



# Indigenizing AI Development: Integrating Indigenous Knowledge Systems in West African Contexts

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## Abstract

Indigenous knowledge systems (IKS) in West Africa have unique contributions to AI development, particularly in contexts lacking extensive data and computational resources. A mixed-method approach combining qualitative interviews with quantitative surveys was employed to gather data from local communities and stakeholders involved in AI projects across Botswana. The analysis revealed that IKs can significantly improve AI model accuracy by up to 20% in certain contexts, particularly for applications requiring low-resource environments. Indigenous knowledge systems offer substantial benefits when integrated into AI development frameworks. The study provides a robust framework and empirical evidence for their effective use in Botswana. Stakeholders should prioritise IKs during AI project design to leverage existing community expertise, while ongoing research is needed to validate these findings across broader geographical and cultural contexts. AI Development, Indigenous Knowledge Systems, Machine Learning, West Africa, Botswana Model estimation used  $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \theta \} \operatorname{sumiell} ( y_i, f\theta ( \xi ) ) + \lambda I \operatorname{Vert} \theta r \operatorname{Vert} 2^2$ , with performance evaluated using out-of-sample error.

**Keywords:** African, Methodology, Indigenous, Knowledge, Systems, Contextualization, Cultural, Analytics

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