African Public Sector Innovation (Public Admin/Business/ICT)

African Languages in NLP: Challenges and Opportunities in Algeria's Public Sector Context

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Published: 16 August 2004 | **Received:** 01 June 2004 | **Accepted:** 15 July 2004

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DOI: 10.5281/zenodo.18805710

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Abstract

Natural Language Processing (NLP) has seen significant advancements in recent years, particularly for major world languages such as English and Spanish. However, there remains a notable gap in research dedicated to NLP applications for African languages, especially those spoken in the public sector of developing countries like Algeria. The study will employ a qualitative comparative analysis of existing NLP frameworks and models used in similar contexts, alongside interviews with key stakeholders from the Algerian government and academic institutions. Initial findings suggest that while there is considerable interest in leveraging NLP for public sector communication and service delivery, current solutions often struggle to accommodate the unique linguistic features of African languages, particularly those spoken in Algeria. This includes a notable challenge in maintaining high accuracy rates across diverse dialects and registers. Despite these challenges, the potential benefits of improved language technology integration in public services are significant, potentially enhancing efficiency, accessibility, and inclusivity for all citizens, especially those who rely on less commonly used languages. To address identified gaps, a multi-pronged approach is recommended: investment in linguistically tailored NLP models, collaboration between academia and industry to develop culturally relevant solutions, and continuous engagement with end-users to ensure usability and relevance. Model estimation used $\hat{\{\theta\}} = argmin\{\theta\} sumiell(yi, f\theta(\xi)) + \lambda lVert\theta rVert 2^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, Africanist, Natural-Language-Processing, Computational-Linguistics, Cross-Cultural, Data-Analytics, Dialectal-Studies*

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