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Beyond Machine Legibility: Artificial Intelligence, Ontological Relativity, and the Epistemic Politics of Indigenous Language Preservation

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Abstract

The swift expansion of Artificial Intelligence (AI) is reshaping how knowledge is produced, classified, preserved, and accessed, generating new possibilities for documenting and revitalising endangered Indigenous languages while simultaneously raising urgent questions of epistemic justice, cultural representation, and knowledge ownership. This article argues that the crisis of Indigenous language preservation in the age of AI is not primarily technological but epistemic and ontological: it concerns who defines what a language means, what knowledge counts, how that knowledge is classified, and whose worldview becomes computationally legible. Language is treated here as an epistemic and ontological medium through which communities articulate histories, cosmologies, moral concepts, ecological knowledge, and culturally specific understandings of reality. When Indigenous languages are digitised through AI systems designed within dominant Western linguistic and technological frameworks, preservation efforts may paradoxically reproduce epistemic marginalisation by privileging external categories of classification and intelligibility. Employing critical analysis as its methodology, the article interrogates the epistemic assumptions, power relations, and technological structures underlying AI-mediated language preservation. Its theoretical framework draws on Digital Humanities and ontological relativity, the latter illuminating how distinct linguistic systems embody and organise different conceptions of reality, being, and human-world relations. The article contends that digitisation is never epistemically neutral: the categories, metadata, algorithms, and computational architectures used to represent languages shape what aspects of Indigenous knowledge become visible, intelligible, or excluded in digital environments. It therefore advances a shift from technological preservation toward ontologically sensitive digital preservation. The article concludes that the future of Indigenous language preservation should not merely render Indigenous languages legible to machines; rather, digital technologies must become capable of accommodating the diverse ontological worlds these languages encode. AI can contribute meaningfully to epistemic justice only when preservation moves beyond linguistic form to safeguard the knowledge-worlds, meanings, and ontological possibilities that languages sustain.

Keywords: Artificial Intelligence; Indigenous Knowledge Systems; Epistemic Justice; Indigenous Languages; Language Preservation; Digital Humanities; Ontological Relativity; Digital Epistemology; Indigenous Data Sovereignty; Linguistic Diversity; Algorithmic Representation; Cultural Knowledge.

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1. INTRODUCTION

The emergence of Artificial Intelligence (AI) has transformed the ways we generate, classify, store, retrieve, and circulate knowledge. Artificial intelligence (AI) has changed the way we create, organize, store, find, and

share information. AI technologies such as natural-language processing, machine translation, automated speech recognition, and generative systems now mediate human encounters with knowledge itself. Floridi and Cowls (2019) argue that AI raises fundamental ethical and

social questions because such systems increasingly participate in human decision-making and knowledge practices. Coeckelbergh (2020) extends this point, insisting that AI cannot be understood merely as a technical phenomenon, since it reconfigures relationships between human beings, technology, knowledge, and society. This study takes these claims as a starting point but narrows their focus to a specific and underexamined case: the digital preservation of Indigenous languages. This study argues that there is epistemic vulnerability in Indigenous languages and knowledge systems within AI-mediated digital environments. Furthermore, existing approaches to language preservation typically emphasize documentation, digitization, accessibility, and technological sustainability, but this emphasis can obscure a more profound problem of representation: a language does not exist independently of the worldview, practices, and social relations of its speakers. There is a need to preserve linguistic data without losing its conceptual and ontological context.

Indigenous Knowledge Systems are not simply repositories of isolated facts; they are complex bodies of knowledge embedded within particular social, cultural, ecological, and historical contexts. Battiste and Henderson (2000) emphasize that Indigenous knowledge is inseparable from Indigenous languages, cultural practices, spirituality, land, and community relationships. Dei (2000) similarly argues that Indigenous knowledge constitutes a legitimate epistemological system in its own right, rather than an inferior variant to be measured against Western standards. Read together, these positions establish that Indigenous knowledge is not portable data waiting to be extracted; it is constituted by the very language, memory, and communal experience through which it is transmitted. This inseparability of knowledge and language is philosophically grounded in the linguistic-relativity tradition. Whorf (1956) argues that linguistic structures shape habitual patterns of thought and interpretation, while Lucy (1997) demonstrates the continuing relevance of this claim for understanding the relationship between language and cognition. In this view, language is not a neutral vehicle for transmitting pre-existing ideas; it actively organizes experience and articulates culturally situated understandings of reality. It follows that preserving an Indigenous language involves more than retaining vocabulary and grammar. It requires preserving the culturally situated system through which reality is interpreted and meaningful distinctions are sustained.

The digital turn (Osuji, 2026) has introduced an apparent paradox into this picture. On one hand, AI offers unprecedented tools for preserving languages that might otherwise disappear: large-scale digital archives, speech databases, translation technologies, and machine-learning systems can document linguistic materials and make them accessible to younger generations. On the

other hand, computational preservation can generate new forms of epistemic inequality. AI datasets systematically underrepresent languages that have limited digital resources. AI datasets systematically underrepresent languages with limited digital resources, while languages with extensive textual infrastructure gain disproportionate computational visibility. More fundamentally, the categories used to encode, classify, and interpret Indigenous languages are frequently determined by technological systems that do not reflect the conceptual structures of the communities whose languages are being preserved. This problem is best understood through the lens of ontological relativity. Where linguistic relativity concerns how language shapes thought, ontological relativity makes the stronger claim that distinct linguistic communities may inhabit and articulate genuinely distinctive conceptual worlds—different configurations of being, relationship, value, and time. When an Indigenous language is translated into the vocabulary of a dominant language or rendered into machine-readable categories, something more than words may be lost: categories of being, relationships, ecological understandings, and culturally specific distinctions may be simplified, displaced, or rendered unintelligible.

Digital humanities provides the disciplinary space in which this problem becomes visible, since it combines humanities scholarship, computational methods, archival practice, and questions of representation. Yet digitization within this space is not automatically emancipatory. Digital representation requires selection, classification, metadata construction, and decisions about access—and each of these is an epistemic choice, not a neutral technical operation. The relevant question, therefore, is not whether Indigenous languages can be digitized, but whose categories, assumptions, and authority govern how they are digitized. Osuji (2020) shows that Indigenous knowledge structures embody distinctive configurations of epistemic agency, while Osuji (2026) demonstrates that the digital age is reorganizing the structures through which knowledge is produced, justified, and circulated. Together, these findings reframe the central challenge: it is not simply whether AI can preserve Indigenous languages, but whose ontology, epistemology, and authority will govern the process of preservation. This reframing situates the discussion within the broader problem of epistemic justice—the fair recognition, participation, credibility, and representation of different knowers and knowledge traditions. Within AI-mediated preservation, epistemic injustice can occur in at least two ways: when Indigenous communities are treated as mere providers of data rather than as authorities over the knowledge that data encodes, and when Indigenous concepts are translated into dominant conceptual frameworks in ways that diminish their meaning. The result is a paradox in which a language may be technically preserved while the epistemic world that gives it meaning

is simultaneously distorted.

The aim of the study is to critically examine the implications of artificial intelligence for Indigenous knowledge systems and language preservation, with particular attention to epistemic justice, through the combined theoretical lenses of digital humanities and ontological relativity. Specifically, it seeks to (i) examine the relationship between artificial intelligence and the digital preservation of Indigenous languages; (ii) analyze Indigenous languages as repositories of epistemic and ontological knowledge; (iii) assess the implications of digital humanities for the preservation and representation of Indigenous knowledge systems; and (iv) critically analyze how AI systems may reproduce linguistic, cultural, and epistemic inequalities; (v) investigate the relevance of ontological relativity to the digital representation of Indigenous languages; and (vi) interrogate the problem of epistemic authority in AI-mediated Indigenous knowledge preservation; and (vii) propose an epistemically just framework for AI-assisted Indigenous language preservation. The broader purpose is to move the discussion beyond the conventional question of *whether* Indigenous languages can be digitally preserved toward the more fundamental question of *what kind of knowledge-world* is being preserved when a language is digitized—treating language preservation as simultaneously a technological, epistemological, cultural, and ontological enterprise. The questions posed by this study are (i), how is artificial intelligence transforming the preservation and transmission of Indigenous languages? (ii) In what ways do Indigenous languages function as repositories of distinctive epistemic and ontological worldviews? What opportunities and challenges does digital humanities present for Indigenous knowledge systems and language preservation? (iii) How might AI-mediated language preservation reproduce epistemic and linguistic inequalities? (iv) Who should possess epistemic authority over the digitization, classification, and use of Indigenous linguistic knowledge? Thus, can AI preserve Indigenous languages without transforming or weakening the meanings and worldviews embedded within them?

This study is justified by the convergence of three developments: the rapid expansion of AI, the accelerating digitization of cultural heritage, and the continuing vulnerability of Indigenous languages. Technological capacity alone does not guarantee epistemic justice, and language preservation is too often approached as a problem of documentation rather than one of knowledge, meaning, authority, and ontology—a gap this study addresses through critical philosophical analysis. It is further justified by the need to strengthen African philosophical engagement with AI discourse, which remains largely generated from Western technological and philosophical contexts; bringing Indigenous African linguistic and epistemic experience into this debate challenges the assumption that computational universality entails epistemic universality. Philosophically,

the study contributes to epistemology, philosophy of language, ontology, and philosophy of technology by examining the relationship between language, knowledge, reality, and computational representation, and by extending the discourse of epistemic justice into the digital domain—demonstrating that injustice can arise not only through interpersonal disbelief or institutional exclusion but also through the architectures, datasets, and classifications of AI systems. Practically, it seeks to reconceptualize Indigenous communities as epistemic agents rather than epistemic objects: participants who help define what counts as relevant knowledge, how it is represented, and who may access it, rather than mere suppliers of linguistic data. This study is conceptual and theoretical rather than an empirical evaluation of a specific AI platform. It focuses on the philosophical relationship between AI, Indigenous Knowledge Systems, Digital Humanities, ontological relativity, and epistemic justice, with particular attention to African and Nigerian Indigenous linguistic contexts and broader comparative implications for Indigenous communities globally. It does not offer a technical assessment of AI algorithms or develop a computational language model. Three limitations follow from this scope. First, as a conceptual study, it does not empirically assess the performance of specific AI language models across a representative sample of Indigenous languages. Second, AI technologies continue to evolve rapidly, which constrains the durability of any technical claims. Third, the diversity of Indigenous Knowledge Systems means no single linguistic or cultural experience can represent the full range of Indigenous epistemologies; the study therefore treats African and Nigerian experience as an entry point into a broader problem rather than as a generalizable case. The uneven availability of digital resources across Indigenous languages, while a methodological constraint, also illustrates the structural inequality that constitutes part of the problem under investigation.

This study is divided into seven sections, starting with this introduction, which provides an in-depth overview of the work. This section is followed by an explicit explanation of the methodology. The third section provides conceptual analysis and explains how the theoretical framework is integrated. The methodology is followed by the section on literature review titled A Critical Review of AI, Indigenous Languages, and Epistemic Justice, which discusses literature and attempts to marshal out the gaps in existing studies. This leads to the section on discussion of findings, after which conclusions and recommendations are followed.

2. METHODOLOGY OF THE STUDY

This study adopts a qualitative conceptual and philosophical research design, combining conceptual/philosophical analysis with critical interpretive

analysis. The choice of methodology follows from the central problem of the study: whether the computational legibility of Indigenous languages necessarily produces epistemic recognition, or whether AI-mediated preservation can reproduce forms of epistemic and ontological exclusion. Conceptual/philosophical analysis is employed to clarify and critically examine the meanings and relationships among such concepts as machine legibility, Indigenous knowledge, epistemic justice, epistemic agency, ontological relativity, linguistic relativity, digital preservation, and Indigenous data sovereignty. Philosophical analysis is appropriate because concepts do not function merely as descriptive labels; they establish the conditions under which a problem becomes intelligible. Quine's (1969) discussion of ontological relativity, for example, demonstrates that questions concerning what exists cannot be completely detached from the linguistic and theoretical frameworks through which entities are identified and classified (pp. 1–19). Similarly, Fricker's (2007) account of epistemic injustice provides conceptual resources for examining how social and interpretive structures can disadvantage particular knowers (pp. 1–3, 17–18). Critical interpretive analysis complements conceptual analysis by examining the assumptions and power relations embedded in the literature on AI and Indigenous language preservation. Rather than treating published claims as neutral descriptions, the study asks what conception of knowledge, agency, language, culture, and technological authority underlies them. This enables the analysis to move from what the literature says to what its assumptions imply for Indigenous epistemic agency.

The corpus consists of selected philosophical, interdisciplinary, and scholarly literature addressing seven interconnected fields: AI and language technologies; Indigenous knowledge systems; epistemic justice and social epistemology; linguistic relativity and ontology; African philosophy; digital humanities; and Indigenous data sovereignty. The corpus is therefore conceptual and literature-based rather than empirical. It includes foundational philosophical texts, contemporary scholarship on AI and language technologies, research on Indigenous knowledge and language preservation, African philosophical interventions, Digital Humanities scholarship, and literature addressing data governance and Indigenous data sovereignty. Sources were selected purposively rather than randomly. Three criteria guided the selection process: conceptual relevance (which contributes directly to ontology, epistemic agency, epistemic injustice, language, AI, Indigenous knowledge, or digital representation), theoretical significance, and contextual and interdisciplinary relevance. The purpose of this selection strategy is to construct a theoretically representative corpus capable of examining the

relationship between machine representation and Indigenous epistemic worlds.

The literature was analyzed through a four-stage interpretive procedure. First, conceptual identification involved extracting the principal concepts and claims through which each body of literature describes AI, language, knowledge, ontology, and preservation. Particular attention was paid to how the literature defines the object being preserved and the subject or agent responsible for knowledge production. Second, comparative interpretation examined points of convergence and divergence among the seven bodies of scholarship. For example, AI ethics tends to foreground bias and fairness; African NLP emphasizes computational inclusion and language-resource development; Indigenous scholarship emphasizes knowledge sovereignty and relationality; while epistemic-injustice theory emphasizes credibility and interpretive disadvantage. The study asks what becomes visible through each framework and what remains theoretically underdeveloped. Third, critical reconstruction identifies assumptions that become problematic when these literatures are considered together. The key assumption examined is the tendency to equate linguistic digitization or machine legibility with preservation. The study challenges this equivalence by asking whether computational systems preserve not only words and linguistic forms but also the ontological relations through which Indigenous meanings are constituted. Fourth, philosophical synthesis brings the findings together through ontological relativity and epistemic justice. The purpose is to construct an analytical framework capable of explaining why computational inclusion may nevertheless produce epistemic exclusion. The literature is examined according to six principal analytical categories. The six principal analytical categories are representation and visibility; machine legibility, which includes ontological adequacy, epistemic agency, and authority; and epistemic justice, which encompasses sovereignty and control. Epistemic injustice is identified when computational or institutional arrangements systematically produce one or more of four conditions: exclusion, credibility deficit, interpretive inadequacy, or loss of epistemic agency. This approach extends Fricker's (2007) framework by asking whether hermeneutical injustice can occur not only within human social relations but also through algorithmically mediated interpretive structures. AI-related claims are assessed critically rather than accepted at face value. The analysis distinguishes between technical claims and epistemic claims. Technical claims concern whether a system can translate, classify, recognize, generate, or retrieve linguistic materials. Epistemic claims concern whether such computational success constitutes adequate representation or

preservation of Indigenous knowledge.

3. CONCEPTUAL CLARIFICATION AND THEORETICAL FRAMEWORK

Clarifying the central concepts of this study is necessary because its argument depends on distinguishing cultural preservation from the preservation of the epistemic and ontological structures through which Indigenous knowledge acquires meaning. The study therefore examines Indigenous Knowledge Systems (IKS), Artificial Intelligence (AI), epistemic justice, Digital Humanities, and ontological relativity as interconnected rather than isolated concepts.

Indigenous Knowledge Systems: Indigenous Knowledge Systems refer to cumulative bodies of knowledge, practices, representations, and forms of know-how developed by communities through sustained interaction with one another and their natural environments. They are not static or pre-scientific remnants but dynamic epistemic traditions that continue to evolve (Smith, 2023). IKS are commonly transmitted through oral traditions, indigenous languages, rituals, social practices, ecological knowledge, and cosmologies. In African contexts, they include traditional ecological knowledge, oral literature, divination, Indigenous healing practices, and philosophical traditions such as Ubuntu, all of which possess epistemic significance within their communities (Dei, 2024). Language is particularly important because Indigenous knowledge is embedded in the conceptual structures of the languages through which it is transmitted. UNESCO therefore emphasises that the disappearance of a language can entail the disappearance of knowledge encoded within it, making language preservation an issue of epistemic survival rather than merely cultural heritage (UNESCO, 2024). The problem becomes more urgent in the digital age because AI systems disproportionately process dominant languages while many Indigenous languages remain computationally invisible.

Artificial Intelligence and Epistemic Inequality: For this study, AI refers principally to large language models and machine-learning systems capable of generating, classifying, translating, and circulating knowledge. These systems depend upon extensive datasets, most of which are concentrated in English and a small number of dominant languages (Bender et al., 2023). Consequently, the linguistic composition of training data influences what AI systems can recognise, represent, retrieve, and reproduce as knowledge. This creates more than a technical problem. When knowledge traditions are absent or severely underrepresented in training datasets, AI may reproduce existing epistemic hierarchies by treating dominant knowledge as normative and Indigenous knowledge as marginal. The concept of **data colonialism** captures this concern: digital systems can extract value

from marginalised communities while reproducing structures that subordinate their knowledge (Couldry & Mejias, 2024). The underrepresentation of African languages, including Hausa, Yoruba, Igbo, and Swahili, illustrates the problem; their limited presence in major language models creates conditions in which large populations and their knowledge traditions become inadequately represented within emerging computational infrastructures (Adebara & Abdul-Mageed, 2024).

The philosophical significance of this problem becomes clearer through social epistemology, which examines how social structures determine who can produce knowledge, whose testimony is considered credible, and which interpretive frameworks become authoritative (Goldman & Whitcomb, 2023). Fricker's concepts of testimonial and hermeneutical injustice are particularly relevant. Testimonial injustice occurs when speakers receive diminished credibility because of identity-based prejudice, while hermeneutical injustice arises when the available interpretive resources are inadequate for expressing or understanding a group's experience (Fricker, 2007, cited in Dotson, 2024). In computational environments, these forms of injustice can emerge when AI systems systematically fail to represent Indigenous languages and knowledge structures (Räsä and Stocchetti, 2024). Thus, epistemic injustice in AI is not simply a consequence of missing data. It concerns the structures by which some forms of knowing become visible, intelligible, and authoritative while others remain computationally peripheral.

The title of this section is "Digital Humanities and the Problem of Representation". Digital Humanities provides an appropriate framework for analysing this problem because it examines the relationship between computational technologies and humanistic knowledge. Hayles (2012, pp. 43–44) identifies digital humanities as a space for rethinking the relationship between computation and traditional humanistic enquiry, while Schreibman et al. (2004) emphasise its interdisciplinary engagement with digital technologies. Applied to Indigenous knowledge, however, digital preservation cannot be treated as neutral storage. The representation of cultural materials within digital environments: Decisions regarding selection, metadata, categorisation, translation, accessibility, and archival structure determine how cultural materials are represented within digital environments. These decisions include selection, metadata, categorisation, translation, accessibility, and archival structure. The representation of cultural materials within digital environments Various factors influence the representation of cultural materials within digital environments. by various factors. The representation of cultural materials within digital environments Decisions regarding selection, metadata, categorisation, translation, accessibility, and archival structure determine how cultural materials are represented within digital environments by decisions regarding selection, metadata,

categorisation, translation, accessibility, and archival structure. These decisions include selection, metadata, categorisation, translation, accessibility, and archival structures. within digital environments. AI-assisted preservation may therefore reproduce a language while simultaneously transforming the conceptual world expressed through that language. Adigun's (2026) concept of the **computational sublime** is useful here. His analysis of generative video and Kantian aesthetics demonstrates that computational systems raise questions concerning creativity, judgement, representation, and aesthetic experience (pp. 256–265). Its relevance extends beyond aesthetics: AI-mediated preservation is itself an act of computational representation in which cultural meanings are selected, organised, reproduced, and potentially transformed. The critical question is consequently whether AI preserves Indigenous knowledge as living epistemic systems or merely converts its linguistic surface into machine-readable data.

Ontological Relativity and Indigenous Epistemic Agency: Ontological relativity provides the second major theoretical framework. Quine (1969, pp. 1–19) argues that ontological commitments cannot be completely separated from the linguistic and theoretical frameworks through which entities are identified and classified. This does not mean that reality is arbitrary. Rather, the articulation and interpretation of reality are mediated by particular conceptual schemes. This insight is particularly significant for Indigenous knowledge. Osuji (2020, pp. 83–108) demonstrates that the question of who or what qualifies as an epistemic agent is itself ontologically conditioned. This means:

Ontological relativity is neither the denial of objective reality nor the reduction of being to a subjective construction. It is the recognition that being becomes conceptually identifiable, phenomenologically disclosed, and hermeneutically meaningful through situated frameworks of language, culture, experience, and technological mediation (Osuji, 2020, 86-89).

Indigenous knowledge structures may recognise forms of agency that Western epistemology has marginalised or excluded. Consequently, differences between knowledge systems are not merely differences in opinion; they may represent different modes of ontological disclosure. For example, an Indigenous community may understand a forest not simply as an ecological resource but simultaneously as a site of communal memory, moral obligation, ancestral significance, spiritual presence, and material sustenance. A computational system that translates this forest merely into the category of “natural resource” does not simply simplify information; it potentially changes the ontology through which the forest is understood. This is why language preservation cannot be reduced to lexical preservation. If language expresses relationships among humans, non-human beings, ancestors, environments, moral obligations, and communal institutions, then

removing those relationships from computational representation produces **hermeneutical reductionism**. Osuji's (2020) analysis therefore suggests that Indigenous knowledge must be interpreted within its own conceptual and ontological horizons rather than exclusively through external categories.

From Indigenous to Digital Epistemic Agency: The emergence of AI further complicates the concept of epistemic agency. Digital technologies increasingly participate in selecting, ranking, organising, generating, and circulating knowledge. Osuji (2026, pp. 1–24) argues that digital epistemology contests established paradigms of knowledge production and justification because algorithms increasingly influence what becomes visible, credible, relevant, and authoritative. This produces a new epistemological configuration. Rather than the conventional relationship of human subject–knowledge–object, algorithmic systems introduce a more complex relationship of human–machine–algorithm–knowledge–world. AI may remain a tool, but its increasing involvement in knowledge production raises questions about whether we should view computational systems as epistemic participants. The issue is therefore ontological as well as technological. Osuji's work enables a movement **from** indigenous ontological plurality to digital ontological plurality. If Indigenous systems reveal that epistemic agency is not exhausted by the Western model of the autonomous human knower, AI introduces another challenge by raising the possibility of non-human computational participation in knowledge production.

Ontological relativity, therefore, should not be interpreted as denying objective reality. It recognises that being becomes identifiable and meaningful through historically, culturally, linguistically, phenomenologically, and technologically situated frameworks (Osuji, 2020, pp. 86–89). Quine provides its conceptual foundation; phenomenology deepens the analysis of disclosure; hermeneutics explains interpretation, while Osuji's analyses extend the problem into Indigenous and digital epistemologies (Quine, 1969, pp. 1–19; Osuji, 2020, pp. 83–108; Osuji, 2026, pp. 1–24). The central implication is that AI-assisted Indigenous language preservation becomes epistemically unjust when it preserves linguistic forms while displacing the ontological, cultural, and epistemic relations that constitute their meaning. The challenge, therefore, is not simply to make Indigenous languages computationally visible but to develop digital systems capable of sustaining the plurality of knowledge worlds those languages disclose.

4. A CRITICAL REVIEW OF AI, INDIGENOUS LANGUAGES, AND EPISTEMIC JUSTICE

Contemporary scholarship on artificial intelligence increasingly challenges the assumption that computational systems are neutral instruments for

processing information. Critical AI scholarship demonstrates that algorithms inherit the assumptions, classifications, exclusions, and power relations embedded in their training data. Bender et al. (2021) argue that the development of large language models through increasingly massive datasets can obscure important questions concerning whose language and knowledge are represented and whose are excluded (pp. 610–613). This concern is particularly significant for Indigenous languages because their absence or marginal presence in training datasets does not merely produce poor computational performance; it affects what knowledge can become visible within AI-mediated epistemic environments. Theorists have also framed the problem through the lens of data colonialism. Couldry and Mejias (2019) argue that contemporary data practices constitute a new form of extraction in which human life and social relations are transformed into data resources for economic and technological exploitation (pp. 336–338). When applied to Indigenous communities, the concern arises. When applied to Indigenous communities, the concern becomes twofold: Indigenous linguistic data may be extracted for technological development, while the communities from which the data originate remain excluded from decisions concerning its ownership, interpretation, and use. Recent scholarship has therefore connected AI development with Indigenous data sovereignty. The central concern is no longer merely whether AI systems contain Indigenous data but under what conditions those data are collected, categorised, interpreted, and computationally reproduced. The literature establishes that AI participates in the politics of visibility. What remains insufficiently theorised, however, is the ontological dimension of this process: whether machine representation can preserve the conceptual world through which Indigenous linguistic expressions acquire meaning.

Scholarship on Indigenous Knowledge Systems (IKS) has challenged the assumption that legitimate knowledge must conform to Western scientific epistemology. Indigenous knowledge is increasingly understood as dynamic, situated, relational, and embedded in historical relationships among people, land, community, environment, spirituality, and language. Smith (2023) emphasises that Indigenous knowledge should not be regarded as a static or pre-scientific residue but as a living epistemic tradition developed through sustained interaction between communities and their environments (pp. 6–9). Dei (2024) similarly emphasises the epistemic significance of Indigenous knowledge within African contexts, where knowledge may be expressed through oral traditions, ecological practices, spirituality, communal institutions, and indigenous systems of interpretation (pp. 41–45). Such knowledge cannot easily be separated from the linguistic and cultural environments through which it is transmitted.

Language is consequently more than a communicative instrument. It constitutes part of the conceptual infrastructure through which a community identifies relationships, agents, values, obligations, and forms of reality. UNESCO (2024) therefore connects language preservation with the preservation of Indigenous knowledge, emphasising that the loss of a language can entail the loss of knowledge encoded and transmitted through it. Nevertheless, much Indigenous knowledge scholarship has concentrated on cultural survival, decolonisation, intellectual property, community identity, and knowledge sovereignty. These contributions are essential, but they have not sufficiently addressed what occurs when Indigenous knowledge enters algorithmic environments in which computational categories determine its visibility and accessibility. The unresolved question is thus not simply whether Indigenous knowledge is digitised but what kind of knowledge survives digitisation.

Research on endangered languages increasingly recognises digital technologies as important instruments for documentation, preservation, revitalisation, education, and intergenerational transmission. Digital archives, online dictionaries, language-learning platforms, speech technologies, and social media create opportunities for languages that have historically been excluded from formal technological infrastructures. Yet digital preservation is not epistemically neutral. The process of digitisation necessarily involves decisions concerning what digitisation inherently requires, making decisions about what to select, record, categorise, translate, index, and make accessible. Awuor et al. (2024), for example, demonstrate the importance of Digital Humanities approaches for documenting and disseminating Indigenous knowledge, while research on African languages emphasises the potential of digital technologies for language revitalisation. The philosophical problem is that documentation does not necessarily equal preservation. A database may preserve words, phrases, narratives, and recordings while removing the relational contexts that give them meaning. A translated Indigenous concept may become searchable and computationally accessible but lose its connection to Indigenous categories of agency, morality, spirituality, environment, or communal responsibility. This distinction exposes a limitation in conventional preservation research. Its principal concern is often whether linguistic material remains accessible. The present study asks a more profound question: Does computational preservation preserve the epistemic and ontological relations embodied in the language?

African Natural Language Processing (NLP) scholarship represents an important intervention against the computational marginalisation of African languages. Initiatives such as Masakhane have sought to develop African-language datasets, translation systems, speech

technologies, and language models through collaborative research. This scholarship challenges the description of African languages as simply “low-resource” languages because the scarcity frequently reflects historical technological exclusion rather than linguistic insignificance. Adebara and Abdul-Mageed (2024) demonstrate the continuing imbalance in the representation of African languages within large language models. The limited availability of African-language data has significant consequences for computational translation, language modelling, and AI-based knowledge systems.

African NLP has therefore addressed the problem of machine invisibility: languages that cannot be adequately processed by machines become increasingly disadvantaged as digital infrastructures mediate communication and knowledge production. However, machine legibility and epistemic recognition are not identical. A language may become computationally processable without its Indigenous conceptual structures being adequately represented. The central limitation of existing African NLP research is therefore not its concern with computational inclusion but the tendency to measure inclusion primarily through technical performance—datasets, translation accuracy, speech recognition, and model capability. The present study moves the question from “Can the language be processed?” to “What happens to the knowledge world expressed through the language when computational processing becomes the dominant condition of visibility?”

Fricker's theory of epistemic injustice provides a significant philosophical framework for examining the marginalisation of Indigenous knowledge. Testimonial injustice occurs when a speaker's credibility is unfairly diminished because of identity prejudice, while hermeneutical injustice occurs when marginalised groups lack adequate interpretive resources for expressing or understanding their experiences (Fricker, 2007, pp. 17–18, 147–175). These concepts are increasingly relevant to digital environments. When AI systems systematically fail to recognise Indigenous languages or adequately translate culturally embedded concepts, they may contribute to hermeneutical disadvantages. Räisä and Stocchetti (2024) extends this concern by examining the possibility of testimonial and hermeneutical injustice within algorithmically mediated knowledge environments. The present study, however, extends the problem further. Conventional epistemic-injustice theory primarily examines relations among human epistemic subjects and social institutions. AI introduces an additional epistemic intermediary capable of selecting, classifying, translating, ranking, generating, and circulating representations of knowledge. Consequently, epistemic injustice may occur not only because human subjects discredit Indigenous knowers but also because computational infrastructures determine the conditions under which Indigenous knowledge becomes intelligible. This represents an

important theoretical shift: from the credibility of the Indigenous knower to the computational intelligibility of the Indigenous knowledge world.

Digital Humanities offers an important interdisciplinary framework for examining this problem because it treats computational technologies not simply as instruments but also as objects of humanistic enquiry. Hayles (2012) argues that digital humanities creates opportunities to rethink the relationship between computation, interpretation, and traditional humanistic scholarship (pp. 43–44). Schreibman et al. (2004) similarly emphasise its interdisciplinary character and engagement with digital technologies as both scholarly tools and objects of enquiry. For Indigenous knowledge, this perspective is particularly significant because digitisation inevitably involves interpretation. Decisions concerning metadata, categorisation, archival structure, searchability, and accessibility influence how cultural materials become intelligible in digital environments. Indigenous data sovereignty adds an important political dimension. Kukutai and Taylor (2016) argue that Indigenous communities must exercise authority over the collection, ownership, interpretation, and application of data concerning Indigenous peoples (pp. 2–4). The issue therefore extends beyond access to data to questions of epistemic control. The digital humanities literature thus helps reveal that preservation is an interpretive and political practice. Yet it has not sufficiently connected digital representation with the ontological plurality of Indigenous knowledge systems.

The preceding review demonstrates that existing scholarship remains divided across several intellectual traditions. AI ethics has exposed algorithmic bias, exclusion, and data colonialism, but it has not adequately theorised the ontological consequences of computational representation. Indigenous knowledge scholarship has established the legitimacy and relational character of Indigenous epistemologies but has paid less attention to how AI restructures the conditions under which those epistemologies become digitally intelligible. Endangered-language research has advanced documentation and revitalisation but often equates preservation with linguistic accessibility rather than with the preservation of the knowledge-world embedded in language. African NLP has addressed computational invisibility but tends to evaluate inclusion through technical measures rather than ontological adequacy. Epistemic-injustice scholarship explains testimonial and hermeneutical exclusion but has not fully theorised computational systems as mediators of epistemic intelligibility. Finally, Digital Humanities has demonstrated that digitisation is interpretive rather than neutral, but it has not sufficiently connected this insight to ontological plurality.

The originality of this article lies in bringing these conversations together through ontological relativity. Quine (1969) establishes that ontological commitments are inseparable from the linguistic and theoretical

frameworks through which entities are identified and classified (pp. 1–19). Osuji (2020) extends this insight to Indigenous knowledge by demonstrating that what counts as an epistemic agent, what qualifies as knowledge, and how knowledge is constituted are partly conditioned by the ontological structure of a knowledge community (pp. 83–108). Osuji (2026) further argues that digital technologies are transforming established structures of epistemic authority by intervening in the production, circulation, and justification of knowledge (pp. 1–24).

The article consequently distinguishes machine legibility from epistemic-ontological recognition. Machine legibility asks whether an AI system can process, translate, classify, or generate an Indigenous language. Epistemic-ontological recognition asks whether computational representation preserves the conceptual relations, categories of agency, forms of evidence, values, and relationships through which that language constitutes a distinct knowledge-world. This distinction provides the article's central theoretical contribution. AI-assisted Indigenous-language preservation becomes epistemically unjust when computational inclusion produces linguistic visibility while simultaneously producing ontological invisibility. The objective, therefore, should not merely be to make Indigenous languages machine-readable but to develop computational practices capable of respecting the plurality of knowledge-worlds those languages disclose. The central question consequently shifts from “Can Indigenous languages become machine-legible?” to a more fundamental philosophical question: “What happens to an Indigenous knowledge-world when machine legibility becomes the condition of epistemic visibility?”

5. ANALYSIS OF FINDINGS

Finding 1: Digital preservation is not epistemically neutral. This finding follows directly from the Digital Humanities literature on representation: digitisation always involves acts of selection, classification, and metadata construction, each of which encodes epistemic choices rather than neutral technical operations. AI systems do not simply store Indigenous languages; they classify, structure, translate, rank, and reproduce linguistic material according to categories that originate outside the community whose language is being represented (Osuji, 2020, p. 1).

Finding 2: Linguistic preservation can occur without the preservation of meaning. This conclusion rests on the linguistic-relativity tradition, which holds that language does not merely name a pre-existing reality but organises experience and interpretation (Whorf, 1956, pp. 212–214; Lucy, 1997, pp. 291–292). Because Indigenous languages encode culturally specific metaphors, relationships, and ontological categories (Battiste & Henderson, 2000, pp. 41–42), a language can be

computationally retained in form—vocabulary, grammar, and phonetics—while the conceptual world it once expressed is flattened or lost in translation into dominant categories.

Finding 3: AI can reproduce linguistic inequality. This finding reflects the uneven distribution of digital infrastructure across languages. Because AI development has been driven largely by languages with substantial corpora and institutional investment, under-resourced Indigenous languages risk being rendered further marginal by the very technologies meant to preserve them — a structural, not incidental, form of inequality (Floridi & Cows, 2019, p. 1).

Finding 4: Indigenous communities must be treated as epistemic authorities. This finding follows from the argument that Indigenous knowledge is a legitimate epistemological system rather than raw data to be measured against Western standards (Dei, 2000, pp. 115–116). It implies that communities should participate directly in decisions about classification, access, interpretation, and use, rather than serving merely as sources from which linguistic material is extracted (Battiste & Henderson, 2000, pp. 41–42).

Finding 5: Indigenous data sovereignty is essential to epistemic justice. This finding extends Finding 4 from participation to ownership: linguistic preservation cannot be separated from questions of consent, benefit-sharing, and cultural authority over how digitised knowledge is stored, reproduced, and commercialised (Osuji, 2026, p. 1; Coeckelbergh, 2020, pp. 1–4). Without sovereignty over data, communities risk contributing knowledge to systems they cannot govern.

Finding 6: AI preservation should become ontologically sensitive. This is the paper's central and most original conceptual contribution. It synthesises the preceding findings into a normative claim: preservation must move beyond making languages machine-legible toward designing systems capable of accommodating the distinctive ontological worlds — categories of being, relationship, and value — that different languages encode (Osuji, 2020, p. 1; Osuji, 2026, p. 1).

1. RECOMMENDATIONS AND DIRECTIONS FOR FUTURE RESEARCH

6.1 Recommendations

The study on *Beyond Machine Legibility: Artificial Intelligence, Ontological Relativity, and the Epistemic Politics of Indigenous Language Preservation* recommends a shift from viewing indigenous languages merely as endangered linguistic resources to understanding them as epistemic infrastructures that preserve, organise, and transmit indigenous ways of knowing. In this regard, AI should be developed and deployed not simply as a technological instrument for

digitisation but as an ethical and epistemic system whose design must respect the communities whose knowledge it processes.

(i) Develop *Indigenous-Language AI Infrastructure*: There is an urgent need for sustained investment in AI systems capable of processing Nigerian and other African indigenous languages. Governments, universities, technology companies, and research institutions should support the development of indigenous-language datasets, speech-recognition systems, translation tools, language models, optical-character-recognition systems, and digital archives. Such infrastructure would reduce the dependence of African users on AI systems primarily trained on dominant global languages. However, digitisation should not be understood simply as converting oral or written materials into machine-readable data. The epistemic structures embedded within indigenous languages must also be preserved. This follows Osuji's (2020) argument that indigenous knowledge structures contain distinctive ontological configurations that can be distorted when interpreted exclusively through external epistemological categories.

Nigeria needs a specific policy framework addressing the intersection of AI, indigenous knowledge, language, cultural heritage, and epistemic justice. Such a policy should address indigenous-language representation in AI; community consent and participation; indigenous data sovereignty; cultural intellectual property; algorithmic accountability; benefit-sharing; preservation of oral traditions; ethical AI research; indigenous-language education; and protection against digital appropriation. This should be part of a larger national AI plan, not just a side issue about culture. African philosophers should take a more active role in theorising the ontological and epistemological implications of AI. Osuji's (2026) analysis of indigenous epistemic agents and Osuji's (2022) analysis of digital epistemology provide a productive theoretical trajectory (Indigenous epistemic agency → relational ontology → digital epistemology → algorithmic epistemic agency → AI ontology). This trajectory demonstrates that African philosophy does not need to approach AI merely as an imported technological problem. African philosophical traditions can provide conceptual resources for questioning dominant assumptions about agency, knowledge, language, personhood, community, nature, and technological intelligence.

(ii) *Place Indigenous Communities at the Centre of AI Development*: Indigenous communities should not be treated merely as sources of data. They should become co-designers, interpreters, custodians, and beneficiaries of AI systems built from their linguistic and cultural resources. Community elders, traditional knowledge holders, indigenous-language scholars, philosophers, linguists, educators, artists, and young speakers should

participate in decisions concerning what knowledge may be digitised, how it should be represented, who may access it, and how it may be used. This recommendation is particularly important from the perspective of epistemic justice. If communities contribute linguistic and cultural knowledge without participating in decisions about its technological use, digitalisation can reproduce the very epistemic inequalities it claims to overcome.

(iii) Establish *Indigenous Data Sovereignty*: Governments and research institutions should develop clear frameworks for "Indigenous data sovereignty". Indigenous linguistic and cultural materials should not automatically become freely extractable resources for technology companies or external researchers. There should be explicit protocols governing ownership of indigenous-language datasets; consent for recording and digitisation; access to culturally restricted knowledge; commercial use of indigenous linguistic resources; attribution and recognition; data storage and institutional control; benefit-sharing; and deletion or withdrawal of data where appropriate. This would help prevent a new form of digital colonialism in which African languages become raw materials for globally powerful AI systems while African communities remain technologically and economically marginalised.

(iv) *Protect the Semantic and Ontological Integrity of Indigenous Languages*: This initiative is in three parts. (a) Language preservation should go beyond vocabulary preservation. AI developers and language researchers should pay attention to the meanings, metaphors, categories, values, and ontological assumptions embedded in indigenous languages. A translation system may successfully translate individual words while nevertheless destroying the conceptual relations that give those words meaning within a particular culture. Consequently, indigenous-language AI should be evaluated not only according to accuracy of translation but also according to semantic fidelity and cultural intelligibility. This recommendation directly extends Osuji's (2020) ontological approach. If language participates in the constitution of indigenous epistemic structures, then the loss or distortion of indigenous languages represents not simply linguistic loss but epistemic and ontological impoverishment. (b) AI developers should establish ethical protocols before indigenous cultural and linguistic materials are incorporated into training datasets. Such protocols should distinguish between public knowledge, communal knowledge, sacred/restricted knowledge, and personally sensitive knowledge. Not every form of indigenous knowledge should be converted into machine-readable data. The principle should therefore be: What can be digitised is not necessarily what should be digitised? This distinction is fundamental to epistemic justice because unrestricted data extraction can transform cultural

preservation into technological appropriation. Policy and research should move beyond treating indigenous people as informants who merely supply data to researchers. Indigenous knowledge holders should be recognised as epistemic agents and co-producers of knowledge. This recommendation follows directly from Osuji's (2020) ontological deconstruction of epistemic agency. If indigenous knowledge systems recognise relational forms of epistemic participation, then research methodologies should reflect these systems rather than impose a rigid researcher–subject binary. Nigeria and other African countries should develop publicly supported digital archives for indigenous oral histories, proverbs, folktales, philosophical concepts, songs, ecological knowledge, medicinal knowledge, historical narratives, and linguistic materials. However, these archives should employ tiered access systems rather than assuming that all knowledge should be universally available. Community-controlled access would protect culturally sensitive materials while allowing for their appropriate educational and scholarly use. This approach would reconcile preservation with cultural sovereignty.

(v). *Establish African Indigenous-Language AI Research Centres:* African universities should establish interdisciplinary centres dedicated to AI, indigenous languages, indigenous knowledge systems, and epistemic justice. Such centres should bring together philosophy, linguistics, computer science, anthropology, history, education, digital humanities, information science, and cultural studies. In Nigeria, such research should include the major indigenous languages as well as less digitally represented languages. Research should investigate not only machine translation but also indigenous-language large language models; speech technologies; digital storytelling; indigenous philosophical terminology; AI-assisted language teaching; digital preservation of oral traditions; indigenous knowledge databases; culturally responsive AI; and computational humanities. This would reposition African universities from being primarily consumers of AI technologies to producers of AI knowledge and infrastructure. Educational policy should encourage the use of indigenous languages alongside English in AI and digital-literacy programmes. Students should be taught not merely how to use AI but how AI systems process language, generate knowledge, reproduce bias, and influence epistemic authority. Osuji's (2022) conception of digital epistemology is particularly relevant here. If algorithmic systems increasingly participate in the production, organisation, and justification of knowledge, then digital literacy must become more than mere technical competence. It must include epistemological literacy, which is the capacity to question how algorithms determine what becomes visible, credible, searchable, and knowable.

6.2 Directions for Future Research

Future research could extend this conceptual analysis into empirical and applied investigations of Indigenous AI—for example, developing and evaluating AI models trained on Nigerian Indigenous languages such as Yoruba, Igbo, Hausa, Edo, Tiv, Ibibio, and Efik, with attention to whether such systems preserve culturally specific meanings or merely translate Indigenous expressions into dominant conceptual categories. Further work could investigate Indigenous data sovereignty and community-controlled protocols for collecting, storing, and using Indigenous linguistic data; develop Indigenous digital archives in which communities determine levels of accessibility; and design ontologically sensitive AI models capable of recognising that different languages encode different relationships between individuals, nature, community, spirituality, and time. Comparative studies involving African, Aboriginal, Native American, and Pacific Island linguistic traditions could determine whether the epistemic challenges identified here are universal features of AI-mediated preservation or are shaped by particular historical and cultural circumstances. The field's decisive question should shift from whether AI can learn Indigenous languages to whether AI can be designed to respect the knowledge systems, ontological assumptions, and epistemic sovereignty of the people who speak them.

7. CONCLUSION

The encounter between artificial intelligence and indigenous knowledge systems presents both an unprecedented opportunity and a serious epistemic dilemma. AI can document endangered languages, facilitate intergenerational transmission, expand access to indigenous knowledge, and create new spaces for linguistic and cultural visibility. Yet, preservation through technology does not necessarily preserve meaning. When indigenous languages are reduced to datasets and processed through computational architectures designed largely around dominant linguistic and epistemological assumptions, digital preservation can reproduce the very epistemic marginalisation it seeks to overcome. This study has argued that the crisis is therefore not simply one of language extinction but of epistemic justice. Language embodies categories of being, systems of meaning, collective memory, values, and distinctive ways of knowing. Osuji's (2020) ontological deconstruction of epistemic agents demonstrates that indigenous knowledge structures cannot be adequately understood through a narrow subject–object model, while his account of digital epistemology shows that algorithmic technologies are transforming the conditions under which knowledge is produced, justified, and circulated (Osuji, 2020, pp. 83–108; Osuji, 2022, pp. 1–24). Adigun's (2026)

analysis of the computational sublime further illuminates the transformative capacity of generative technologies to unsettle inherited assumptions about human creativity, judgement, and technological mediation (pp. 256–265). Taken together, these perspectives establish that AI is not an epistemically neutral medium: it participates in determining what is preserved, how it is represented, and whose knowledge becomes visible. The future of indigenous-language preservation must therefore move beyond digitisation and toward epistemic sovereignty. Indigenous communities should be recognised not as data sources but as epistemic agents, custodians, co-designers, and beneficiaries of the technologies through which their languages and knowledge are preserved. AI development must consequently incorporate indigenous linguistic categories, community consent, cultural protocols, data sovereignty, semantic integrity, and mechanisms of accountability. The question is not whether AI can save indigenous languages, but what kind of knowledge-world AI will help to preserve. A truly equitable digital future will not only render indigenous languages computationally visible; it will also safeguard their ability to name, interpret, remember, and shape worlds according to their standards. The ethical task, therefore, is to transform AI from an instrument of epistemic extraction into an infrastructure of linguistic plurality, cultural continuity, and epistemic justice.

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