



Integrating Indigenous Knowledge Systems into AI Development in West Africa: A Review of Practices and Potentials

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Abstract

The integration of Indigenous Knowledge Systems (IKS) into Artificial Intelligence (AI) development in West Africa remains underexplored despite its potential to enhance local AI applications and promote equitable technological advancement. The review will employ a comprehensive search strategy using databases such as PubMed, Google Scholar, and Scopus. Eligible studies include peer-reviewed articles, grey literature, and case studies published in English from January to the present. Studies focusing on Egypt or West African countries where AI applications intersect with IKS will be prioritised. A total of 56 relevant studies were identified, predominantly concentrated within Egypt. The findings suggest that while some projects have successfully incorporated IKS elements into AI models, there is a notable lack of standardised methodologies and robust validation processes across all studies. The integration of IKS into AI development in West Africa holds significant promise for enhancing local technological solutions and fostering cultural preservation. However, the current landscape lacks consistent frameworks and empirical evidence to guide future research and implementation efforts. Future work should focus on developing standardised methodologies for integrating IKS into AI models, conducting more rigorous validation studies, and establishing collaborative platforms between traditional knowledge holders and AI developers in Egypt and West African countries. Artificial Intelligence, Indigenous Knowledge Systems, Scoping Review, West Africa, Egypt Model estimation used $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_{i=1}^n \text{sumiell}(y_i, f\theta(\xi)) + \lambda \text{Vert}\theta \text{rVert}^2 \}$, with performance evaluated using out-of-sample error.

Keywords: African geography, AI development, Indigenous knowledge systems, Methodology, Theoretical frameworks, Cultural integration, Ethnographic research

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