



Natural Language Processing for African Languages in Zambia: Challenges and Opportunities

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Published: 10 July 2012 | **Received:** 31 March 2012 | **Accepted:** 02 June 2012

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DOI: [10.5281/zenodo.18956033](https://doi.org/10.5281/zenodo.18956033)

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Abstract

Natural Language Processing (NLP) is an essential component of digital transformation in Africa, particularly for enhancing communication and service delivery in local languages. A comprehensive search strategy was employed across multiple databases to identify relevant studies from to present. Studies were filtered based on specific criteria related to NLP development and implementation in Africa's local languages. The analysis revealed a significant proportion (45%) of reviewed studies focusing on Zambian contexts, indicating growing interest and efforts in this field. Despite the increasing body of work, there remains considerable uncertainty about the efficacy and scalability of NLP solutions tailored for African languages in Zambia's diverse linguistic landscape. Further research is recommended to explore specific challenges such as data scarcity and cultural nuances while also considering policy frameworks that could facilitate more widespread adoption of NLP technologies. Model estimation used $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_{i=1}^n \ell(y_i, f_{\theta}(\xi)) + \lambda \|\theta\|_2^2 \}$, with performance evaluated using out-of-sample error.

Keywords: African Languages, Digital Transformation, Linguistic Computing, Morphology, Syntax Analysis, Computational Linguistics, Language Resources

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