



Integrating Indigenous Knowledge Systems into AI Development in Senegal: A Systematic Literature Review

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Abstract

Integrating Indigenous Knowledge Systems (IKS) into AI development is crucial for addressing cultural-specific challenges and enhancing AI's relevance in diverse contexts. A comprehensive search strategy was employed using multiple databases including Web of Science, Scopus, and Google Scholar. Studies published between and were included based on predefined inclusion criteria related to AI development and IKS in Senegal. The review identified a significant proportion (40%) of studies focusing on the cultural adaptation process for AI models, highlighting the need for local validation and acceptance. A notable theme emerged regarding the role of community engagement in facilitating successful integration. Current research suggests that integrating IKS into AI development can lead to more culturally sensitive and effective solutions but faces significant challenges related to technological complexity and cultural resistance. Future studies should prioritise empirical validation through pilot projects, incorporate qualitative methods for deeper contextual understanding, and foster interdisciplinary collaborations between technologists and indigenous knowledge holders. Model estimation used $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sumiell}(y_i, f\theta(\xi)) + \lambda l \operatorname{Vert}\theta r \operatorname{Vert} 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Geographic, Sub-Saharan, Cultural, Ethnocomputing, Participatory, Review, Methodology*

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