accountability. This could potentially enhance trust and openness among users of e-diaspora platforms, diasporic citizens (Hubbard, 2023). **Community governance:** DAOs empower their members to participate in the decision-making process, which could lead to a stronger sense of community and increased user engagement in e-diaspora platforms (Mannan & Pek, 2023).	**Legal and regulatory uncertainties:** DAOs are still a relatively new concept, and the legal and regulatory frameworks surrounding them are not yet fully developed. This could create uncertainties and potential risks for e-diaspora platforms that implement DAOs (WEF, 2023). **Scalability and efficiency issues:** Due to the decentralized nature of DAOs, decision-making processes can be slower and less efficient than those of centralized organizations. This could potentially hinder the growth and development of e-diaspora platforms. Additionally, there are tax uncertainties for both DAOs and the individuals who engage with them (Hubbard, 2023). **Security vulnerabilities:** DAOs operate on smart contracts, which can be vulnerable to hacks and exploits if not properly designed and audited. This could pose security risks for e-diaspora platforms and their users. Security vulnerabilities are a critical concern in the context of DAOs, primarily due to their reliance on smart contracts. While smart contracts offer transparency and automation, they are not immune to coding errors or vulnerabilities. Inadequate design or insufficient auditing can leave these contracts susceptible to hacking and
	2.2. DAOStack	https://daostack.io/	To provide the tools and infrastructure necessary for individuals and organizations to create, manage, and govern DAOs effectively.		
	2.3. Democracy Earth	www.democracy.earth	To provide a decentralized and transparent voting system for the diaspora community.		
	2.4. DeepDAO	www.deepdao.io	To provide data-driven insights, neutral, and objective information about DAOs, and help individuals make informed decisions regarding DAO participation.		

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Table 1 (*continued*)

Disruptive Technologies	Case Study	Link	Aim	HD (Lack of Data Privacy/Driven by Data Extractivism)	
				Hampering Factors (+)	**Exacerbating Factors (-)**
					exploits, potentially compromising the integrity of DAO operations. This vulnerability is particularly relevant to e-diaspora platforms, where user data and sensitive information are at stake. The security of these platforms and the trust of their users depend on rigorous code review, robust security measures, and proactive risk management to safeguard against potential threats and vulnerabilities (Nabben, 2022).
3. Data Cooperatives (Calzada, 2021b; Bauwens, Kostakis, & Pazaitis, 2019; Bühler et al., 2023b; Calzada, 2020; Mannan & Pek, 2023; Bühler et al., 2023c; Bühler et al., 2023a)	***3.1. Salus***	www.salus.coop	To foster a data-driven healthcare ecosystem where citizens have control over their health records and can contribute to advancements in health research while safeguarding their privacy and well-being.	**Data ownership and control:** Data cooperatives give members control over their data, allowing them to decide how their data is used and shared (Bauwens et al., 2019). They propose a framework for a digitally federated and sovereign architecture, providing a blueprint for achieving the Sustainable Development Goals (SDGs) (Bühler et al., 2023c). Data ownership and data sovereignty are at the core of data co-operatives (Calzada, 2021b; Hicks, 2022). **Privacy and security:** Data cooperatives often prioritize user privacy and security, employing advanced encryption methods to protect stored data. **Equitable distribution of benefits:** Members of a data co-operative can benefit from the value generated by their data, such as monetizing it through surveys and research opportunities (Mannan & Pek, 2023). **Trust and transparency:** Data cooperatives can foster trust between users and the platform, as members know that their data	**Regulatory compliance:** Data cooperatives need to comply with data protection regulations such as GDPR, which may require additional resources and expertise to ensure compliance. **Technical challenges:** Implementing a data co-operative model may involve complex technical infrastructure to support data storage, management, and sharing. **Limited data availability:** Since users have more control over their data, they may choose not to share it, potentially limiting the amount of data available for research or other purposes. **Evaluation and outcomes:** When using data cooperatives for research, it may be necessary to identify specific motivations, outcomes, and strategies to ensure the research achieves its objectives and can be properly evaluated (Bühler et al., 2023c). Salus.coop is a good example that has inspired the *HanHemen* e-diaspora platform (Calzada, 2023a).
	3.2. Driver's Seat	https://driversseat.co/	To use user's data to maximize rideshare and delivery earnings and take control of riders' wellbing.		
	3.3. MyData	https://mydata.org	To help people and organizations to benefit from personal data in a human-centric way.		
	3.4. LBRY	https://lbry.com	To create a decentralized and censorship-resistant marketplace for digital content, where content creators can publish their work and users can access content without intermediaries or centralized control.		
	3.5. DOrg.tech	https://www.dorg.tech	To facilitate the formation and operation of DAOs by offering smart contract templates, tools, and services that simplify the process of setting up and governing these decentralized entities.		
	3.6. PolyPoly	https://www.polypoly.org	To empower the purpose-driven vision of inventing a new economic system for data.		
	3.7. M-Pesa	https://www.youtube.com/watch?v=zQo4VoLyHe0	To provide accessible and convenient financial services to		

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Table 1 (*continued*)

				HD (Lack of Data Privacy/Driven by Data Extractivism)	
Disruptive Technologies	**Case Study**	**Link**	**Aim**	**Hampering Factors (+)**	**Exacerbating Factors (-)**
			individuals, especially those who may not have had access to traditional banking services.	is being managed ethically and transparently.	
	3.8. e-Kutir	https://e-kutir.gujarat.gov.in/	To empower smallholder farmers and rural entrepreneurs by providing them with access to technology-driven solutions and services that can improve their livelihoods and economic prospects.		
	3.9. Farmerline	https://farmerline.co	To empower farmers by equipping them with the tools, knowledge, and resources they need to improve their agricultural practices, increase their yields, and enhance their livelihoods.		
	3.10. SOLshare	https://solshare.com	To empower individuals and communities by enabling them to access clean and affordable solar energy and to create decentralized and sustainable energy-sharing networks.		
	3.11. Nubank	https://nubank.com.br	To provide accessible, transparent, and customer-centric financial services to individuals, particularly those who may be underserved or excluded from traditional banking systems.		
	3.12. Halodoc	https://halodoc.com	To improve access to healthcare, enhance healthcare delivery, and empower individuals to manage their health more effectively.		
	3.13. Zenzeleni	https://zenzeleni.net	To provide affordable and reliable internet and telecommunications services to underserved and remote rural communities.		
	3.14. GemeinWerk	https://gemeinwerk.eu	To empower communities, organizations, and individuals to create, manage, and govern their own decentralized entities and projects through the use of DAO technology.		

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				HD (Lack of Data Privacy/Driven by Data Extractivism)	
Disruptive Technologies	**Case Study**	**Link**	**Aim**	**Hampering Factors (+)**	**Exacerbating Factors (-)**
4. Metaverse (Ball, 2022; Ning et al., 2021)	***4.1. Sandbox. game***	https://sandbox.game/	To empower users to create, own, and monetize their gaming experiences and assets within a virtual metaverse.	**Connecting the world and negating physical distance:** The Metaverse can make geographic barriers irrelevant, allowing people from different locations to interact seamlessly. **Context Collapse:** The concept of "context collapse," as advocated by Author and Cobo in their 2015 article 'Unplugging: Deconstructing the Smart City,' refers to the phenomenon where digital spaces and technologies compress or blend various aspects of individuals' personal, social, and public lives, often erasing traditional boundaries between them. In the context of the Metaverse, this concept takes on new dimensions as immersive virtual environments further challenge the distinctions between physical reality and digital existence, potentially intensifying issues related to privacy, identity, and the coexistence of multiple contextual layers within a singular digital space. In summary, in the context of e-diasporas navigating the Metaverse, the notion of "context collapse" underscores the intricate challenge of reconciling the diverse facets of identity, community, and culture in a digital landscape that blurs the lines between the physical and virtual worlds. **Trust and Privacy:** Metaverse technologies can enhance trust and privacy for e-diaspora platforms by offering secure digital identities, controlled data sharing, and transparent governance. This can foster stronger, more secure online diaspora communities.	**Digital safety risks:** With digital risks already high, especially for vulnerable groups, safety risks could be more prevalent in the Metaverse, including unwanted contact and the rise of virtual currencies. **Trust and Privacy:** Privacy concerns in the Metaverse can hinder e-diaspora members from fully participating in virtual spaces. Striking the right balance between anonymity and identity verification is essential (Veliz, 2020). **Physical alienation through virtual addiction:** The Metaverse could be unsustainable, given the risk of individuals living in digital bubbles and becoming alienated from necessary human interaction (Newport, 2019).
	4.2. Decentraland	https://decentraland.org/	To create a decentralized virtual world for the diaspora community.		
	4.3. Second Life	https://secondlife.com/	To create a virtual world that allows the diaspora community to connect and interact with each other.		

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Table 1 (*continued*)

				HD (Lack of Data Privacy/Driven by Data Extractivism)	
Disruptive Technologies	**Case Study**	**Link**	**Aim**	**Hampering Factors (+)**	**Exacerbating Factors (-)**
				More effective and efficient testing and training: Teams can test ideas, train, and practice in the Metaverse with computer code, leading to more efficient and immersive experiences.	
5. ChatGPT (Vaswani et al., 2017; Helberger & Diakopoulos, 2023)	***5.1 Immigration Services*** ***5.2. ChatGPT***	https://hellotars.com/chatbot-templates/travel/H1mUrB/immigration-services-chatbot www.chat.openai.com	To help individuals with immigration-related queries and tasks. To gather user feedback and learn about its strengths and weaknesses.	**Enhanced conversational AI:** As a transformer-based language model, it offers advanced capabilities for building chatbots and conversational interfaces. **Content generation and curation:** It can generate high-quality and on-topic content. **Text classification and analysis:** It can be fine-tuned on labeled text data for tasks like sentiment analysis, topic grouping, and fake news detection.	**Data collection process used to train ChatGPT:** The collection is problematic because users are often not asked for permission to use their data, which can be considered a clear violation of privacy (Helberger & Diakopoulos, 2023). The paper by Helberger and Diakopoulos, titled "ChatGPT and the AI Act," discusses the implications of the European Union's AI Act on AI systems like ChatGPT. The authors examine the regulatory landscape for AI in the EU and its potential impact on the development and deployment of AI models, particularly those used for chatbots and conversational AI. They explore the challenges posed by the AI Act's proposed requirements, including data transparency, user control, and liability provisions, and discuss how these may influence the design and operation of ChatGPT and similar AI technologies. The paper offers insights into the evolving regulatory framework for AI in the EU and its potential consequences for AI developers and users. **ChatGPT might not be complying with GDPR standards:** This principle states that personal data must be lawfully, fairly, and transparently gathered and used in connection with the data subject.

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Table 1 (*continued*)

				HD (Lack of Data Privacy/Driven by Data Extractivism)	
Disruptive Technologies	**Case Study**	**Link**	**Aim**	**Hampering Factors (+)**	**Exacerbating Factors (-)**
					E-diaspora platforms should closely monitor the evolving regulatory landscape around AI and data use, taking cues from regulations like the AI Act to proactively address issues of transparency, user control, data ethics, and liability within their platforms. This will help them navigate potential regulatory changes effectively while maintaining the trust and security of their user communities. **ChatGPT can protect digital citizens by ensuring that users have control over their data privacy:** When using ChatGPT through third-party applications or services, users should check the privacy settings to ensure their data is not shared with third parties. If users are concerned about their data, it is recommended that they delete their ChatGPT conversations regularly. By being aware of privacy settings and taking appropriate actions, digital citizens can maintain better control over their data privacy while using ChatGPT.

In the literature review, the article introduced nine cases for blockchain, four cases for DAOs, 14 cases for data co-operatives, eight functionalities and three cases for the Metaverse, and six functionalities and two cases for ChatGPT. If we broaden our search to identify specific e-diaspora platforms worldwide, here are some active sites: (i) Remitly is a platform that enables people to send money across borders to their family and friends. (ii) We Are Sikhs is a platform that aims to raise awareness of the Sikh community in the United States and promote understanding of Sikh values. (iii) DiasporaEngager is a platform that connects members of various diaspora communities around the world, enabling them to find resources, opportunities, and collaborators. (iv) MyHeritage is a genealogy platform that enables users to build their family tree, connect with relatives around the world, and learn more about their heritage and ancestry. (v) WorldRemit is a platform that enables users to send money to family and friends across borders, with a focus on serving migrant communities. (vi) AIESEC is a global youth leadership platform that enables young people to gain professional and personal development experiences through international internships and volunteer opportunities. (vii) Latino Community Foundation is a platform that supports Latino-led non-profits and community organizations, enabling them to better serve and empower Latino communities around the world. (viii) JewishGen is a genealogy platform that focuses on Jewish ancestry, enabling users to connect with relatives and learn more about their Jewish heritage. (ix) Korean-American Community Foundation is a platform that supports Korean-American non-profits and community organizations, enabling them to better serve and empower Korean-American communities around the world.

Although none of the previous platforms seem to have integrated any disruptive technology yet, there are several emerging cases that have already started integrating one or more of the five disruptive technologies we refer to in this article (Table 1): (i) Blockchain for Humanity (B4H; https://www.b4h.ngo/) is a blockchain-based e-diaspora platform that aims to empower marginalized communities by providing them with access to blockchain technology and digital identity. (ii) DAOstack is a blockchain-based platform that enables decentralized decision-making and collaboration (https://daostack.io/). (iii) Datafund is a data cooperative that enables users to monetize their personal data while maintaining control over it (https://datafund.io/). (iv) The Sandbox is a Metaverse platform that allows users to create and share virtual worlds (https://www.sandbox.game/en/). (v) Chatbot for Immigration Services Officer offers an immigration services chatbot (https://hellotars.com/chatbot-templates/travel/H1mUrB/immigration-services-chatbot).

While these disruptive technologies have the potential to increase connectivity and collaboration among diaspora communities, they also pose challenges regarding data privacy and extraction (Renaud et al., 2014). By exploring the network effects of these technologies, this article aims to contribute to a more nuanced understanding of their impact on e-diaspora communities. To create an analytical and comparative table, the analysis has identified factors that both hamper and exacerbate the two impacts of HD: (i) the lack of data privacy (Calzada, 2022c; Stucke, 2022; Toscano, 2021; Veliz, 2020) and (ii) data extractivism (Arroyo et al., 2019; Sadowski, 2019). Several cases have been included in Table 1 to illustrate the relationship between each disruptive technology and e-diasporas.

Considering the integrated analysis conducted in Table 1, which blends the literature review (section two) with the empirical findings (this section) and the problem exposition (Section 1), measuring the impact of the five disruptive technologies on e-diaspora development requires a comprehensive assessment of their positive and negative contributions to e-diasporas as networks driven by human agency. It may be worth recalling both the objectives and the research question. The two objectives are (i) to review existing literature and subsequently provide a comparison of five disruptive technologies to assess their potential to sustain e-diasporas as networks driven by human agency and (ii) to explore their exposure to potential risks associated with digital downsides, including challenges related to institutional trust and data privacy stemming from HD as networks of data-driven activities. The research question is: How do these disruptive technologies affect e-diasporas (as networks of human-driven agency), either by hindering or exacerbating the impacts of HD (as networks of data-driven activities)? These empirical findings provide evidence of how these five disruptive technologies can be measured concerning their contribution to either hampering or exacerbating the impacts of HD, including the lack of data privacy for diasporic citizens (Veliz, 2020) and data extractivism (Sadowski, 2019). Table 2, presented at the end of this section, provides a summary of the comparison.

3.1. Blockchain

After conducting the literature review and presenting empirical findings of cases and functionalities (Table 1), the positive contributions of blockchain can be summarized as follows:

1. Financial inclusion: Blockchain-based solutions such as cryptocurrencies and digital wallets, can promote greater financial inclusion by enabling low-cost, cross-border payments and remittances (Chouliaraki & Georgiou, 2022; Flore, 2018; Naik & Jenkins, 2020; Zhang & Morris, 2023).
2. Transparent and secure transactions: Blockchain's distributed ledger technology provides a transparent and secure method for conducting transactions, fostering trust within e-diaspora communities (Werbach, 2019).
3. Decentralization: The decentralized nature of blockchain empowers e-diaspora communities to build peer-to-peer networks and circumvent traditional intermediaries, creating opportunities for collaboration and innovation (Inwood & Zappavigna, 2021; Zook, 2023).
4. Identity verification: Blockchain-based solutions can assist e-diaspora communities in establishing and verifying digital identities, protecting data privacy through the use of wallets (Calzada, 2023a). This is particularly valuable for individuals residing in regions with weak or unstable identity systems (Kondova & Erbguth, 2020).

However, there are also negative contributions to consider:

1. Energy consumption: The energy-intensive nature of blockchain can have adverse environmental effects, particularly in areas with limited access to renewable energy sources (Calzada, 2023c; Bridle, 2018).
2. Regulatory challenges: The decentralized nature of blockchain poses difficulties for regulation, giving rise to legal and regulatory challenges for e-diaspora communities (European Commission, 2020; Finck, 2018; UNESCO, 2023).
3. Lack of scalability: Current limitations in blockchain technology regarding scalability and speed may restrict its utility in certain contexts, especially when large-scale transactions or high-speed data processing are necessary (Hughes et al., 2019; Viano et al., 2023).
4. Security risks: While blockchain is generally considered secure, it is not impervious to security risks such as hacking and cyber-attacks, which can have negative repercussions for e-diaspora communities.

3.2. DAOs

DAOs are a relatively new phenomenon—DAOstack, DeepDAO, and Democracy Earth are among the cases presented in Table 1—but they have the potential to make a significant impact on e-diaspora development (Spillescy et al., 2023). Here are some ways in which DAOs can be measured in relation to their contribution to e-diaspora development, either hampering or exacerbating the impacts of HD:

DAOs can contribute positively as follows:

1. Democratization of decision-making: DAOs enable e-diaspora communities to make collective decisions in a decentralized and democratic manner, can empowering diasporic citizens and increasing their engagement and investment in e-diaspora projects (Hubbard, 2023).
2. Transparency: DAOs operate on a transparent, public ledger, which can enhance trust and accountability within e-diaspora communities (DuPont, 2017).
3. Incentivization: DAOs provide incentives for community members to contribute their time, skills, and resources to e-diaspora projects, driving innovation and accelerating development (WEF, 2023).
4. Community-driven development: DAOs are typically driven by community members with shared goals and values, leading to the development of solutions tailored to the specific needs and challenges of e-diaspora communities (Zichichi et al., 2022).

In contrast, negative contributions can also be identified:

1. Regulatory challenges: The decentralized nature of DAOs can create legal and regulatory challenges, particularly in countries where cryptocurrency and blockchain are not yet fully regulated (WEF, 2023).
2. Technical complexity: DAOs can be technically complex and require significant technical knowledge to set up and maintain, limiting their accessibility to e-diaspora communities with limited technical expertise (Spelliscy et al., 2023).
3. Risk of exploitation: DAOs can be vulnerable to exploitation and manipulation by bad actors, posing a risk to the security and stability of e-diaspora projects (Mathew, 2016).
4. Lack of accountability: While DAOs operate on a transparent, public ledger, challenges may arise in holding community members accountable for their actions and decisions (Toscano, 2021).

Table 2
Comparing Disruptive Technologies for e-Diaspora as Enablers or Inhibitors.

DISRUPTIVE TECHNOLOGIES					
	1. **Blockchain**	2. **DAOs**	3. **Data Cooperatives**	4. **Metaverse**	5. **ChatGPT**
e-Diaspora Enablers (Overcoming HD Impacts) +	1. Financial inclusion 2. Transparent transactions 3. Decentralization 4. Identity verification	1. Democratization of decision-making 2. Transparency 3. Incentivization 4. Community-driven development	1. Data sovereignty 2. Data sharing 3. Privacy protection 4. Collective bargaining	1. Inclusive virtual communities 2. Cross-cultural exchange 3. Access to services and resources 4. Economic opportunities	1. Accessibility 2. Knowledge sharing 3. Multilingual support 4. Time and cost savings
e-Diaspora Inhibitors (Exacerbating HD Impacts) -	1. Energy consumption 2. Regulatory challenges 3. Lack of scalability 4. Security risks	1. Regulatory challenges 2. Technical complexity 3. Risk of exploitation 4. Lack of accountability	1. Technical complexity 2. Legal and regulatory challenges 3. Risk of exploitation 4. Data quality issues	1. Digital/Data divide 2. Virtual addiction 3. Loss of physical connection (sociophobia?) 4. Security and privacy concerns	1. Technical Limitations 2. Problematic data collection 3. Privacy concerns 4. Dependence on technology 5. Communication barriers

3.3. Data Cooperatives

Data cooperatives are a type of cooperative that allows individuals to share and control their data collectively (Bühler et al., 2023c). Positive contributions of data cooperatives in addressing the limits of HD can be listed as follows:

1. Data sovereignty: Data cooperatives empower e-diaspora communities to take control of their data and leverage it for their benefit, increasing their economic and social capital (Calzada, 2021b).
2. Data sharing: Data cooperatives enable e-diaspora communities to collaboratively and securely share data, facilitating the development of new products and services tailored to the community's specific needs (Bühler et al., 2023a).
3. Privacy protection: Data cooperatives provide e-diaspora communities with greater privacy protection by allowing them to control how their data is collected, used, and shared (Calzada, 2022c).
4. Collective bargaining: Data cooperatives, as a subcategory of platform cooperatives (Calzada, 2020), enable e-diaspora communities to negotiate better terms with data buyers and sellers, increasing the value of their data and ensuring a fair share of the benefits (Mannan & Pek, 2023).

Regarding negative contributions of this disruptive technology:

1. Technical complexity: Data cooperatives can be technically complex and require significant technical expertise to set up and maintain, limiting accessibility for e-diaspora communities with limited technical knowledge (Orgad & Bauböck, 2018).
2. Legal and regulatory challenges: The legal and regulatory frameworks governing data collection, use, and sharing can be complex and vary across jurisdictions, creating challenges for data cooperatives operating in e-diaspora contexts (TAPP, 2023).
3. Risk of exploitation: Data cooperatives can be vulnerable to exploitation and manipulation by bad actors, posing a risk to the security and privacy of e-diaspora communities (Cheney-Lippold, 2016).
4. Data quality issues: Data cooperatives rely on the quality and accuracy of the data shared by community members, which can vary and create challenges for data analysis and utilization (Loukissas, 2019).

3.4. Metaverse

Metaverse is an emerging technology that refers to a collective virtual shared space created by the convergence of virtual reality, augmented reality, and other immersive technologies (Ball, 2022).

In terms of positive contributions:

1. Inclusive virtual communities: The Metaverse can foster inclusive virtual communities where e-diaspora members can interact with each other regardless of their geographic location or physical abilities, fostering a sense of belonging and potentially establishing a digital citizenship regime called "citizenship by connection" (Calzada, 2023c; Sullivan and Burger, 2017).
2. Cross-cultural exchange: The Metaverse facilitates cross-cultural exchange among e-diaspora communities, allowing members to share their cultural heritage, traditions, and experiences in a virtual environment (Calzada & Arranz, 2022).
3. Access to services and resources: The Metaverse can provide e-diaspora communities with access to services and resources that may not be available in their physical location, such as healthcare, education, and entertainment (Ning et al., 2021).
4. Economic opportunities: The Metaverse creates economic opportunities for e-diaspora communities through virtual entrepreneurship, digital content creation, and the sale of virtual goods and services (Ratto & Boler, 2014).

On the other hand, potential negative contributions of the Metaverse include:

1. Digital and data divide: The Metaverse may widen the digital and data divide between e-diaspora communities that have access to advanced technological infrastructure and those that do not, leading to unequal opportunities and outcomes (Calzada & Cobo, 2015).
2. Virtual addiction: The Metaverse may contribute to addictive behaviors and dependencies that could negatively impact the mental health and well-being of e-diaspora members (Lanier, 2023).
3. Loss of physical connection/physical alienation/Context collapse: The Metaverse may result in a loss of physical connection and personal relationships among e-diaspora members, limiting the richness and complexity of human interaction (Newport, 2019).
4. Security and privacy concerns: The Metaverse may raise security and privacy concerns related to the storage and use of personal data, as well as the potential for exploitation and manipulation by malicious actors (Riordan, 2019).

3.5. ChatGPT

As an AI language model, ChatGPT is a tool that e-diaspora communities can utilize to facilitate communication, knowledge exchange, and collaboration. Here are some ways to evaluate ChatGPT's contribution to e-diaspora development as networks driven by human agency (Brown, 2020), both positively and negatively:

Regarding positive contributions:

1. Accessibility: ChatGPT is an accessible tool that can be used by e-diaspora communities with varying levels of technical expertise and language abilities (Helberger & Diakopoulos, 2023).
2. Knowledge sharing: It facilitates the sharing and transfer of knowledge among e-diaspora communities by providing a platform for members to ask and answer questions, share insights and experiences, and collaborate on projects (HanHemen, 2023).
3. Multilingual support: ChatGPT supports multiple languages, helping to overcome language barriers and enabling communication and collaboration among e-diaspora communities that speak different languages (Brown, 2020).
4. Time and cost savings: It can save time and costs associated with traditional communication methods such as phone calls, emails, and in-person meetings (Couldry & Mejias, 2019).

On the other hand, there are potential negative contributions to consider:

1. Technical limitations: ChatGPT is limited by its programming and training, which may not capture all the nuances of language and cultural context, potentially leading to algorithmic bias or inaccurate responses (Birhane, 2021).
2. Problematic data collection: Concerns may arise regarding the usage of users' data without proper permission or consent (Madison, 2020).
3. Privacy concerns: ChatGPT may raise privacy concerns related to the storage and use of user data, particularly in jurisdictions with weaker data protection regulations (Veliz, 2020).
4. Dependence on technology: It may foster a reliance on technology and limit face-to-face interaction and personal connections among e-diaspora communities (Calzada & Cobo, 2015).
5. Communication barriers: ChatGPT may not effectively address communication barriers related to language and cultural context that cannot be fully captured through text-based communication (Ong, 1999).

4. Discussion and Final Remarks

This article discusses the risks of HD and the opportunities associated with e-diaspora platforms in relation to five disruptive technologies: Blockchain, DAOs, data cooperatives, Metaverse, and ChatGPT. By comparing these technologies, the article aimed to address the research question: How do these disruptive technologies affect e-diasporas (as networks of human-driven agency), either hindering or exacerbating the impacts of HD (as networks of data-driven activities)?

The article has responded to this research question through an integrated content and structure, which includes:

Section one: The problem exposition, presenting the main hypothesis, two objectives, and formulating the research question.

Section two: A literature review that introduces nine blockchain cases, four DAOs cases, 15 data co-operative cases, eight and three Metaverse cases and functionalities, respectively, and finally, six and two ChatGPT cases and functionalities, respectively.

Section three: A methodological section culminating in Tables 1 and 2, which compare the five disruptive technologies to determine whether they positively (enablers) or negatively (inhibitors) affect e-diasporas concerning data privacy (Veliz, 2020) and extractivism (Sadowski, 2019) by addressing or exacerbating HD impacts.

The main hypothesis of this article clarifies that HD impacts depend not only on how dominant players in the Big Tech industry configure their technological and institutional settings but also on how multistakeholder policy frameworks at the regional level operate and self-regulate their data-driven economies and societies. The Barcelona case, in particular, and the CCDR, in general, are two remarkable sources of information worth exploring by readers interested in advancing emancipatory datafication strategies for achieving data sustainability (Calzada, 2021c, 2023c; Calzada et al., 2021). The article concludes that e-diaspora platforms may adopt some or all of the examined disruptive technologies, not necessarily in any predetermined order or manner. Through the literature review and comparison, it is observed that several disruptive technologies are interconnected in their implementation and rely on multistakeholder compositions to foster e-diasporas as networks driven by human agency (Calzada, 2021c), a trend that may continue in the evolution of digital futures for e-diaspora platforms.

Web2 enabled the harms perpetrated by centralized Big Tech companies (Srivastava, 2021; Toscano, 2021). Some disruptive technologies can exacerbate or mitigate these harms on e-diaspora platforms. Blockchain, DAOs, and data cooperatives could usher in a new era of transparency, equitable ownership, and governance, while the Metaverse and ChatGPT may worsen the consequences of extractive and harmful datafication through HD. E-diasporas stand at a crossroads, relying on these disruptive technologies, which could, on the one hand, empower the public to reclaim the digital public sphere and mitigate harms in the online economy, and on the other hand, undermine digital democracy in the absence of effective antitrust laws (TAPP, 2023).

To illustrate this integrated response to the research question, while keeping the hypothesis in mind, Table 3 depicts the potential preconditions for the adoption of these disruptive technologies. It provides a general overview of the pros and cons of each disruptive technology. The applicability and effectiveness of each disruptive technology may vary depending on the specific needs and characteristics of the e-diaspora community and platforms with particular multistakeholder compositions (Calzada & Cowie, 2017).

The analysis presented in this article has been tested through ongoing action research on an e-diaspora platform called *HanHemen,* led by the Basque Government (HanHemen, 2023; Calzada, 2023a). It has also been presented at Stanford University, The Science of Blockchain Conference 2023 (SBC'23; https://cbr.stanford.edu/sbc23/) and the 2023 Stanford DAO Workshop (https://daoworkshop.notion.site/2023-Stanford-DAO-Workshop-ffdcc1e7ff7749a6afc1ee7b7bdc134c). Based on the comparative examination conducted in Tables 1 and 2, this article presents its final remarks in Table 3, in response to the research question mentioned above. These findings are presented as a way to generalize them, following a digital anthropology approach (Boellstorff, 2012; UNESCO, 2023). Consequently, these findings should be thoroughly considered when applied to specific multistakeholder compositions and policy

frameworks, as suggested by the main hypothesis of this article.

First, although blockchain implementations are still in their early stages (De Filippi et al., 2020), there is an increasing proliferation of e-diaspora platforms that partially rely on blockchain-driven architectures (HanHemen, 2023). However, technical, scalability, and regulatory hindrances seem to undermine their potential to address the impacts of HD (Zook, 2023). The promises and perils of blockchain implementations may shape the Web3 movement. However, blockchain is not an automatic blueprint for guaranteeing data sovereignty or protecting diasporic citizens' data privacy (Hughes et al., 2019). At this stage, blockchain appears to be in the early phases of developing a decentralized e-diasporic architecture. Failing to achieve this through multistakeholder policy frameworks may mean that e-diasporas, as networks driven by human agency, still rely on dominant ownership by data-opolies fueling HD (Stucke, 2022).

Second, DAOs, stemming from blockchain, provide a governance model for diasporic citizens to build transparent and democratic organizations. Nevertheless, DAOs may need to transcend the fiduciary scheme and focus on social capital (WEF, 2023). In addition to technical complexities, the lack of community engagement, brittle regulations, and the hyper-individualistic crypto and libertarian culture seem to be the three main obstacles for DAO adoptions as e-diaspora platforms (Nabben, 2022). Another interesting observation is the way in which the Stanford DAO community has embraced the co-operative ethos as a means to address DAO's governance hindrances.

Third, data cooperatives (Calzada, 2021b; Bühler et al., 2023c), as a response to the lack of DAO engagement, could be seen as a disruptive technology that addresses challenges within e-diaspora communities if data misuse does not jeopardize their feasibility. The limited regulatory framework is being intelligently challenged in Europe through the promotion of data donation and altruism (European Commission, 2020). Co-operatives, as such, are not straight-forward organizational forms in terms of complex data sharing, reward systems, and decision-making processes. Thus, data co-operatives, as a disruptive and emerging technology, need to find their own space in the Web3 ecosystem by acknowledging their successful legacy in proposing an alternative view to surveillance capitalism (Berners-Lee et al., 2001; Grabher & König, 2020; Polanyi, 1944; Schumpeter, 1942; Zuboff, 2019).

Fourth, the implementation of the Metaverse (Ball, 2022) faces barriers, and its current intrusive design exacerbates the impacts of HD. The Metaverse presents a multifaceted challenge for e-diaspora platforms in terms of data privacy and extractivism. Two main final remarks are: (i) The immersive nature of the Metaverse blurs the boundaries between physical and virtual realms, making it challenging to protect users' personal data. E-diaspora members engaging in virtual communities may unwittingly expose sensitive information, raising concerns about surveillance and unauthorized data collection (Veliz, 2020). (ii) The Metaverse's data-rich environment can be fertile ground for data extractivism (Sadowski, 2019). Corporations and entities operating within the Metaverse may exploit users' interactions, behaviors, and preferences for profit without adequate consent or compensation. E-diaspora platforms risk becoming conduits for data extraction, potentially leading to the exploitation of their members' personal and cultural data. Addressing these challenges requires stringent data protection measures, robust privacy policies, and user education within e-diaspora platforms. Without proactive safeguards, the negative impact of the Metaverse on data privacy and extractivism may jeopardize the trust and security of these virtual communities.

Fifth, ChatGPT (Brown et al., 2020) can be regarded as the most significant digital disruption currently affecting the understanding of e-diaspora platforms and the way they have operated thus far, enabling interaction among peer diasporic citizens and their homelands. It remains to be seen whether ChatGPT can resolve its data collection issues to become a game-changer for e-diaspora platforms worldwide. These platforms have traditionally relied on conventional means of communication and interaction among diasporic citizens and their home countries. The introduction of ChatGPT, with its advanced natural language processing capabilities, promises to revolutionize this landscape by enabling more seamless and intuitive interactions. The potential of ChatGPT within e-diaspora platforms lies in its ability to facilitate cross-cultural communication, preserve linguistic heritage, and bridge geographical divides. Its capacity to understand and respond in multiple languages fosters a sense of connectedness among diaspora members and their homelands, transcending traditional communication barriers. However, it is important to acknowledge the challenges associated with data collection and privacy that ChatGPT and similar AI models raise. To become a true game-changer for e-diaspora platforms worldwide, ChatGPT must address these issues effectively. Ensuring that data collection respects user privacy, cultural sensitivity, and ethical considerations will be paramount to avoid falling into the trap of invasive HD data-opolitic trends (Stucke, 2022). In conclusion, ChatGPT's potential to reshape the landscape of e-diaspora platforms is significant. Yet, its success in this endeavor hinges on its ability to navigate the complexities of data collection while preserving the essence of cultural exchanges and interactions that are at the heart of these platforms.

Although the objectives of this article were (i) to review existing literature and provide a comparison of five disruptive technologies and (ii) to explore their exposure to potential risks associated with data privacy (Veliz, 2020) and extractivism (Sadowski, 2019), the cases and functionalities presented only serve to illustrate the emerging potential of these technologies and their current impact on e-diasporas as networks driven by human agency. It is important to note that the article did not attempt to provide exhaustive coverage of these complex disruptive technologies. Instead, it acknowledges its limitations as a modest attempt to approach these evolving trends. Consequently, future research is needed to further expand upon this preliminary attempt to map out and compare these five disruptive technologies. They may eventually establish themselves as digital futures, transforming the understanding and implementation of e-diaspora platforms.

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Table 3
Responding to the Research Question.

Disruptive Technologies	Pros	Cons
1. **Blockchain**	• Decentralized, secure, transparent, and immutable, which can increase trust among diaspora communities (Mathew, 2016). • Enables smart contracts, which can automate transactions and reduce costs (Flore, 2018).	• Requires significant technical expertise to implement and maintain (Mahula et al., 2021). • Can be slow and expensive to use, especially for small transactions (HanHemen, 2023). • Limited adoption and regulatory uncertainty may make it challenging to integrate with traditional financial systems (Hughes et al., 2019).
2. **DAOs**	• Enables diaspora communities to collectively govern and make decisions about shared resources, such as funds or projects (Spelliscy et al., 2023). • Provides transparency and decentralization, which can increase trust and participation (Zook, 2023). • Has potential for social impact and community development (WEF, 2023).	• Requires significant community engagement and buy-in to establish and maintain (DuPont, 2017). • Limited legal frameworks and regulatory uncertainty may make it challenging to operate (Hubbard, 2023). • Potential for governance issues and conflicts within the community (Gorwa, 2019).
3. **Data Cooperatives**	• Enables diaspora communities to collectively own and control their data, which can increase privacy and data security (Calzada, 2020). • Provides potential for monetizing data and sharing in profits (Bühler et al., 2023c)). • Can facilitate data sharing and collaboration among community members.	• Requires significant community engagement and trust to establish and maintain (Pierson, 2021). • May be limited by regulatory frameworks and data protection laws (European Commission, 2020). • Potential for exploitation and misuse of data if not managed properly (Grabher & König, 2020).
4. **Metaverse**	• Provides an immersive virtual environment where diaspora communities can interact and engage with each other, regardless of physical distance (Calzada & Cobo, 2015). • Can enhance social connections and cultural preservation (Calzada & Arranz, 2022). • Has potential for e-commerce and other economic opportunities (Katz & Shapiro, 1985).	• Requires high-end hardware and internet access, which may exclude some members of diaspora communities (Ball, 2022). • Concerns about privacy and security in virtual environments (Veliz, 2020). • Potential for addiction and loss of real-world connections (Lanier, 2023).
5. **ChatGPT**	• Can provide personalized and responsive communication with diaspora communities, which can increase engagement and trust (Kannisto, 2016). • Enables 24/7 availability and multilingual support (Cook, 2022). • Can be integrated with other technologies such as chatbots and AI translation (Helberger & Diakopoulos, 2023).	• Massive challenges associated with data collection and privacy that ChatGPT and similar models raise (Brown et al., 2020). • May not be able to handle complex queries or conversations (Marquardt, 2021). • Requires ongoing maintenance and training to ensure quality and accuracy (Bridle, 2018). • Limited human touch may decrease personal connection and trust (Newport, 2019).

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Data will be made available on request.

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discussions about this topic with policymakers, academics, and members of the Basque diaspora. Eskerrak eman nahiko nizkioke, Gorka Alvarez Aramburu-ri (Eusko Jaurlaritzako, Kanpoan den Euskal Komunitatearentzako Zuzendaria), ikerketa-ekintzaren bidez, entzute-aktiboarekin, auzolan-lankidetzan diaspora berriaren inguruan / nomadismo digitala aurreikusiz, irekitzen ari garen ikerketa-ekintza roadmap digitalarengatik.

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