African Computer Engineering

The Potential of 5G Technology in Digital Transformation Across African Cities: A Review

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Abstract

The rapid urbanization in African cities has necessitated a focus on digital infrastructure to support emerging technologies. A comprehensive literature search and thematic analysis were conducted using databases such as IEEE Xplore and Google Scholar. The application of 5G in urban settings has shown promising potential, particularly in enhancing connectivity in densely populated areas, with a significant proportion (70%) of studies indicating improved data transmission rates. While the integration of 5G technology is still nascent in African cities, its benefits are evident in terms of enhanced communication and digital services delivery. Investment should be directed towards pilot projects to assess scalability and cost-effectiveness before full-scale deployment. 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: *African urbanization, Digital transformation, 5G technology, Mobile networks, Wireless communications, Internet of Things, Network architecture*

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