

CARE Statement for Indigenous Data Sovereignty



Our Common Agenda Global Digital Compact March 2023: CARE Statement for Indigenous Data Sovereignty

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The Wampum Lab at the University of Waterloo and the *Collaboratory for Indigenous Data Governance* partnered to co-develop the **CARE Statement for Indigenous Data Sovereignty**. This statement builds on the work of the Global Indigenous Data Alliance, including the CARE Principles for Indigenous Data Governance. From outreach and planning to virtual co-writing sessions, the team created this statement with the intent for it to inform the drafting of the Global Digital Compact and become a catalyst for Indigenous data sovereignty, ethical data governance, and interdisciplinary justice action.

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We acknowledge the Indigenous Peoples and their lands on which we live and work, recognizing that our collaboration emerges from a commitment from each one of us to our relatives, communities, and constituents. Our work is anchored by our shared values and goals around Indigenous Peoples' rights to, interests in, and relationships with their data, information, and knowledges. We acknowledge and hold accountability to our ancestors, our knowledge keepers including the land, water and our non-human kin. We acknowledge ancestors who came before us, and youth who will continue keeping and sharing our knowledges with generations to come.

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- Cover Image: *I-WITNESS CULTURE*, Acrylic on Canvas 40 x 30 in 2014
- Back Image: *Let Swipe The Dogs Of War*, Mixed Media Acrylic on Canvas 36 x 48 x 2 in 2017

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This statement was prepared in collaboration by The WAMPUM Lab and the Collaboratory for Indigenous Data Governance and affiliated authors in their personal capacity.

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CARE Statement for Indigenous Data Sovereignty

Digital technologies empower billions of individuals worldwide, creating seemingly endless opportunities, and advancing social progress (UN, 2021a). The Global Digital Compact (GDC) processes claim to “outline shared principles for an open, free and secure digital future for all” to achieve universal connectivity by 2030 (UN, 2022; UN 2023). In other words, the GDC acknowledges the relevance of diversity in pursuit of ensuring meaningful consultation from all stakeholders, rights and titleholders. *Globally*, however, approximately 2.9 billion people are excluded from the digital tech world (ITU, 2021). Yet all of humanity is impacted by the decisions made within these digital ecosystems, highlighted by the digital communication discrimination that occurred during the COVID-19 pandemic (UN, 2021a). We applaud the UN Secretary General’s inclusion of the proposed Global Digital Compact (GDC) as part of Our Common Agenda and ***encourage that it supports Indigenous Peoples as rights and titleholders under the United Nations Declaration on the Rights of Indigenous Peoples.***

As technology continues to advance at an accelerated rate, the ways in which data are governed and managed are essential to achieve digital equity. Moreover, there will be an increased reliance on data in the digital age when it comes to government policy and decision-making (Walter et al., 2021). The GDC should embody a sustained commitment centered not only on human rights but Indigenous Peoples’ rights, ensuring that all voices are included. Global digital inclusion is necessary to develop and advance knowledge societies and “bridge the digital divide” (UN, 2021a). In particular, accelerating progress toward digital inclusion for all must include Indigenous Peoples (UN, 2021a).

Therefore, we are calling on all member states to prioritize the support of Indigenous Data Sovereignty (IDSov) and the integration of Indigenous Data Governance (IDGov) into the GDC from its inception. It is important to note that IDSov is exercised by Indigenous rights and title holders, thus exclusively operationalized by Indigenous Peoples. Whereas non-Indigenous Peoples can support IDSov through IDGov, the activating agent that can be institutionally practiced across all peoples. Doing so serves to increase Indigenous Peoples’ access to, use of, and benefit from, data and technology while enhancing their rights to self-determine how to govern, steward, and share their data (Carroll et al., 2019).

Existing principles within the open data movement include the FAIR Guiding Principles (Findable, Accessible, Interoperable, Reusable), the CARE Principles for Indigenous Data Governance (Collective benefit, Authority to control, Responsibility, Ethics), and the TRUST Principles (Transparency, Responsibility, User Focus, Sustainability, Technology) (Carroll et al., 2020; FAIR, 2016; Lin et al., 2020) (See Figure 1).



Figure 1: FAIR Guiding Principles & CARE Principles for Indigenous Data Governance (GIDA, 2022b).

Developed for data sharing, the FAIR Guiding Principles prioritize reusing digital assets, but lack ethics and protections for Indigenous sovereignty involved in the making of the data (Haak, 2020), digital infrastructures, and data policies and practices (Carroll et al., 2021b; GIDA, 2022b). On the other hand, the CARE Principles are people and purpose-oriented, thus reflecting the integral and inherent relationships involved with Indigenous data, with the aim of advancing Indigenous governance (Carroll et al., 2020). Data related/linked to Indigenous Peoples must be controlled accordingly, by Indigenous Peoples. This can be pursued through the implementation of the CARE Principles (Carroll et al., 2022). Moreover, the TRUST Principles are designed to increase the “digital repository trustworthiness” by ensuring best practices are implemented (Lin et al., 2020). Integrating the FAIR, CARE and TRUST Principles is necessary to achieve digital equity *in a good way*. Thus, to close the digital divide, the GDC must include training sessions that enhance digital inclusion to achieve equitable access to the global information society (UN, 2021a). Technology cannot replace Indigenous ways of knowing, but it can help to compile a rich, historical archive to record and preserve knowledges for future generations (UN, 2021a).

To effectively and genuinely integrate these principles, IDGov must be at the forefront of the GDC. This integration would support Indigenous rights and promote digital connectivity, outlined within the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) (UN, 2007). There are multiple UNDRIP articles relevant to IDGov, such as Article 8.1, Article 11.1, Article 12.1, and so on. Specifically, Article 18 and Article 31, stipulate the “right to participate in decision-making in matters which would affect their rights” and the “right to

maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures” (UN, 2007). These Articles epitomize **Indigenous Data Sovereignty (IDSov)**, which **“refers to the right of Indigenous Peoples to govern the collection, ownership, and application of data about Indigenous communities, peoples, lands, and resources”** (Rainie et al., 2019).

The inclusion of IDSov in the GDC will defend and extend global digital rights. In particular, the UN’s power has the capacity to forge consensus on global digital issues from gender violence, discrimination, racism, youth exclusion, and ultimately digital colonialism. A timely and transparent communication with all stakeholders, rights and title holders throughout the process of the GDC development must be inclusive not only of the 6 official languages of the United Nations, but must be transferable to protect and support Indigenous languages and end the monopolization of English in digital spaces.

1. Connect all people to the Internet, including all schools

Indigenous communities face several challenges when it comes to Internet connectivity. One of the most significant challenges is the lack of infrastructure and resources in Indigenous territories and remote areas. Indigenous Peoples living in rural or remote areas often lack access to the necessary infrastructure needed for reliable Internet connectivity, including fiber optic cables and cell towers. In addition, high costs associated with Internet connectivity also pose a significant challenge for Indigenous communities. Many individuals and families living on Indigenous territories and/or in remote areas may not have the financial means to afford high-speed Internet or even basic equipment such as computers or smartphones. The lack of infrastructure and high cost of Internet connectivity can make it difficult for individuals to access education, job opportunities, and essential services (Duarte et al., 2021). To address these inequities, it is important to consult with Indigenous Peoples to determine what Internet access and sustainable connectivity mean to them. An excellent model for future collaborative engagement processes is the Indigenous Connectivity Summit, which brought Indigenous Peoples together to explore, define, and “develop their own connectivity solutions” (Campbell, 2018, p. 3).

Recommendations from the summit included:

1. Creative connectivity solutions that focus on sustainability.
2. An enabling environment of supportive policies, funding opportunities and public education.
3. Capacity building and education within communities.
4. Easier access to spectrum for Indigenous communities.
5. Collaborative backhaul solutions founded on future-proof technology.
6. Research on the state of Indigenous connectivity across North America. (p. 2)

These recommendations aim to "promote sustainable connectivity" (Campbell, 2018, p. 2). Integrating these recommendations advances Indigenous self-determination and autonomy while

connecting Indigenous Peoples to the Internet “on their own terms” (Campbell, 2018, p. 4). Other Indigenous institutions and coalitions have also formed to respond to the lack of Internet connectivity for Indigenous Peoples across national jurisdictions.

The National Congress of American Indians (NCAI) advocated that the United States Federal Communications Commission (FCC) increase and improve its broadband data deployment to ensure that Tribal Nations have access to an equitable digital future. For example, the Pamunkey Tribal Headquarters (Virginia) does not have access to broadband, meanwhile the Makah Tribe (Washington) must bus students 40+ minutes to take standardized testing (Blackwater, 2021). With that said, in 2022 the Biden-Harris Administration launched a \$45 Billion “Internet for All” Initiative (U.S. Department of Commerce, 2022). The aim of this initiative is to bring affordable and reliable broadband high-speed Internet to everyone within the United States. It is vital that this Initiative includes addressing affordability and access issues in unincorporated territories where Indigenous Peoples in Puerto Rico, Guam, American Samoa and other island territories also face rampant digital colonialism. In addition to the “Internet for All” program, the Affordable Connectivity Program (ACP) aims to increase the affordability of the Internet (The White House, 2023). However, barriers continue to exist as program applicants must have access to the Internet to complete the online application (FCC, 2023). As illustrated, many Indigenous Peoples do not have equal access to the Internet. Unfortunately, this is also true for many Māori and Pacifica households in Aotearoa/New Zealand who lack Internet connectivity (Carr, 2020). This disadvantage has a significant impact on their ability to participate fully in the digital age. They often struggle to access important information, connect with others, and access vital services. The COVID-19 pandemic exacerbated many of these pre-existing Internet connectivity injustices for Indigenous Peoples, furthering divides in access to education, healthcare, and economic opportunities (Carr, 2020).

Similarly, in Canada, Lockhart et al. (2014) noted that even where a First Nation has access to high-speed Internet connectivity in educational and administrative buildings, that connectivity often does not extend to all households on reserve, interfering with Indigenous Peoples’ ability to continue studies and work from home. This is not an isolated incident as many First Nations reserves across Canada experience severe Internet connectivity issues. According to recent data, only 34.8 percent of First Nations People residing in these areas have access to a 50/10 Mb/s connection (Ahmmed et al., 2022). This lack of reliable Internet access can have significant impacts on education, healthcare, and economic opportunities for these communities. It is essential that governments work towards providing equal access to Internet services for all Indigenous Peoples, regardless of where they reside. Solutions to address connectivity include the deployment of satellite-based systems rather than fiber optics. However, the existing mechanisms for accessing wireless spectrum licenses do not provide equitable pathways for Indigenous ownership and control. Connecting Indigenous communities to high-speed broadband Internet is imperative for promoting reconciliation, including economic reconciliation, and realizing Indigenous self-determination (Ahmmed et al., 2022; Hobart and Woodhouse, 2022).

Access to reliable and fast Internet connectivity enables these communities to preserve their culture, language, and heritage while also promoting economic development and education. The availability of dedicated wireless spectrum over Indigenous territories plays an important role in achieving this goal. It is vital for governments and the GDC to acknowledge the significance of this issue and take the necessary steps to ensure that Indigenous communities have access to dedicated spectrum.

However, we cannot stop at affordability and accessibility. It is not only important to create and implement equitable digital infrastructure and policies, but it is also necessary to understand the cultural significance and utilization of the data. For example, historically, Indigenous biomedical data has been exploited for scientific research (Carroll et al., 2022). Oftentimes, data collection practices overlook community rights, benefits and interests, ultimately justifying Indigenous Peoples' reluctance to share health data (Carroll et al., 2022; Claw et al., 2018). Even when the original data collection of this genetic material is collected under rigorous ethical protocols, the strict mechanisms practiced during collection are omitted when data are uploaded to broad-scale databases, resulting in the commodification of Indigenous Peoples' DNA and other health data (Carroll et al., 2022; Fox, 2020). Thus, policies must be implemented to ensure that agreements made during data collection cannot be broken during data sharing.

Technological developments continue to advance at an accelerated rate, transforming every sector across the globe. From healthcare to entertainment, education to employment, acquiring digital skills is becoming increasingly necessary to meet and harmonize with the ever-moving pace of today's society. However, globally there is a significant percentage of the population who lack access and opportunity to technology and the Internet of Things (IoT) (Ang, 2020). For example, in the United States, approximately 24 million people, or 1 in 5 households, lack access to high-speed Internet (NTIA, 2023). This digital divide is not unique to the U.S., with many other countries experiencing similar disparities. Moreover, the lack of access to the Internet disproportionately affects marginalized communities, including Indigenous Peoples, people with disabilities, low-income households, and rural communities. From cost and affordability to accessibility, universal Internet access must become a basic human right (UN, 2021c). Several strategies can increase Internet connectivity in Indigenous communities, especially in remote areas. A necessary approach is to develop policies and initiatives that target Internet connectivity in these remote areas, such as investing in infrastructure development. This can be achieved by building more cell towers, fiber optic networks, and deploying satellite-based systems. To accomplish this there is also the need for economic support programs to provide pathways for Indigenous Nations and communities to access the necessary capital to develop and own these infrastructures without incurring exponential debt (Couture and Toupin, 2019; Duarte, 2017; Kwet, 2022). Overall, these approaches can help to improve access to the Internet in Indigenous territories and remote communities.

Protecting the rights of Indigenous Peoples to access education is essential for promoting equitable opportunities for all individuals. This is particularly important when it comes to digital education, given the increasing importance of technology in our global society. Indigenous communities must be able to access digital education and STEM education to remain competitive and to ensure their voices are heard in the digital age. UNDRIP Article 14: Right to Education represents the rights of Indigenous Peoples, especially youth, to “establish and control their educational systems and institutions providing education in their own languages, in a manner appropriate to their cultural methods of teaching and learning” (UN, 2007). Moreover, this Article states that,

Indigenous individuals, particularly children, have the right to all levels and forms of education of the state without discrimination. States shall, in conjunction with Indigenous Peoples, take effective measures, in order for Indigenous individuals, particularly children, including those living outside their communities, to have access, when possible, to an education in their own culture and provided in their own language. (UN, 2007)

This includes access to digital education and STEM education, as well as the resources and support needed to succeed in these fields. Furthermore, ensuring Indigenous rights to digital education and STEM education is essential for promoting diversity and inclusion in the technology industry. For example, IndigiData is an Indigenous digital education program that offers a one-week workshop to undergraduate and graduate students. The workshop provides an Indigenous-centered curriculum and is led by a community of Indigenous data scientists and guest faculty. The program focuses on data sovereignty and ethics, as well as providing hands-on experience and training in data science and informatics. By incorporating Indigenous culture into the curriculum, IndigiData aims to inspire the next generation of innovators and strengthen Indigenous communities (IndigiData. 2023). Through inclusive and culturally sensitive programs like IndigiData, the valuable contributions of Indigenous Peoples can be recognized and utilized, not only in the field of data science but also in broader societal advancements.

Indigenous Peoples bring unique perspectives and experiences to the table, which can help drive innovation and foster greater collaboration across cultural and national boundaries. Moreover, as the frequency of pandemics increases, the likelihood of work experience and education transitioning to online platforms will rise (Ahmmed et al., 2022; Robinson, 2022). Access to the Internet can be revolutionary as it increases an individual’s opportunity for education, business, healthcare, and more (Greenfield, 2020). Thus, another critical strategy is to increase funding and resources for Indigenous schools and educational institutions in Indigenous communities. Schools play an essential role in providing access to education, and by supplying resources such as computers and high-speed Internet, Indigenous students can receive a quality education and develop the skills they need to succeed in the digital age.

Protecting the rights of Indigenous Peoples to digital education is also important from a cultural perspective. Indigenous languages and cultures are unique and must be preserved for future generations. By ensuring that Indigenous communities have access to digital education, they can develop and share resources that help preserve their cultural heritage, including language, traditional knowledge, and cultural practices (Campbell, 2018).

To realize its commitments to connect all people to the Internet, including all schools, the Global Digital Compact should:

- Invest in infrastructure development to improve access to Internet connectivity in Indigenous communities.
- Ensure affordability and accessibility of high-speed Internet, including addressing affordability and access issues in areas where Indigenous Peoples face digital colonialism.
- Increase funding and resources for schools and educational institutions in Indigenous communities to provide resources such as computers and high-speed Internet, enabling Indigenous students to receive a quality education.
- Ensure Indigenous rights to digital education and STEM education, including access to resources and supports needed to succeed in these fields.

2. Avoid Internet fragmentation

The issue of Internet fragmentation is a growing concern in the digital age, as it can lead to the creation of separate and distinct online communities, which may not be able to communicate or collaborate effectively with each other. A fragmented Internet means that a system is not fully interoperable, and research suggests that the likelihood of the Internet splintering into “islands of connectivity” is increasing (Drake et al., 2016). This can create significant challenges for Indigenous individuals, businesses, and governments alike, and it is important that steps are taken to avoid this fragmentation. For Indigenous Peoples, Internet fragmentation can further marginalize their communities and limit their ability to connect with other groups and access critical resources and information (Jonas and Burrell, 2019). Settler-colonial state hegemonic attempts to control Indigenous Peoples’ use of the Internet must not be tolerated. The Global Digital Compact can promote Indigenous sovereignty and champion Indigenous Peoples’ rights to free Internet use unrestricted by settler-colonial censorship.

To maintain a cohesive and connected digital environment, fragmentation in the digital ecosystem, which can significantly affect the way Indigenous Peoples use and access the Internet, must be addressed. This requires addressing the three main types of fragmentation: 1. Technical fragmentation driven by technological developments, 2. Governmental fragmentation driven by government policies, and 3. Commercial fragmentation driven by commercial practices (Drake et al., 2016). The issue of online violence has increasingly become a significant

challenge in the digital ecosystem that can be exacerbated by internet fragmentation. Women and youth are especially vulnerable to online violence, which can take the form of cyberstalking, harassment, bullying, and other forms of abusive behavior. This phenomenon has emerged as a result of the growth of social media and other online platforms that have enabled greater connectivity but also facilitated the spread of harmful content. The fragmentation of the Internet exacerbates this problem as it creates separate and distinct online communities that can foster harmful and abusive behavior. This is a major concern for Indigenous Peoples, who are extremely vulnerable to these forms of harassment and abuse (Carlson and Frazer, 2021; Cassels, 2019). Therefore, stopping online violence, especially for women and youth, requires not only tackling its root causes but also limiting Internet fragmentation by promoting a more cohesive and connected digital ecosystem (Simon, 2023). If adopted, these protocols will not only protect the rights of Indigenous Peoples in digital spaces but also ensure their voices are heard and respected online.

Another important consideration is the need for greater Indigenous representation in digital technology fields and governance (Bang et al., 2013). Indigenous Peoples have a unique perspective on technology and the Internet, and their knowledge and expertise should be valued and incorporated into the development and governance of digital systems. For example, students from Kaktovik, Alaska invented “Kaktovik Numerals”, an unparalleled decimal system inspired by Iñupiaq, the Alaskan Inuit language using “an oral counting system built around the human body” (Tillinghast-Raby, 2023, Figure #2).

As of 2022, the UC Berkeley Department of Linguistics’s *Script Encoding Initiative* included the Kaktovik Numerals in Unicode. Unicode 15.0 “provides a virtual identifier for each Kaktovik numeral so developers can incorporate them into digital displays” (Tillinghast-Raby, 2023). This example is one of many that illustrates Indigenous Peoples’ contributions to technology when given access to resources and institutional support.

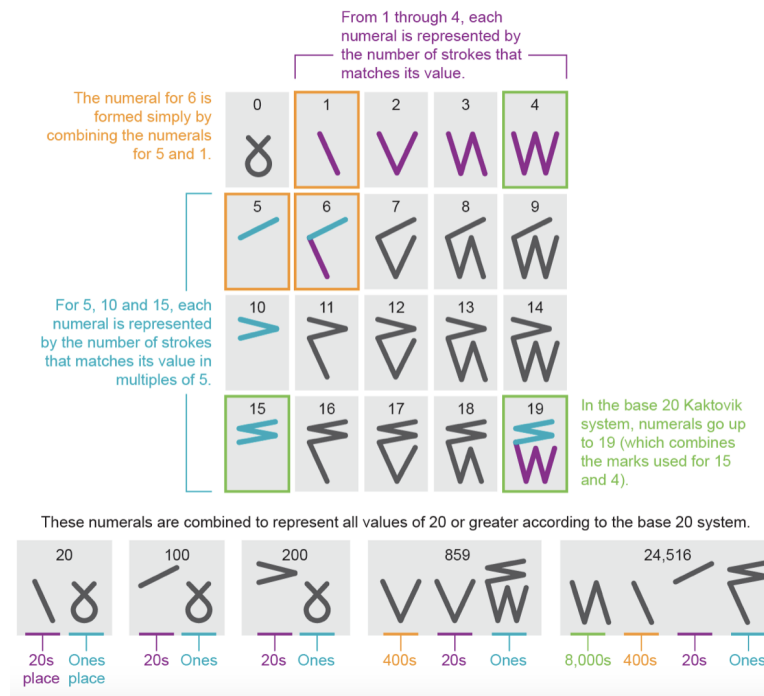


Figure #2: Kaktovik Numerals, “Western Hemisphere’s first new number system in more than a century” (Tillinghast-Raby, 2023).

In addition, the GDC must advocate protecting the use of Indigenous names and languages online from digital harassment and structural oppression. In 2015, Indigenous Facebook users reported having their accounts flagged and access to the social media platform revoked because their Indigenous names were flagged as “not real” (Bowman, 2015; Haimson and Hoffmann, 2016). Regrettably, such instances are prevalent not only on social media but also on digital platforms that do not accommodate the naming conventions and alphabets (e.g. pictorial, syllabic, etc.) unique to Indigenous Peoples. For example, Indigenous families often have to fight to have their child’s name reflected accurately on their records of vital statistics, including birth certificates and other forms of identification (McKenzie, 2023). As a consequence, Indigenous Peoples are being excluded from digital platforms, further fragmenting the Internet. Mitigating this issue requires a multifaceted approach, which includes disrupting the “colonial algorithm” with the formulation of new policies and guidelines, as well as promoting Indigenous scholars and digital activists into decision-making positions of power (Fredericks et al., 2022).

In addition to protecting Indigenous names and languages from exclusion on the Internet, it is also essential to carve out protected space and policies for Indigenous digital heritage. One research initiative working towards this goal is Local Context, which collaborates with Indigenous communities and organizations such as cultural centers, universities, and museums to manage, share, and protect Indigenous intellectual property, data and digital heritage by creating Traditional Knowledge (TK) and Biocultural Labels (BC) (Local Context, 2023). These labels “add cultural and historical context” as well as “cultural authority to cultural heritage content” in the Indigenous communities’ digital heritage archive, in addition to “libraries, museums and other digital repositories” across the globe (Local Context, 2023). Such labels are crucial for IDSoV and preventing Internet fragmentation of Indigenous Peoples as they help to ensure that Indigenous knowledge and cultural heritage are accurately represented and contextualized within the larger digital ecosystem. By adding cultural and historical context, these labels acknowledge the legal jurisdiction and cultural authority of Indigenous communities over their own heritage content and help to prevent misrepresentation or appropriation of Indigenous knowledge and cultural practices.

To this end, it is necessary for academic and global Internet institutions to play a key role in providing support and resources for the advancement of Indigenous digital scholars and practitioners. As digital technologies continue to develop and expand, Indigenous communities are increasingly at risk of being excluded from the digital sphere, perpetuating the effects of historical colonization. To address this issue, institutions must take the initiative to provide funding, resources, and mentorship opportunities to Indigenous scholars working in digital fields (Local Context, 2023; Small-Rodriguez, 2023). These actions will not only support the preservation and promotion of Indigenous knowledge and cultural heritage but also contribute to building a more connected and inclusive digital world. By collaborating with Indigenous scholars and communities, global institutions can help to avoid Internet fragmentation and promote greater equity and representation in the digital realm.

To realize its commitments to avoid Internet fragmentation, the Global Digital Compact should:

- Protect the rights of Indigenous Peoples in the digital space and ensure that their voices are heard and respected online, particularly in the context of online violence.
- Increase Indigenous representation in digital technology fields and governance to incorporate their unique perspective on technology and the Internet into the development and governance of digital systems.
- Provide funding, resources, and mentorship opportunities for digital Indigenous scholars through academic and global Internet institutions to promote greater inclusion and collaboration.

3. Protect Data

As we work towards creating a more connected and inclusive digital world, it is imperative that we center the principles of IDSoV and recognize the unique needs and perspectives of Indigenous communities. To this end, we advocate for the GDC to make commitments to protecting data through an IDSoV approach. IDSoV is Indigenous Peoples, communities, and Nations' inherent right to govern, steward, and control their own data (Walter et al., 2021). Among acknowledging and emphasizing the importance of data for advancing governance, innovation and Indigenous self-determination, the CARE Principles for Indigenous Data Governance address the data inequities and exploitation of Indigenous data (Carroll et al., 2020).

Indigenous data refers to data that is collected, produced, or used by Indigenous Peoples or communities, often in the context of research, policy development, or service delivery. It includes a wide range of information related to Indigenous knowledge, culture, language, land, and socio-economic conditions. Indigenous data is distinct from other forms of data because it reflects Indigenous perspectives, values, and priorities, and is often subject to unique ethical, legal, and cultural considerations. However, Indigenous data has repeatedly been abused. In the late 1990s, the Havasupai Tribe of Arizona granted access to their blood samples to researchers at Arizona State University for the purpose of studying the genetic basis of diabetes in their community (Lovett et al., 2019). However, without the Tribe's knowledge or consent, the samples were used for additional health research unrelated to the original purpose. The Havasupai People felt that their trust had been violated and sued the University for breach of contract, leading to a legal settlement and the return of the blood samples in 2004 (Lovett et al., 2019). The case highlights the importance of respecting IDSoV and the need for ethical and responsible research practices to protect Indigenous data (Lovett et al., 2019).

Established in 2018, the Native BioData Consortium (NBDC) created a goal to “leverage Indigenous sovereignty and keep biological samples and data from tribal members local to their

community” (NBDC, 2021). This internationally renowned Consortium is recognized for its achievements in Indigenous health equity through tribal research and policy (NBDC, 2021). This Consortium aligns with IDSov objectives, including Indigenous self-determination and autonomy over data (inclusive of knowledge and information systems), institutions, and resources (Walter et al., 2021). Similarly, IDGov is the inherent sovereign right of autonomy over Indigenous data (Carroll et al., 2019). IDSov and IDGov provide the framework for the protection of Indigenous data. According to Indigenous data scientists Carroll et al. (2020), Indigenous Peoples’ data includes:

- (1) Information and knowledge about the environment, lands, skies, resources, and non-humans with which they have relations;
- (2) Information about Indigenous persons such as administrative, census, health, social, commercial, and corporate and,
- (3) Information and knowledge about Indigenous Peoples as collectives, including traditional and cultural information, oral histories, ancestral and clan knowledge, cultural sites, and stories, belongings. (p. 3)

The CARE Principles for Indigenous Data Governance provide the mechanism to operationalize the ethical governance of Indigenous Data. The acronym "CARE" stands for Collective Benefit, Authority to Control, Responsibility, and Ethics (Carroll et al., 2020). These principles prioritize Indigenous self-determination and the protection of Indigenous knowledge, cultures, and intellectual property rights. They provide a framework for Indigenous communities and organizations to manage and govern their data in a way that aligns with their cultural values and ensures the responsible use of their data and the opportunity to maintain good data relations.

The concept of “relations” or relationality is central to Indigenous worldviews and ways of knowing. In the context of the previous quote from Carroll et al. (2020), relations can be understood as the connections and interrelationships that Indigenous Peoples have with various aspects of Indigenous data, including their environment, the non-human world, other people, and cultural traditions. Indigenous Peoples’ knowledge systems include the environment, such as land, skies, resources, and non-human beings, which they are connected and interdependent on through traditional ecological knowledge and practices. The interconnection and relationality are central to data stewardship across the data ecosystem and are informed by shared values, principles and protocols for ensuring relational accountability within Indigenous Peoples’ Nations, villages, and communities (Durie, 2004; Kovach, 2021). Additionally, understanding the relationships between Indigenous individuals, their communities, and the larger systems they operate within, such as census data, health records, and social and commercial interactions, is essential for addressing issues of equity and justice and promoting relational accountability (Oré et al., 2023). Finally, relations and relationality also encompass how knowledge and information are held and transmitted through generations and intergenerational agency is pivotal to Indigenous data sovereignty (IDSov) and governance (IDGov) (Littletree et al., 2020).

Therefore, protecting data is an important aspect of responsible and ethical research, particularly when working with Indigenous communities (Animikii Inc., 2022). The integration and utilization of tribal research codes can help ensure that research conducted with Indigenous communities is respectful, culturally appropriate, and prioritizes the well-being and interests of the community. Utilizing tribal research codes will allow organizations and communities to implement the CARE Principles to coincide and enhance the FAIR Guiding Principles (Carroll et al., 2022). The FAIR Guiding Principles provide a framework for making data more accessible and reusable, but they do not explicitly address issues of cultural sensitivity and Indigenous ownership. Research codes and institutional review board processes that embed the CARE Principles in conjunction with the FAIR Guiding Principles, allow for Indigenous Peoples and communities to have greater control over their data and ensure that their rights are respected.

This is in line with the National Congress of American Indians (NCAI) resolution, which calls for tribal control over data and biospecimens, highlighting the importance of Indigenous ownership and governance of data. The NCAI passed Resolution ABQ-19-061, which “calls on NIH [National Institutes of Health] to consult with Tribal Nations, provide a process for Tribal Nations to have oversight over any data and biospecimens from their tribal citizens, and restrict use of data associated with Tribal Nations until tribal oversight is in place” (NCAI, 2019). This resolution recognizes that Indigenous Nations are sovereign governments and that data associated with Tribal Nations should not be used without tribal consent. This is particularly important given the historical and continuing exploitation of Indigenous Peoples in research, thus it is essential to prioritize Indigenous-led research and foster increased collaboration and partnership between researchers and Indigenous communities. Overall, protecting data is not only necessary for responsible and ethical research but also for ensuring Indigenous self-determination and sovereignty.

Beyond research concerns, protecting data privacy and security is of critical importance for Indigenous Nations and Peoples. With the technological advancements in recent years, there has been a growing recognition of the need to protect personal data, particularly in the health and genomic fields. Though Macaulay et al. (1998) noted that the Code of Research Ethics, co-developed with Kahnawake School Diabetes Prevention Project, defined “community ownership”, Mohammed et al. (2012) found cause for concern due to nuances and varying interpretations of the term “ownership”. Moreover, in 2019, Woodbury et al. found that the management of health-related data involving Indigenous Peoples still needed improvement. This includes data within policies, protocols, and practices (Woodbury et al., 2019). In addition to addressing research conduct concerns, it is essential that policies and language in research agreements are drafted in a manner that is unambiguous and protects the privacy and security of data for Indigenous Nations and Peoples. Thus, it is vital that the GDC, in collaboration with Indigenous communities, explicitly define best practices for protecting Indigenous data privacy and security with a foundation built on IDSoV and IDGov principles.

While there have been some positive developments in data privacy legislation, there is still a long way to go. Indigenous Nations and Peoples face unique challenges when it comes to protecting their data, including accountability, privacy, and confidentiality on both an individual and collective level. It is important to scale data protections for Indigenous Nations and Peoples, including developing frameworks and regulations that address the specific needs of these communities. However, it is also essential to ensure that these frameworks are implemented effectively and that Indigenous communities have the resources and support they need to protect their data. This requires a coordinated effort from governments, technology companies, and community-based organizations, including investments in infrastructure, education, and training.

This effort should include the adoption of the CARE Principles in conjunction with the FAIR Guiding Principles, TRUST Principles and First Nations principles of OCAP (Ownership, Control, Access, and Possession) into data governance regimes (Carroll et al., 2020). The CARE Principles enhance the FAIR Guiding Principles and TRUST Principles by grounding its core in equity (Carroll et al., 2022). This method of governance shifts settler colonial consultation practices to instead focus on value-based relationships that prioritize Indigenous knowledge systems, culture, and science (Carroll et al., 2020). Adoption of the CARE principles by the GDC will promote the protection of Indigenous data privacy and security, and ensure Indigenous rights to self-determination and control over their data are respected.

To realize its commitments to protect data, the Global Digital Compact should:

- Acknowledge and emphasize the importance of UNDRIP and Indigenous data for advancing governance, innovation, and Indigenous self-determination.
- Encourage governments at national, regional, and global levels to implement the CARE Principles for Indigenous Data Governance to address the data inequities and exploitation of Indigenous data.
- Promote the integration of Indigenous research codes and the implementation of CARE Principles and FAIR Guiding Principles to protect Indigenous communities' data, recognize Indigenous data sovereignty, and prevent exploitation in research.
- Establish Indigenous Data Sovereignty as Indigenous Peoples, communities, and Nations inherent right to govern, steward, and control their own data.
- Protect data privacy and security by developing frameworks and regulations that address the specific needs of Indigenous communities.

4. Apply Human Rights Online

In the digital age, the need for upholding human rights has extended online. However, it is crucial to recognize that Indigenous rights must also be applied online, with a particular focus on bridging the digital divide and gaps impacting Indigenous Peoples, promoting digital inclusion for Indigenous Peoples, and supporting the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). To ensure that digital inclusion metrics align with UNDRIP, an IDSov/CARE lens must be applied to all interventions around digital cooperation and technologies. Moreover, it is necessary to pay special attention to the situation of Indigenous Peoples impacted by digital colonialism and place UNDRIP at the center of regulatory frameworks and legislation on digital technologies. Therefore, it is essential to explore how the Global Digital Compact can apply human rights online to promote the protection and respect of Indigenous rights. The Global Indigenous Data Alliance (GIDA) has created a list of rights to demonstrate Indigenous Peoples’ Rights in Data, specifically (Figure 3):



Figure 3: Indigenous Peoples’ rights in data (GIDA, 2023)

The purposes of these rights are to advocate for data management that abides by international laws and regulations and to progress and foster IDSov that furthers legislation and data protections (GIDA, 2022a; GIDA, 2023). It is important to note that digital inclusion metrics must align with UNDRIP. For example, Article 4 states, “Indigenous Peoples, in exercising their right to self-determination, have the right to autonomy or self-government in matters relating to their internal and local affairs, as well as ways and means for financing their autonomous functions” (UN, 2007). While OCAP “asserts that First Nations have control over data collection, processes, and that they own and control how this information can be used” (FNIGC, 2023).

To ensure equitable digital cooperation and technological development, it is important to consider and integrate existing Indigenous protocols and principles into the digital inclusion metrics. In other words, embodying these metrics based on collaborative efforts co-developed with Indigenous Peoples can provide a solid foundation for achieving this goal. Moreover, global society must recognize that Indigenous Peoples have existing research codes, data management protocols, and ethical guidelines to protect their rights and interests in digital spaces and for data. Therefore, policies and agreements related to digital technologies should refer to these documents to ensure that they are drafted in a manner that respects Indigenous Peoples' rights and sovereignty. By leveraging existing collaborative data frameworks, such as the CARE Principles, developed by and with Indigenous Peoples, this approach avoids redundancy and facilitates more effective, collaborative, and respectful relationships between technology stakeholders and Indigenous communities. This is particularly important as access to high-speed Internet becomes increasingly necessary for remote Indigenous communities, who face amplified inequalities during global pandemics and environmental catastrophes due to their lack of online services.

As climate change inevitably alters the planet and peoples' livelihoods, access to high-speed Internet is crucial. From accessing doctors and educational services to registering for COVID-19 vaccinations, bridging the digital divide is vital for remote Indigenous communities (Hobart and Woodhouse, 2022). Global pandemics and environmental catastrophes amplify the inequalities that Indigenous communities face as they lack access to online services (Carr, 2020; Carroll et al., 2021a; Hobart and Woodhouse, 2022). As we strive to bridge the digital divide and close the gaps impacting Indigenous Peoples, we must apply a human rights framework to our efforts. This includes supporting UNDRIP and aligning digital inclusion metrics with its principles (Kukutai and Taylor, 2016). This means placing Indigenous Peoples at the center of decision-making processes and ensuring that they have control over their own data. Taiuru et al. 2022 provide an example for the application of UNDRIP in digital ecosystems arguing for applying UNDRIP in the context of AgTech and agricultural big data in Aotearoa/New Zealand. They explore a Māori Data Sovereignty co-governance approach that honors Te Tiriti, He Whakaputanga, and/or UNDRIP and how the adoption of such principle documents disrupts the

power dynamics that perpetuate the inequitable trajectories of big data in agriculture. For instance, a co-governance approach could enable Māori to set the priorities and practices for collecting, storing, and using agricultural big data, which could result in a more collaborative, equitable, and just process (Taiuru et al., 2022). They also underscore that publicly funded projects imbue a fiduciary responsibility on settler colonial states, especially those with treaty obligations, to ethically create data infrastructures that support Indigenous Peoples' access, control, ownership and decision-making power as rights and titleholders (Taiuru et al., 2022).

UNDRIP also provides protections against digital colonialism, which often results in the exploitation and appropriation of Indigenous data, knowledge and resources (Roberts and Montoya, 2022). Mukosi (2022) highlights the connection between historical colonialism, assimilation policies, and contemporary digital colonialism in the context of adoption records for Indigenous adoptees in the United States. The article positions that to protect Indigenous rights and the rights of Indigenous children data policies must include the rights delineated in the UNDRIP, especially data policies applicable to adoption and children services (Mukosi, 2022). Therefore, one key step towards protecting Indigenous rights online is to place UNDRIP at the center of regulatory frameworks and legislation on digital technologies. This means recognizing and respecting the rights of Indigenous Peoples to self-determination, control over their data, and protection of their genealogical, linguistic and cultural heritage. It also means promoting Indigenous rights-based domestic laws and practices for the protection of Indigenous data privacy. These protections will also help to support thriving Indigenous languages in digital ecosystems.

The United Nations has recognized the importance of Indigenous languages by designating the period from 2022-2032 as the International Decade of Indigenous Languages (IDIL2022-2032) (UNESCO, 2022). The protection and revitalization of Indigenous languages are also recognized in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). As such, any efforts to promote and support Indigenous languages online must align with the principles of UNDRIP. The GDC needs to be inclusive of Indigenous languages in order to support IDIL 2022-2032. The inclusion of Indigenous languages in the GDC can help address the issue of language loss and promote linguistic diversity. As the Permanent Forum on Indigenous Issues highlighted, most endangered languages are Indigenous, and this puts at risk the cultures and knowledge systems they represent (UNESCO, 2022). Including Indigenous languages in the GDC can help provide access to Indigenous Peoples for digital tools, platforms and content in these languages. Digital libraries can be created by Indigenous Peoples with financial and legislative support from governments to house “cultural objects, stories, songs and ceremonies”, which can ensure that future generations will have access to Indigenous languages and culture in perpetuity (Campbell, 2018). This can be a key enabler to promote and protect Indigenous languages, and contribute to the objectives set out in the United Nations Declaration on the

Rights of Indigenous Peoples. The GDC can therefore play an important role in supporting the IDIL 2022-2032 and ensuring the preservation and promotion of Indigenous languages.

At the heart of our efforts to apply human rights online must be a commitment to centering Indigenous voices and perspectives. This includes engaging with Indigenous communities and organizations to develop policies and practices that are aligned with their needs and priorities. It also means creating opportunities for Indigenous Peoples to lead in digital technology fields and governance, and investing in their capacity to do so. By applying a human rights framework to our efforts to bridge the digital divide and promote digital inclusion for Indigenous Peoples, we can create a world where technology is used to promote rather than undermine Indigenous rights. This requires a concerted effort from governments, technology companies, and civil society organizations, but it is essential if we are to create a future that is just and equitable for all.

To realize its commitments to apply human rights online, the Global Digital Compact should:

- Advocate for research data management that abides by international laws and regulations and fosters Indigenous Data Sovereignty that furthers Indigenous rights.
- Ensure digital inclusion metrics align with UNDRIP principles, including Indigenous Peoples' right to self-determination and autonomy in matters relating to their internal and national affairs.
- Apply an IDSov/CARE lens to all interventions around digital cooperation and technologies.
- Support IDIL2022-2032 to address language loss, promote linguistic diversity, and preserve Indigenous languages.
- Place UNDRIP at the center of regulatory frameworks and legislation on digital technologies to protect Indigenous rights in digital spaces.

5. Introduce accountability criteria for discrimination and misleading content

Indigenous communities have long been victims of systemic discrimination and cultural appropriation, and the digital world is no exception (Carlson and Frazer, 2021). In recent years, there has been an increase in the use of false Indigenous identities, appropriation of Indigenous cultures, use of digital redface, and the spread of misleading content (Carlson and Kennedy, 2021; Fredericks et al., 2022; Miner, 2021). These instances have led to harm and perpetuated violence against Indigenous Peoples, particularly Indigenous women and girls (Bailey and Shayan, 2021; Carlson and Kennedy, 2021). There is an urgent need for accountability mechanisms to address these issues and prevent further harm. IDGov experts recommend a multifaceted approach that includes Indigenous-led governance and decision-making in digital technology fields, the protection of Indigenous names and languages from digital harassment and

structural oppression, and the regulation of online platforms that perpetuate discriminatory and harmful content.

One of the challenges in addressing this issue is the lack of clear and consistent definitions of what constitutes cultural appropriation and misleading content. Indigenous Peoples should be involved in defining these terms and creating guidelines for their enforcement. Online platforms should also be held accountable for the content they host and the impact it has on Indigenous Peoples and communities. Accountability for discrimination and misleading content is a critical component in ensuring that Indigenous women are safe in digital spaces, particularly when it comes to gamification and online video game platforms (Miner, 2022). As Indigenous Data Governance Experts, we recognize that the proliferation of digital spaces has resulted in increased instances of discrimination, harassment, and objectification of Indigenous women, which in turn has contributed to the ongoing issue of Missing and Murdered Indigenous Women (MMIW) (Bailey and Shayan, 2021).

It is essential that platforms and developers are held accountable for the creation and distribution of content that promotes violence against Indigenous women, including the use of rape scenes and objectification (Hoffin and Lee-Treweek, 2020). This type of content perpetuates harmful stereotypes and reinforces the notion that Indigenous women are disposable and unworthy of respect and dignity. It is not enough for platforms to simply remove this type of content after it has been brought to their attention; they must also take proactive steps to prevent its creation and dissemination in the first place.

One way to achieve this is through the development and implementation of comprehensive content moderation policies that specifically address discrimination, harassment, and violence against Indigenous women. The policy development should be co-developed with Indigenous Peoples and Elders (Campbell, 2018). These policies should include clear definitions of what constitutes harmful content, as well as robust reporting and enforcement mechanisms (Kennedy, 2020). In addition, platforms must be transparent about their content moderation practices, including the number of reports received, the actions taken in response, and any changes made to policies and procedures.

Furthermore, developers and platforms should work in partnership with Indigenous communities and organizations to co-create content that is respectful and accurate in its representation of Indigenous cultures and experiences. This will not only help to prevent harmful content from being created but also ensure that Indigenous voices are included in the development of digital spaces that impact their communities. Indigenous game developers have already started developing protocols for their industry rooted in sovereignty and are creating game spaces that reflect their diverse Indigenous cultures (LaPensée et al., 2022; Land, 2020; Miner, 2022). Although we are seeing growth in Indigenous game developers, there is a need for more

Indigenous representation in the technology industry to ensure that Indigenous perspectives and values are incorporated into the design and development of digital spaces. This can be achieved through initiatives that prioritize Indigenous hiring and training programs, as well as funding for Indigenous-led technology projects.

Finally, protecting Indigenous names and languages from digital harassment and structural oppression is crucial. This includes measures such as the development of tools for reporting and removing harmful content, as well as education and awareness campaigns to promote respect for Indigenous languages and cultures. Accountability for discrimination and misleading content is an integral aspect of creating safe digital spaces for Indigenous Peoples. Platforms and developers must take proactive steps to prevent the creation and dissemination of harmful content and work in partnership with Indigenous communities to create content that is respectful and accurate.

To realize its commitments to introduce accountability criteria for discrimination and misleading content, the Global Digital Compact should:

- Protect Indigenous names and languages from digital harassment and structural oppression.
- Establish national, regional, and global accountability mechanisms that track Indigenous hiring and training programs in the technology industry.
- Develop tools for reporting and removing harmful content targeting Indigenous names and languages.
- Develop and implement comprehensive content moderation policies that specifically address discrimination, harassment, and violence against Indigenous women.
- Hold online platforms accountable for the content they host and its impact on Indigenous communities.

6. Promote Regulation of Artificial Intelligence

Advancements in technology include rapidly expanding Artificial Intelligence (AI). Modeling Indigenous epistemologies, by treating non-human kin such as AI and other computational creations, with respect *and as kin*, can increase the chances that *all kin* will flourish (Lewis et al., 2018). However, if ethical relationships with AI are not established early on, the development and use of AI technology have significant implications for Indigenous rights, including intellectual property rights, privacy and data protection, and cultural and linguistic preservation. As AI systems generate, collect, and process vast amounts of data, it becomes imperative to protect Indigenous knowledge and intellectual property rights. Additionally, the use of AI must be subject to stringent privacy and data protection standards to prevent the misuse of personal information. Finally, the use of AI must also take into account the importance of cultural and

linguistic preservation for Indigenous Peoples (Holton et al., 2022). Although AI is increasingly being integrated into various aspects of our lives, including in areas such as healthcare, education, and finance, it is necessary to implement regulations on AI. Without regulations, AI has the capability to infringe upon human rights - including compromising IDSov.

To address these challenges, there is a need for regulatory frameworks and guidelines for the development and use of AI that align with the principles of IDSov and Indigenous rights. In 2020, the Indigenous Protocol and Artificial Intelligence Working Group developed a position paper on “Indigenous Protocol and Artificial Intelligence” in which they developed guidelines for Indigenous-centered AI design (Lewis et al., 2020). We encourage the GDC to adopt many of the pivotal recommendations put forward in the position paper at an international level. However, Indigenous protocols for AI development and use must also be developed and adopted on a local and regional basis (Abdilla et al., 2021). This includes ensuring that AI systems are designed and used in ways that respect Indigenous laws and the cultural and linguistic diversity of Indigenous Peoples, and that they do not perpetuate existing biases or inequalities (Roxanne, 2019; Tapu and Fa’agau, 2022). Recently, Munn (2023) applied Māori principles to evaluate AI design processes and concluded that (1) Indigenous metrics for AI are needed; (2) AI design must be decolonized; and (3) co-optation of Indigenous values avoided. According to Munn (2023),

Indigenous principles are not a smorgasbord where principles can be chosen as desired. In the same vein, splicing one or two concepts into a broader framework of Western values too often leaves them watered down or tokenistic. It would be easy for governments and corporations to gain social and cultural prestige by superficially parroting some of these values without any significant commitment behind them—indeed, we see such a pattern repeatedly in the past. (p. 7)

The GDC must encourage governments and corporations to prioritize Indigenous-led AI development and Indigenous-centered AI design to protect against misuse and misappropriation of Indigenous knowledge systems. Moreover, there is a need to address potential intellectual malpractices that may arise with the use of AI, particularly in relation to the protection of Indigenous knowledge and cultural expressions.

There are also potential risks associated with the use of AI technologies for Indigenous communities (Irwin, 2019). One risk is that AI systems may perpetuate existing biases and discrimination against Indigenous Peoples (Whaanga, 2022). For example, if AI systems are trained on biased data sets, they may produce biased outputs that perpetuate discrimination against Indigenous communities (Roxanne, 2019). Additionally, AI systems may be used to automate decision-making processes that should be made by humans, leading to a loss of human agency and control over important decisions. This requires a deeper understanding of the

implications of AI for Indigenous rights, which can be achieved through conducting global studies and engaging in dialogue with Indigenous communities.

There are several concerns related to AI regulation for Indigenous Peoples, particularly with the advancement of emerging technologies such as quantum computing, robotics, more powerful and inclusive language translators, conversational AI and assistants, generative and multi-modal AI, robotics, driverless cars, and other areas that AI research teams continue to work on (Lewis et al., 2020). The potential for AI is already being demonstrated. For example, a newly released Artificial Intelligence ChatGPT (Chat Generative Pre-trained Transformer) by OpenAI has successfully passed (60%) the United States Medical Licensing Exam (USMLE) (Kung et al., 2023). Similarly, created and trained on biomedical domain literature, PubMedGPT, a counterpart to ChatGPT, achieved an accuracy rate of 50.3% (Kung et al., 2023). Its ability for AI to breach systems is unknown - but it is likely that superintelligence is unable to be contained (Alfonseca et al., 2021).

One of the primary concerns is the potential for these technologies to exacerbate existing power imbalances and inequalities between Indigenous Peoples and non-Indigenous communities. Additionally, there is a risk that these technologies may not be developed or implemented in a culturally sensitive or appropriate way, leading to unintended negative consequences for Indigenous Peoples (Abdilla, 2021). For example, ChatGPT when asked to define Indigenous Data Sovereignty draws on correct information but fails to provide correct attribution, furthering Indigenous erasure and digital extractive colonialism. Therefore, it is imperative that AI regulations are developed in consultation with Indigenous communities and take into account their unique cultural and social contexts to ensure that these technologies are used in a way that benefits everyone.

AI has the potential to advance a wide range of rights, including environmental, economic, social, cultural, civil, and political rights. However, it is equally important to acknowledge that AI can also pose significant risks to these rights and can exacerbate existing inequalities and discrimination. A study by Robinson et al. (2022) investigated the potential for AI to perform “analytical modeling to assess and monitor ecosystems”, specifically monitoring the Nardab, a culturally significant wetland in Kakadu National Park, especially for the Bininj Peoples. Results suggest that through codesign, AI can be integrated accordingly to ensure on-the-ground decisions reflect the traditional and scientific methodologies that are culturally respectful of the socio-ecological systems inclusive of Indigenous Peoples (Robinson et al., 2022). Similarly, Wolf (2019) expresses how AI has the capacity to advance “cultural and linguistic revitalization”, ultimately empowering Indigenous Peoples and safeguarding knowledge for future generations. Thus, while AI presents potential benefits, it is necessary to ensure that its development and application are balanced with the protection of Indigenous rights. As demonstrated by Robinson et al. (2022) and Wolf (2019), codesigning AI systems with

Indigenous Peoples can lead to culturally respectful and scientifically accurate monitoring of ecosystems and revitalization of Indigenous languages and cultures. However, implementing AI policies that prevent bias and prioritize Indigenous rights is vital to avoid exacerbating existing power imbalances and perpetuating digital colonialism.

To advance Indigenous voices in AI technologies, The Lakota AI Code Camp (LAICC) is an initiative which promotes Indigenous involvement in the development and implementation of AI technologies. The three-week-long summer program provides Indigenous high school students with hands-on experience in developing personalized mobile applications using industry-standard software engineering practices, computer science, deep learning, and extended reality (LAICC, 2023). Through this program, Indigenous youth gain the skills and knowledge necessary to engage with AI in a way that aligns with Indigenous values and principles. Moreover, the program aims to inspire Indigenous students to pursue pathways into higher education and careers in advanced technology fields (LAICC, 2023). The LAICC represents an important step towards ensuring that Indigenous Peoples are not only included but also empowered in the development and implementation of AI technologies (LAICC, 2023).

To align AI development and use with Indigenous values and principles, IDSov must be prioritized by AI developers and policymakers. This involves respecting Indigenous communities' right to control and protect their data. To achieve this goal, Indigenous experts must guide AI development and use, and Indigenous communities should participate in the decision-making process. As AI becomes increasingly integrated into society, it is imperative to ensure that its development and use align with Indigenous values and principles. Policymakers should also prioritize the incorporation of Indigenous rights and perspectives in regulatory frameworks and legislation surrounding AI. Failure to incorporate IDSov in AI development and use risks perpetuating historical injustices and further eroding Indigenous Peoples' rights and sovereignty (Carroll et al., 2020; Tsosie, 2020). Shedlock and Hudson (2022) underscore the immediate danger of AI that excludes Indigenous knowledge systems and advocate for a new model “Māori IT Artefacts” built upon Kaupapa Māori (Māori principles and ideas which act as a base for action). The authors further emphasize the urgency many Indigenous Peoples currently feel with the rapid progression of AI forcing Indigenous technologists and government leaders into “fight mode” to protect their sovereignty, ways of knowing and being, and rights to self-determination (Shedlock and Hudson, 2022, p. S28). Thus, there is a need for Indigenous-led regulation of AI that prioritizes the protection of IDSov.

The potential for Indigenous-led AI regulation is promising, but it also faces challenges. One challenge is the lack of resources and infrastructure for Indigenous communities to lead AI development and regulation. Another challenge is the need for non-Indigenous researchers and developers to engage in meaningful and respectful consultation with Indigenous communities when new AI instruments are being conceptualized. It is essential to have Indigenous leaders in

AI and developers who possess firsthand experience and knowledge of diverse Indigenous epistemologies. This ensures that AI systems incorporate Indigenous values and follow the required protocols for cultural expansion in these new technological spaces (Kesserwan, 2018). Indigenous Nations, alongside other governments, will have to create dedicated laws for the regulation of AI in line with their Indigenous values and legal systems (Abdilla et al., 2021; Maitra, 2020).

The need for Indigenous-led regulation of AI arises from the historical and ongoing colonization and exploitation of Indigenous knowledge and data. Indigenous communities have long been subjected to extractive research practices, where researchers and corporations collect data and knowledge without consent, often leading to the exploitation of Indigenous Peoples and communities. The development and use of AI systems without Indigenous input or consent can exacerbate this harm (Abdilla, 2021; Shedlock and Hudson, 2022). Ultimately, AI regulatory frameworks and guidelines must be designed in consultation with Indigenous Peoples and be guided by the principles of Indigenous Data Sovereignty, Indigenous rights, and the UNDRIP. By doing so, we can ensure that the benefits of AI are realized in ways that are inclusive and respectful of the rights and values of all people, including Indigenous Peoples.

To realize its commitments to promote the regulation of artificial intelligence, the Global Digital Compact should:

- Develop regulatory frameworks and guidelines for the development and use of AI that align with Indigenous data sovereignty and Indigenous rights.
- Ensure that AI systems are designed and used in ways that respect the cultural and linguistic diversity of Indigenous Peoples and do not perpetuate existing biases or inequalities.
- Address potential intellectual malpractices that may arise with the use of AI, particularly in relation to the protection of Indigenous knowledge and cultural expressions.
- Conduct studies and engage in dialogue with Indigenous communities to achieve a deeper understanding of the implications of AI for Indigenous rights.
- Encourage governments at national, regional, and global levels to develop AI regulations in consultation with Indigenous communities and take into account their unique cultural and social contexts to ensure that these technologies are used in a way that benefits everyone.
- Promote Indigenous involvement in the development and implementation of AI technologies through Indigenous youth STEM programs like the Lakota AI Code Camp.

7. Digital Commons as a Global Public Good

The Digital Commons as a Public Good is concerning for Indigenous Peoples and Indigenous data governance scientists working to protect the ownership, control, and use of Indigenous data and knowledge. Firstly, the phrasing “Digital Commons as a Public Good” is ambiguous and lacks clarity of intent and purpose when discussed by Indigenous data sovereignty experts. Some put forward the idea of “digital public goods” as one conceptual lens through which to vision the potential GDC concept of a digital commons. Digital Public Goods include: “open source software, open data, open artificial intelligence models, open standards and open content” (UN, 2020). While the potential benefits of Digital Public Goods, such as open source software, open data, and open artificial intelligence models, can be significant, Indigenous communities are rightly concerned about the potential for their data and knowledge to be misused or exploited. There is also a concern that open standards and open content may not adequately reflect Indigenous cultural values and priorities. Indigenous communities and leadership (i.e., traditional/cultural leaders, tribal governing entities), are calling for greater control over their data and knowledge, and for the development of culturally appropriate governance frameworks that take into account their unique perspectives and concerns (Campbell, 2018; Caroll et al., 2019; Sporle et al., 2020; Tsosie et al., 2021; Walter et al., 2021). This includes ensuring that Indigenous communities have a say in how digital commons are created, accessed, and used; that these goods are designed and governed in ways that reflect Indigenous values and priorities; and that the benefits of digital commons accrue to Indigenous communities.

Despite the potential benefits of public goods in the context of emerging technologies, Indigenous Peoples have legitimate concerns about the use of the term “public” in this context. This is due to a history of disregard for Indigenous rights and ownership of resources in the creation of public goods (Birkinbine and Kidd, 2020; Kidd, 2020). One example is the U.S. Homestead Act of 1862, which allowed American settlers to claim up to 160 acres of surveyed government land without consideration of Indigenous land claims (NPS, 2021). Or how many existing National Parks and Protected Areas were created by illegally taking Indigenous lands and waters to reclassify them in the commons as “public goods” for settler enjoyment while at the same time prohibiting Indigenous Peoples’ access and stewardship (Domínguez and Luoma, 2020; Kohn, 2020). More recently, approaches to public health at national levels that do not consider Indigenous Peoples as socio-political collectives dilute the effectiveness of engagement and interventions in Indigenous communities (Anderson et al., 2016; Bauer and Plescia, 2014; Hudson et al., 2020; Reid et al., 2019). In other words, although “public good” often carries a sense of solidarity in global and national policy, it can also be a tool for dominance, assimilation, and erasure without a robust, underlying infrastructure of Indigenous self-determination (e.g., UNDRIP). Especially with the GDC, in which the digital world seems inescapably “common” because of its connective power, discussions of public goods need to account for this dynamic.

In the context of discussions about public goods and the digital world, one area that has gained increasing attention is that of open data. Open data is a concept that advocates for the unrestricted sharing of structured data that can be accessed, used, and built upon without limitations. This movement has gained popularity in recent years due to the potential benefits it brings to scientific research and innovation. However, the open data movement has been criticized for not fully considering Indigenous Peoples' rights and interests (GIDA, 2022a). “Indigenous data sovereignty (IDS) provides a framework for maximizing the benefit of open data for Indigenous Peoples and other users of Indigenous data and for affecting the stewardship of all data” (Rainie et al., 2019). Indigenous data sovereignty (IDSov) recognizes that Indigenous Peoples have unique rights and responsibilities regarding the collection, use, and dissemination of data (Walter et al., 2021). IDSov emphasizes the importance of data governance that is grounded in Indigenous knowledge, values, and ethics. According to Walter et al. (2021), open data infrastructures and processes must be inclusive of Indigenous Peoples as decision-makers and empower existing IDSov networks to co-develop open data policies. To operationalize the FAIR Guiding Principles with CARE Principles for Indigenous Data Governance, the GDC must consider the power dynamics and historical contexts that have shaped data collection and sharing practices. This requires engaging with Indigenous communities in a meaningful and respectful way and acknowledging their rights to control and act on their governance over data, especially in transitions to open data as a digital commons.

Overall, it is important to balance the benefits of open data and the digital commons with the need to protect Indigenous data and uphold Indigenous Peoples' rights and interests. By incorporating IDSov principles and engaging in ethical and collaborative IDGov practices, we can work towards a more equitable and just approach to data sharing and use.

To realize its commitments to digital commons as a public good, the Global Digital Compact should:

- Prioritize the development of culturally relevant/responsive data governance frameworks that take into account Indigenous perspectives and concerns and operationalize CARE Principles.
- Ensure Indigenous Peoples and communities have a say in how digital commons are defined, created, accessed, and used.
- Encourage governments at national, regional, and global levels to recognize the history of disregard for Indigenous rights and ownership of resources in the creation of public goods and create solutions to not replicate historical wrongs in future digital spaces.
- Ensure the benefits of digital commons accrue to Indigenous Peoples and communities.

8. Spectrum Sovereignty

Indigenous Peoples have been disproportionately impacted by the misallocation of wireless spectrum without their free, prior, and informed consent. Therefore, it is crucial that the Global Digital Compact (GDC) makes commitments to spectrum sovereignty in order to promote the rights of Indigenous Peoples and ensure equitable access to digital spaces and technologies. “Spectrum sovereignty” refers to the concept of Indigenous Peoples’ rights, treaties, laws, and jurisdiction including digital spaces and emerging metaverses (Blackwater et al., 2022; Gagnon, 2021; Wheelock, 2022). This includes the right to manage and regulate the use of the electromagnetic spectrum that exists across sovereign Indigenous lands (Blackwater et al., 2022). Spectrum sovereignty is based on the recognition that Indigenous Peoples have unique knowledge and cultural practices that are closely tied to the land, and that the extraction of raw materials for the development and continued use of digital technologies can have significant impacts on Indigenous environments, cultural practices and on the health of Indigenous communities. As such, spectrum sovereignty is a component of IDSov and Indigenous rights more broadly.

Principles of spectrum sovereignty also extend to blockchain technology, as the decentralized nature of blockchain networks requires a certain level of spectrum control for proper functioning. Blockchain and some of the newer technologies found building WEB 3.0 have vast implications for Indigenous Peoples’ sovereignty. However, Mackey et al. (2022) noted that there are at least three areas where blockchain technology fills these voids in Tribal genetic research governance. They include: 1. Individual and collective data ownership, access, and privileges; 2. Establishing rules, roles, and responsibilities that govern systems; and, 3. Enabling community engagement and data management for community consensus for validations. Through blockchain ledgers and smart contracts, principles of traditional knowledge and IDSov can be built straight into digital programming. If and when Tribes can incorporate using some of these newer technologies they will be capable of an extra layer of protection within the digital realm and potentially from any AI that may act as a threat to a Nation’s spectrum sovereignty, including as an Indigenous data thief or spy (Lewis et al., 2020; Mackey et al., 2022).

There have been reports of Bitcoin owners using cryptocurrency to purchase Indigenous lands, leading to concerns about the facilitation of land grabs (Clarke, 2022). This financial colonial trend raises serious ethical, legal, and social implications for Indigenous Peoples' rights to land and self-determination (Glancy, 2022; Ongweso, 2021). The use of cryptocurrency and blockchain technology in this manner highlights the need for greater transparency and accountability in the emerging digital economy. It is crucial to ensure that Indigenous Peoples' rights are respected in the development and use of these technologies and to involve Indigenous communities in the design and implementation of regulatory frameworks to protect their lands, resources, and cultures. It is also important to recognize and support the sovereignty of

Indigenous Nations and their right to control and manage their lands and resources free from blockchain land grabs.

Moreover, it is necessary to consider the locations of future data centers, especially in consideration of climate change shifts to water-stressed regions (Siddik et al., 2021). The environmental footprints of data centers are disproportionately impacting water-stressed areas in the U.S. Southwest, where a large percentage of Tribal Nations live. Thus, it is vital to consider the locations of future data centers through the lens of Indigenous Sovereignty ensuring their development does not violate Indigenous Peoples' right to free, prior and informed consent.

To realize its commitments to Spectrum Sovereignty, the Global Digital Compact should:

- Recognize and respect Indigenous Peoples' rights to spectrum sovereignty that exist across their sovereign lands and waters, including in digital spaces and emerging metaverses.
- Incorporate principles of IDSov and IDGov into digital programming through blockchain ledgers and smart contracts.
- Encourage governments to assign unused wireless spectrum to Indigenous communities
- Ensure greater transparency and accountability in the emerging digital economy, involving Indigenous communities in the design and implementation of regulatory frameworks to protect their lands, resources, and cultures.
- Recognize and support the sovereignty of Indigenous Nations and their right to control and manage their lands and resources free from blockchain land grabs.
- Consider the locations of future data centers through the lens of Indigenous Sovereignty, especially in water-stressed regions where increasing digital infrastructure development without free, prior, and informed consent threatens Indigenous water health and security.

Summary

The importance of recognizing the collective effort needed for change and prioritizing equity, particularly in partnership with Indigenous Peoples and communities, cannot be overstated. Ultimately, the **Global Digital Compact** must not only be inclusive of but must prioritize equity, especially in partnership with Indigenous Peoples and communities, which can be actualized through the recognition of Indigenous Data Sovereignty and prioritization and integration of the CARE Principles for Indigenous Data Governance.

In this submission we present recommendations for the Global Digital Compact to achieve its commitments related to Internet connectivity, Internet fragmentation, data protection, human rights online, accountability criteria for discrimination and misleading content, regulation of artificial intelligence, and digital commons as a public good. These recommendations emphasize the importance of acknowledging and incorporating Indigenous rights, perspectives and concerns in the development and governance of digital systems. We recommend investing in infrastructure development, increasing funding and resources for Indigenous schools and educational institutions, protecting the rights of Indigenous Peoples' in the digital space, establishing Indigenous Data Sovereignty as a right to govern, steward, and control our own data, and ensuring that AI systems are designed and used in ways that respect the cultural and linguistic diversity of Indigenous Peoples. Additionally, the submission highlights the importance of prioritizing the development of culturally appropriate data governance frameworks and ensuring that Indigenous Peoples and communities have a say in how digital commons are defined, created, accessed, and used.

If you wish to support this initiative, please register your endorsement to IndigenousGDC@gmail.com, or sign up here (<https://forms.gle/ek46ZngrJVsz51B9>)

You may find more information on the [Global Indigenous Data Alliance webpage](https://www.gida-global.org/) (<https://www.gida-global.org/>).

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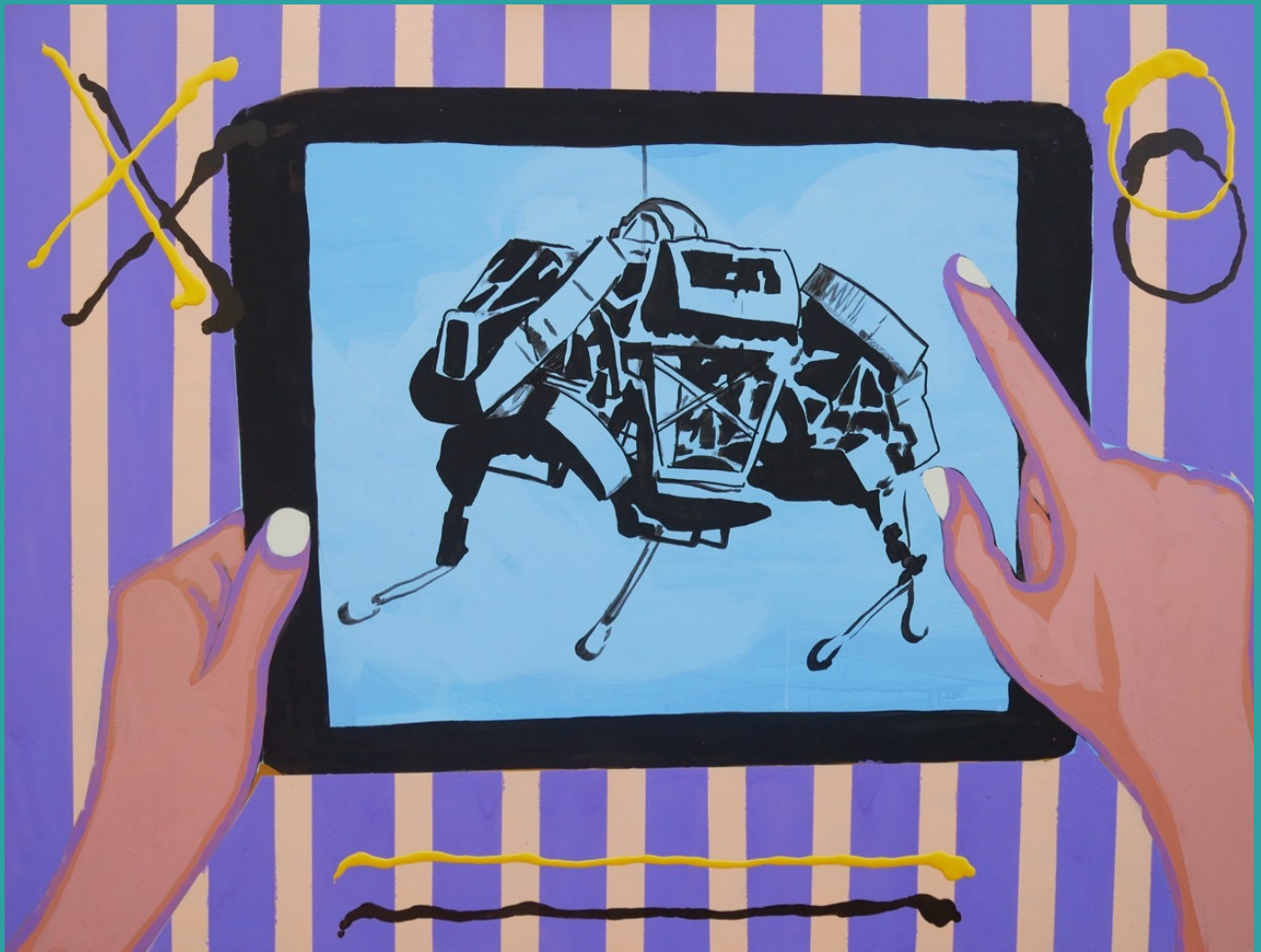
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