Digital Nations and the Future of the Climate Crisis

ALFONSO HEGDE
University of Southern California, USA

This article discusses sociotechnical change through the case of Tuvalu's Future Now project, a set of initiatives Tuvalu is implementing to digitize their lands and traditions into the metaverse to preserve Tuvaluan culture amid impending climate destruction. In this article, I examine potential challenges Tuvalu faces in navigating this digital future given the social reality of the technology platforms and people Tuvalu would encounter during the transition process in making their digital dreams a reality. I detail challenges related to surveillance, sovereignty, and empathy intended to inform the country of Tuvalu on negotiating with these powerful entities as they embark into uncharted (digital) waters.

Keywords: metaverse, sociotechnical change, digital sovereignty, surveillance capitalism, digital archives, racial empathy, virtual reality, blockchain, DAOs

If you spend any time on the livestreaming website Twitch, you have encountered the .tv website extension. This Internet country code is the most notable cultural export of the small island nation Tuvalu, which is now on the cusp of another Internet policy decision that may further entrench its relationship with global technology companies and the digital ecosystem: digitizing its lands and culture into the metaverse.

Tuvalu is an island country in the South Pacific with rich Polynesian cultural traditions including *olaga fakafenua* (communal living systems), *kaitasi* (shared responsibility), and *fale-pili* (being a good neighbor; Department of Foreign Affairs, Government of Tuvalu, 2022, para. 1). Tuvalu is comprised of nine small islands in the South Pacific all connected through a shared Polynesian culture and parliamentary democracy (Macdonald, n.d.). This set of traditions and physical lands are at risk of ceasing to exist in the physical world due to the ever-increasing threat that is the climate crisis. Islets within the nation are currently poised to sink within the coming decades.

In a harrowing speech at the United Nations Climate Change Conference (COP27) on November 9, 2022, foreign services minister Simon Kofe proposed a new approach to handling climate change by digitizing the entirety of Tuvalu's culture into online archives and a multidimensional virtual space within the metaverse as a means of maintaining a sense of sovereignty and cultural preservation amid climate-related destruction in the physical world (Kofe, 2022). Environmental destruction begets a new frontier of sociotechnical change, complicating questions of privacy, citizenship, and humanity within an uncharted digital future.

Kofe's speech and the subsequent Future Now project (a series of initiatives around digitization proposed by the Tuvaluan government), three key objectives emerge: (1) a desire to archive lands and people for when they may no longer exist physically, (2) an affirmation of sovereignty both physically and virtually amid an uncertain future of present-day land and water borders, and (3) a call to action using virtual empathy (Nakamura, 2020) to inspire climate action today to prevent this dystopic future.

Through this set of initiatives, I identify three key concepts as seen through the lens of sociotechnical change that may pose challenges for navigating this uncharted territory:

- **Archival Surveillance**—digital archives made for preservation but having the unintended consequence of implicit online surveillance and data collection
- **Digital Sovereignty—**complex system of navigating nationhood within digital spaces and their underlying physical infrastructure
- **Virtual Empathy—**notion of empathy in a virtual space, especially as it relates to Western sensibilities attempting to empathize with people of foreign nations

Archival Surveillance

Initiative 3 of Tuvalu's Future Now project involves creating "digital archives of Tuvalu's history and cultural practices to create a digital nation" (Department of Foreign Affairs, Government of Tuvalu, 2022, para. 4). This digitization effort would most likely involve implicit participation in what Shoshanna Zuboff (2015) calls surveillance capitalism, which she defines as the "new form of information capitalism [that] aims to predict and modify human behavior as a means to produce revenue and market control" (p. 1). The nature of the data-centered business model of modern-day technology giants is that personal data is the new resource of the 21st century. This surveillance-based monitoring system remains a central driver of economic control, potentially amplified within the metaverse (Zuboff, 2018). The company Meta already collects user data for Meta Quest headset apps logged into via a Facebook account, a login option made easy and interoperable among different metaverse games and apps.

Tuvalu should maintain healthy skepticism around an aspirational digital archive future. This technofuturist vision of an open and connected digital archive is not necessarily purported by technology companies purely for altruistic purposes but often "inextricably tied to settler-colonial ideology and the extraction of value as a core impetus" (Hogan, 2023, p. 21). Tuvalu's Future Now project faces this particular challenge of how to navigate their digitization effort given the track record of technology companies they may have to depend on who will likely host their digital data with the extractive-surveillance business model built into its very core. As with "the rise of consumer-directed DNA kits that solicit individuals DNA to then be uploaded 'to the cloud' and into massive proprietary commercial databases" (Hogan, 2023, p. 16), efforts to utilize cloud-based storage technology often comes with implicitly signing off personal data rights to host companies and third parties they sell data to. What is already happening with consumer DNA data could easily find its way transitioning into national digitization and archival efforts such as those of Tuvalu, with the data of a sovereign nation and its citizens at the mercy of large private entities to buy and sell at their discretion. But how would Tuvalu go about handling this digital transition in a way that ensured the sovereignty that the country desires?

Digital Sovereignty

To become the world's first truly digital nation, including plans to "create a digital Government administrative system" (Department of Foreign Affairs, Government of Tuvalu, 2022, para. 4), Tuvalu needs to navigate challenges around what sovereignty and nationhood would look like in the metaverse from both a software and hardware perspective.

From a software and hosting perspective, there are effectively two orientations toward the metaverse and how data is stored within it that are worth examining: private and public. "One is a privatized, centralized future where big corporates, such as Facebook's 'Meta,' determine how people 'socialize, learn, collaborate and play'" (Nabben, 2021, p. 1). This model generally necessitates "value [being] extracted from users as consumers" (Nabben, 2021, p. 2). If Tuvalu is committed to ensuring a sense of sovereignty for its digital-national future, the Future Now project needs to also advocate for a second model for the metaverse imaginary: the public metaverse model. In the public model, "numerous, decentralized digital worlds that people can move between . . . are built and owned by participants" specifically through "'decentralized autonomous organizations' (or DAOs) where distributed, objective-aligned communities collectively own, govern and work in digital worlds" (Nabben, 2021, p. 2). In this version of the metaverse future, Tuvaluans would still be able to retain democratic control over their own virtual world, which would enable the meaningful preservation of cultural values in this forthcoming digital space without external data extraction and governing dependence.

This public metaverse model with decentralized autonomous organizations determining online governance comes with a few specific challenges in navigating the blockchain foundation it sits upon. Today, DAOs operate under the following voting structure:

> [Voting happens] usually among anonymous accounts, or wallets; their governance is typically plutocratic (one coin—one vote; or one coin—square-root vote, as in quadratic voting); it is executed by anonymous third parties—miners that require remuneration (gas); and it is executed on a predetermined platform and protocol. (Shapiro & Talmon, 2022, p. 3)

Even within the seemingly ideal scenario of having a democratic model, ownership of tangible tokens still determines ownership over the space, a less-than-ideal outcome for native Tuvaluans who might want a personal stake in their country's digital future but may not have the financial means to compete with blockchain miners on a global scale. Shapiro and Talmon (2022) offer the following explanation of democratic DAOs:

> In contrast, a democratic DAO is among digitally identified individuals; its intended governance is democratic; it is executed by its participants; it is amenable to encompassing constitutional governance, as every aspect of the digital social contract, including the underlying protocol of execution as well as the democratic decision process itself, may be subject to democratic amendment. (p. 3)

This democratic model, restricted to Tuvaluans and their current governmental structure, would be the ideal approach to ensuring meaningful digital sovereignty.

Consider in addition to the choice of virtual governance, the question of storage: "Amazon's market share in the worldwide cloud infrastructure market amounted to 34% in the third quarter of 2022" with Microsoft Azure and Google Cloud lingering not far behind (Richter, 2023, para. 1). Tuvalu has been crystal clear about its desire to maintain its land and maritime borders as they currently stand, but without the physical hardware to store their archives and virtual world, Tuvalu will likely be dependent on the private hosting services of Amazon or some other equivalent cloud-based service on the backend. Tuvalu's digital nation will operate on the rental space of Amazon Web Services, and the maintenance of their community will be entirely at the behest of a large private company within another sovereign nation. As Bruno Latour argues, "physical artefacts are deliberately designed to shape and constrain human behavior," with "physical elements [being integral] to the analysis of sociotechnical artefacts" (Nabben, 2021, p. 2); digital nationhood is no exception, as the physical hardware upon which the digital structure rests is integral to the way that system is owned and operated.

If Tuvalu wants to circumvent the reliance upon a private entity such as Amazon, it might opt for a decentralized approach based on a peer-to-peer blockchain system. In the case of a blockchain future, individual coin holders would operate server nodes, wherein the hosting services would not be entirely at the mercy of one company. Instead, each node, or separated piece of server hardware, would host a small piece of the digital database. This could prevent one company from having the sole power to turn everything off. But at the same time, hosting challenges still arise in terms of ownership, wherein a blockchain network is still owned and operated by the owners of the coin, in a plutocratic manner as stated above, not necessarily by Tuvalu's government and citizens. How would sovereignty work in a decentralized future where physical hardware is separated into a variety of hosts around the globe within other sovereign nations or multinational companies?

There are some efforts globally to retain more control over backend data by advocating for and maintaining local physical infrastructure, including in Latin America and India (Pinto, 2018, p. 21). In these cases, there is a potential issue in convincing the target metaverse participants of the value of maintaining ownership over the physical infrastructure: efficiency. If opting out of "either proprietary or dominant choices" for hosting, Tuvalu may face the "growing challenges to meet user expectations, in terms of both speed of delivery and quality of the user experience. Sustainability is also among the challenges, as in reaching mass adoption" (Pinto, 2018, p. 21). Unlike simple website hosting services, Tuvalu will have to depend on the explosive data required to build out an entire virtual world. The question remains: Is the principle of maintaining digital sovereignty worth having to deal with potential slowness and inefficiency? There is also an open question, given the lack of physical infrastructure as in lands gradually sinking due to rising sea levels, of where the actual hardware would tangibly reside and under whose jurisdiction.

Virtual Empathy

In contending with some of these challenges around surveillance and sovereignty, Tuvalu must also answer one important question: Who is this space being built for? The COP27 announcement is clear that one purpose of the digitizing effort is to "provide solace to our people and remind our children and grandchildren what our home once was" (Kofe, 2022, 01:20) speaking to Tuvaluans in the near future to engage with and remember their physical lands. Kofe also attempts to connect to global audiences stating that "our action alone cannot stop the current trajectory of climate change. Only a concerted global effort can ensure that Tuvalu does not move permanently online and does not disappear entirely from the physical plane" (Kofe, 2022, 02:25). This COP27 speech intends to motivate global climate activists and concerned netizens, or Internet users, to speak up and fight back against climate change to prevent this type of dystopic future from materializing.

Perhaps the sociopolitical motivations for Tuvalu to virtualize its natural environments as a means of activating global sustainability efforts could be explained by the possibility that "immersion in virtual worlds [provides] unprecedented ways to interact with aspects of biodiversity that would otherwise be difficult to reach" to "help people better understand consequences of climate change . . . leading to adjustments in behavior" (Rillig et al., 2022, pp. 4721–4722). Tuvalu is using these virtual worlds as an empathy-building project, one that seeks to immerse global citizens within Tuvalu's natural beauty as a means of cherishing and preserving it through contemporaneous action. But the question then becomes: Is virtual empathy an effective tool for global audiences to feel connected to current-day Tuvaluans and their physical lands and tangible culture?

Lisa Nakamura has an interesting stance on the effectiveness of virtual empathy as a legitimate tool to push for meaningful social change among global citizens. Nakamura (2002) writes of the role racial avatars play often as a sort of "orientalized theatricality" as a form of "identity tourism" (p. 32). She warns of the dangers of "'toxic empathy' that enables white viewers to feel that they have experienced authentic empathy for these others" (Nakamura, 2020, p. 47) as "virtuous VR does not preclude more useful ways of addressing the real world that it frames as a site of suffering" (Nakamura, 2020, p. 61). Efforts to imbue empathy within virtual worlds often enable people of the majority population to experience the lives of a person from a marginalized group in a brief moment, but they often do not have a personal stake or deep-seated roots in that racial or ethnic struggle. What Nakamura describes as a challenge with racial avatars can only be amplified with entirely virtual worlds of lesser-known island nations in the Global South such as Tuvalu. Rather than viewing Tuvalu's lands and oceans as a real entity worth sacrificing for and saving, the user may instead look at it akin to a museum artifact, experiencing the fleeting memory of disaster tourism without a strong enough personal or emotional investment needed to react to the call to action. No amount of digitization can substitute for the physical presence of an actual living and breathing human being and the smells and sights of the beautiful island nation of Tuvalu.

The question remains: who is this virtual environment primarily being built for? Is its primary audience still the people of Tuvalu to hold on to their culture and lands in a dystopic climate future? Or is

it for the people of Western Educated Industrialized Rich and Democratic countries to admire and appreciate a lost civilization that their actions indirectly will have led to collapse?

Conclusion

It is an unfortunate consequence of climate change that the nation of Tuvalu is forced into sociotechnical change in the form of this digitization effort. As Tuvalu embarks on this new journey to adapt their sense of nationhood and culture into the metaverse, this essay can play the important role of highlighting some of the potential challenges that may arise and how to mitigate them.

Thinking about surveillance concerns with cloud-based archives, reconsidering how society thinks about nationhood and sovereignty in the context of servers and digital infrastructure, and being intentioned in determining the digital public and effectiveness of empathy activating social change should be at the forefront of Tuvalu's Future Now project and other digitization and archiving projects that might inevitably come out of the next century of sociotechnical change.

Tuvalu needs to negotiate for themselves how to navigate this sociotechnical change; I have laid out what I foresee as potential challenges down the road, but it is ultimately the decision of Tuvalu's government and people to determine what kind of digital future they want for their nation, mediating dynamics ranging from surveillance to sovereignty to empathy.

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