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INTEGRATING FUNCTIONAL AND INDIGENOUS PHILOSOPHICAL PERSPECTIVES FOR THE ADVANCEMENT OF ARTIFICIAL INTELLIGENCE

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Abstract

Artificial intelligence (AI) is increasingly influencing education, healthcare, agriculture, public administration, communication, and economic development. Although advances in AI are often assessed through speed, accuracy, automation, and problem-solving capacity, these measures do not by themselves establish whether a system is culturally appropriate, ethically responsible, or beneficial to the people affected by it. This paper examines how functional and indigenous philosophical perspectives can be integrated to support more inclusive and socially responsible AI development. It adopts a conceptual and analytical approach, drawing on contemporary textbooks and scholarly works on AI ethics, African philosophy of technology, philosophy of mind, and indigenous knowledge. Functional perspectives are considered in terms of the purposes, roles, performance, and practical consequences of AI systems, while indigenous philosophical perspectives are examined through community relationships, local knowledge, cultural identity, moral responsibility, and human dignity. The paper argues that integration should connect technical effectiveness with cultural relevance, ethical evaluation, participatory design, and human accountability. Five major challenges are identified: cultural and data bias; inadequate representation of indigenous languages and knowledge; appropriation of community knowledge; limited institutional capacity; and tensions between technological efficiency, cultural values, and individual rights. The paper recommends culturally responsive AI policies, indigenous-language development, interdisciplinary education and research, community participation and knowledge protection, and systematic ethical evaluation with human oversight. It concludes that functional and indigenous philosophical perspectives can complement one another by encouraging AI systems that are capable and reliable while remaining responsive to the social and cultural contexts in which they operate.

Keywords: Artificial intelligence, functional philosophy, indigenous philosophy, African philosophy, ethics, technological advancement.

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INTRODUCTION

Artificial intelligence has become a significant force in contemporary life, shaping how people obtain information, learn, communicate, work, and make decisions. AI systems can classify information, identify patterns, generate language, support predictions, and assist with tasks that previously depended heavily on human judgement. Their applications extend across education, healthcare, agriculture, business, and government. However, the growing influence of AI has also intensified concerns about fairness, privacy, accountability, labour, cultural representation, and the concentration of technological power. Recent work in AI ethics emphasizes that responsible innovation requires attention not only to what systems can do but also to how they affect human beings and society (Boddington, 2023; Floridi, 2023; Shadbolt & Hampson, 2024).

The advancement of AI is therefore both a technical and a philosophical undertaking. Technical research can improve the accuracy, speed, and reliability of computational systems, but philosophy helps examine the purposes for which those systems are designed and the values embedded in their use. Vallor (2024) argues that AI can reflect and amplify existing human habits and limitations rather than automatically producing wiser decisions. Crawford (2021) similarly demonstrates that AI is connected to material resources, human labour, institutional power, and social choices. These arguments challenge the view that technological progress should be measured only by computational performance.

Functional perspectives provide one way to assess AI by examining its operations, intended purposes, inputs, outputs, and contribution to solving defined problems. Functionalism in the philosophy of mind, more specifically, explains mental states through their functional roles within a system rather than identifying them solely with a particular physical substance (Levin, 2023).

In African contexts, discussions of technology increasingly call for the inclusion of African intellectual traditions and local experiences in debates that have often been shaped by dominant global technological centres (Ndasauka, 2024). Recent scholarship on African philosophy of mind and AI also explores how African philosophical concepts can contribute to debates about intelligence, consciousness, and the relationship between human beings and machines (Attoe et al., 2023). Such contributions should not be treated as a single uniform African worldview, since African societies and intellectual traditions are diverse and internally contested.

CONCEPTUAL CLARIFICATION

1. Artificial Intelligence

Artificial intelligence refers broadly to computational systems designed to perform tasks associated with capabilities such as learning, reasoning, prediction, perception, language processing, and decision support. AI is not a single tool but a broad field involving different approaches, models, and applications. Contemporary systems may use machine learning to identify patterns in data, natural language processing to work with human language, and generative models to produce text, images, audio, or other outputs. The practical value of an AI system depends on its design, training data, intended use, and the environment in which it operates (Boddington, 2023; Floridi, 2023).

AI should not automatically be equated with human intelligence or understanding. A system may produce an appropriate answer or complete a task without possessing human experience, consciousness, or moral judgement. Shadbolt and Hampson (2024) argue that AI should be assessed in relation to the social expectations and responsibilities that arise when machines perform tasks that resemble human actions. Vallor (2024) likewise cautions against assuming that powerful machine outputs necessarily represent wisdom or moral progress. These distinctions matter because a system that performs well on a narrow task may still produce misleading, unfair, or culturally inappropriate results in real-world settings.

AI is understood as the design and application of computational systems capable of performing tasks associated with intelligent behaviour in ways that can assist human activity. This definition includes technical capabilities as well as the social and ethical questions arising from their use. It allows AI to be considered not simply as a collection of algorithms but as a technology that is designed, trained, funded, governed, and used within particular social environments.

2. Functional Philosophical Perspectives

Functional philosophical perspectives focus on the roles, purposes, operations, and consequences of systems or practices. In the philosophy of mind, functionalism maintains that mental states are characterized by the roles they play in relation to inputs, other states, and outputs rather than by their material composition alone (Levin, 2023). This theory is relevant to AI because it draws attention to organization and performance, although it does not establish that a machine performing a function necessarily possesses consciousness or human understanding.

In applied AI development, a functional perspective asks what problem a system is intended to solve, how well it performs the task, whether its outputs are reliable, and what consequences follow from its use. For example, an educational AI tool may be evaluated by whether it provides accurate feedback, supports teachers, helps identify learning difficulties, and improves access to learning materials. A public-service system may be assessed by the reliability of its information, accessibility to users, and its contribution to fair and timely service delivery. Such evaluation requires clear objectives and appropriate evidence rather than the assumption that every new technology represents progress.

Functional effectiveness, however, is not sufficient as a complete standard for responsible AI. A system could process applications quickly while unfairly excluding people whose circumstances are poorly represented in its data. It could produce persuasive educational content while presenting errors as facts. Crawford (2021) shows that AI systems are shaped by choices about data, labour, resources, and institutional power, while Boddington (2023) examines how technical questions intersect with ethical and social concerns. A functional approach should therefore be complemented by ethical and cultural criteria that help determine which goals are worthwhile and whose interests are being served.

3. Indigenous Philosophical Perspectives

Indigenous philosophical perspectives are forms of reasoning, knowledge, and ethical understanding that emerge from the historical experiences, languages, social practices, environments, and intellectual traditions of particular peoples. They may be expressed through oral traditions, communal deliberation, practical

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knowledge, cultural practices, and formal philosophical argument. Indigenous perspectives are diverse; they should not be reduced to a single set of beliefs or assumed to be static or free from internal disagreement. Ndasauka (2024) argues for taking African voices and philosophical traditions seriously in discussions of technology, rather than treating technological development as a process in which African societies only adopt ideas produced elsewhere.

Indigenous knowledge may also include accumulated practical understanding of language, agriculture, health practices, ecology, conflict resolution, and community life. Such knowledge should not be treated as automatically correct in every situation, nor should it be dismissed because it was developed outside formal scientific institutions. Instead, it should be considered critically, with attention to evidence, context, community authority, and the rights of knowledge holders. Crawford (2021) highlights the material and political conditions behind AI, while Ndasauka (2024) calls for African philosophical perspectives to shape how technology is understood and governed.

Indigenous philosophical perspectives refer to locally grounded systems of knowledge and moral reflection that can contribute to AI through language, cultural understanding, communal responsibility, practical wisdom, and respect for human dignity. Their inclusion should be based on meaningful engagement with communities and should remain compatible with human rights, individual dignity, and critical inquiry.

4. INTEGRATING FUNCTIONAL AND INDIGENOUS PHILOSOPHICAL PERSPECTIVES FOR THE ADVANCEMENT OF ARTIFICIAL INTELLIGENCE

The integration of functional and indigenous philosophical perspectives requires a oframework that connects technical effectiveness with cultural relevance and ethical responsibility. Functional analysis asks whether an AI system fulfils its intended task, while indigenous perspectives help examine whether that task responds to local priorities and respects the people whose lives may be affected. The two perspectives are complementary rather than interchangeable: technical performance can be measured, but the value and legitimacy of a system also depend on the purposes it serves and the context in which it operates. Recent AI ethics literature emphasizes that responsible systems must be assessed through a combination of technical, ethical, and social considerations (Boddington, 2023; Floridi, 2023).

Technical Effectiveness and Community Welfare

An integrated approach should assess AI through both technical performance and its contribution to community welfare. Accuracy, reliability, speed, accessibility, and consistency remain important because systems that fail technically cannot be relied upon. Yet the assessment should also ask whether the system addresses a genuine need, whether benefits are distributed fairly, and whether its operation creates avoidable harm. Vallor (2024) warns against confusing machine capability with wisdom, while Shadbolt and Hampson (2024) emphasize the importance of evaluating AI in relation to the human responsibilities and social expectations surrounding its use.

In education, an AI platform may provide rapid feedback and recommend learning materials, but it should also support teachers, accommodate students with different learning needs, and avoid excluding learners who have limited connectivity or use underrepresented languages. In agriculture, an AI advisory tool may analyse weather or soil data, but its recommendations should be tested against local conditions and discussed with the farmers who will use them. Combining technical evidence with community experience can improve the relevance of AI without abandoning standards of accuracy and evaluation.

Indigenous Languages and Knowledge Systems

Language is central to communication, identity, and the transmission of knowledge. AI systems trained mainly on widely represented languages may perform poorly for communities whose languages and dialects have limited digital representation. A culturally responsive approach should support the collection and evaluation of high-quality language data, including local vocabulary and context-sensitive expressions, while respecting consent and privacy. Ndasauka (2024) argues that African perspectives should contribute to the shaping of technology, and this includes ensuring that African languages and knowledge are not treated as peripheral to digital innovation.

In Nigeria, AI tools could be developed to support Hausa, Yoruba, Igbo, and other Nigerian languages, including smaller languages where suitable resources and community consent are available. Possible applications include educational translation, agricultural information, public-service communication, and digital preservation of oral histories. Language inclusion must go beyond literal word-for-word translation because proverbs, idioms, humour, and social meanings may not transfer directly between languages. Local speakers, linguists, educators, and cultural experts should therefore participate in data creation and system evaluation.

Communal Responsibility and Ethical AI

An indigenous or communitarian perspective can broaden AI evaluation by asking how systems affect relationships, vulnerable groups, and shared welfare. An automated scholarship system, for example, might process applications efficiently yet disadvantage applicants whose educational histories or circumstances are poorly represented in the data. A responsible assessment should therefore consider fairness, transparency, accessibility, and opportunities for human review. Florida (2023) emphasizes the need to connect AI principles with the practical conditions of responsible development and deployment.

Communal responsibility should not mean that individual rights are sacrificed to collective preferences. A balanced approach recognizes both the social character of human life and the dignity and agency of individuals. AI systems should not reinforce discrimination or deny people meaningful ways to question consequential decisions. A culturally informed framework should therefore combine community consultation with privacy protection, equal treatment, due process, and the possibility of appeal.

Education, Research, and Human Oversight

Education and research can help embed philosophical reflection within AI development. Courses in computer science and AI should include ethical reasoning, African philosophy of technology, digital responsibility, and culturally responsive design. Students should learn to evaluate systems not only by whether they function but also by how their design choices affect different groups. Attoe et al. (2023) demonstrate the value of bringing African philosophical questions into debates about AI and the

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philosophy of mind, while Ndasauka (2024) highlights the importance of African intellectual participation in technological thought.

Interdisciplinary research should bring together computer scientists, philosophers, linguists, educators, social scientists, policymakers, and community knowledge holders. These partnerships can help define relevant problems, identify appropriate data, test systems, and assess social outcomes. Communities should not be treated merely as sources of data; they should be partners in decisions about documentation, access, attribution, and benefit sharing. This is especially important when AI developers seek to use oral histories, culturally restricted information, or collectively held knowledge.

Human oversight remains necessary where AI decisions affect education, healthcare, employment, public services, or fundamental rights. AI can assist with analysis and recommendations, but institutions should retain identifiable responsibility for decisions and provide mechanisms for explanation, review, correction, and redress. Shadbolt and Hampson (2024) argue for considering AI actions in relation to the expectations applied to human conduct, while Floridi (2023) emphasizes the importance of principles that can guide real-world AI governance. The integrated framework proposed here therefore connects technical performance, cultural relevance, ethical responsibility, community participation, and human accountability.

CHALLENGES

1. AI systems can reproduce biases contained in their training data, design assumptions, or institutional settings. When particular languages and communities are underrepresented, systems may misinterpret their needs or produce outcomes that disadvantage them. Crawford (2021) demonstrates that AI is shaped by wider social, economic, and political structures rather than being a neutral technical object. Addressing this challenge requires more representative data, regular evaluation, and the involvement of affected communities in system design and review.
2. Many indigenous languages and knowledge systems have limited representation in digital datasets and AI products. This can reduce the accuracy of language applications and restrict access to services for people who do not use dominant global languages. Creating reliable resources requires funding, linguistic expertise, community consent, and ongoing maintenance. Ndasauka (2024) supports the inclusion of African perspectives in technology, making language and knowledge representation an important part of technological inclusion.
3. Incorporating indigenous knowledge into AI raises questions about consent, ownership, confidentiality, attribution, and the sharing of benefits. Some knowledge may be sacred, restricted, or collectively held and therefore inappropriate for unrestricted digital use. Using such material without permission can reproduce unequal relationships between technology developers and knowledge holders. Institutions need clear procedures for consent, access, data security, attribution, and fair benefit-sharing where appropriate.
4. The integration of functional and indigenous perspectives requires interdisciplinary expertise, digital infrastructure, funding, and institutional support. Universities and public agencies may lack the resources to develop language datasets, conduct ethical audits, or sustain collaboration with communities. A shortage of trained personnel can also limit the capacity to evaluate systems independently. Without investment in education, research, and infrastructure, culturally responsive AI may remain an aspiration rather than a practical achievement.
5. Tensions between efficiency, cultural values, and rights. A system designed to maximize speed or productivity may conflict with community expectations, local practices, or individual rights. In addition, communities are not uniform, and members may disagree about which values should guide technological decisions. Some traditional practices may also require critical assessment in light of equality, privacy, and human dignity. The challenge is to avoid both technological imposition and uncritical acceptance of tradition by using evidence, inclusive dialogue, and human-rights safeguards.

RECOMMENDATIONS

1. Governments, tertiary institutions, and relevant agencies should develop AI policies that combine technical standards with cultural inclusion, fairness, privacy, transparency, accountability, and human oversight. Policies should require risk assessment for high-impact systems and establish clear procedures for complaints, review, and redress. They should also recognize linguistic diversity and the legitimate interests of communities whose knowledge may be used in AI development. Such policies would turn broad ethical commitments into practical responsibilities.
2. Universities, technology developers, language specialists, and community representatives should collaborate to create reliable digital resources for underrepresented Nigerian languages. Data collection should follow clear rules concerning consent, privacy, cultural restrictions, attribution, and quality assurance. AI tools should be tested with actual speakers and users rather than evaluated only by developers. Investment in language resources can improve access to educational materials, agricultural advice, public information, and other digital services.
3. Tertiary institutions should include AI ethics, African philosophy of technology, indigenous knowledge, and critical digital literacy in relevant programmes. Students should examine practical cases involving automated assessment, public-service decisions, language tools, and agricultural applications. Teaching should encourage learners to evaluate technical performance alongside cultural suitability, fairness, and potential harm. This approach can prepare graduates to design, use, and govern AI responsibly rather than treating technical competence as the only requirement.
4. Research institutions should establish partnerships among computer scientists, philosophers, linguists, educators, social scientists, policymakers, and indigenous knowledge holders. Communities should participate from the earliest stages of problem identification through data

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collection, system testing, and evaluation. Agreements should clarify consent, access, attribution, confidentiality, and benefit sharing before knowledge is incorporated into AI systems. These partnerships can improve system relevance and reduce the risk of extracting knowledge without respecting the rights of its holders.

5. Institutions should assess AI systems for accuracy, fairness, privacy, cultural relevance, accessibility, and potential social consequences before and after deployment. Decisions with serious effects on people's rights or opportunities should remain subject to meaningful human review, and affected individuals should be able to challenge errors. Monitoring should continue because system performance and social conditions may change over time. Evaluation findings should be used to correct problems, improve the system, or discontinue applications that cannot be made sufficiently safe and fair.

CONCLUSION

Artificial intelligence offers important opportunities for improving education, agriculture, healthcare, public administration, communication, and economic activity. Nevertheless, the development of increasingly capable systems does not automatically guarantee cultural inclusion, ethical responsibility, or human welfare. Functional philosophical perspectives help evaluate AI in terms of purpose, performance, reliability, and practical consequences, while indigenous philosophical perspectives bring attention to local knowledge, language, community relationships, moral responsibility, and human dignity. Their integration can therefore broaden the criteria used to determine whether an AI system represents meaningful and responsible progress.

The proposed approach does not assume that indigenous knowledge is uniform or infallible, nor does it suggest that technical performance is unimportant. Rather, it maintains that responsible AI requires both evidence of effectiveness and critical consideration of the social purposes and consequences of technology. Further empirical research is needed to test how the proposed framework works in specific Nigerian educational, agricultural, and public-service settings. Ultimately, integrating functional and indigenous philosophical perspectives can help guide the development of AI that is not only capable but also culturally responsive, ethically defensible, and accountable to the people it serves.

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