Navigating Digital Transformation: A 5G Technological Approach in Kenyan Urban Environments

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Abstract

The proliferation of urban environments in Kenya has fueled a growing demand for advanced digital technologies to enhance connectivity and services. The study employs a mixed-methods approach combining qualitative interviews with quantitative surveys to assess user experiences and technological performance across diverse urban areas. A preliminary analysis indicates that users in high-density urban centers experience an average improvement of 30% in data transmission speed compared to traditional networks, while network latency decreases by approximately 25%. The findings suggest a significant potential for 5G technology to revolutionize service delivery and infrastructure in Kenyan cities, though challenges related to spectrum allocation remain. Authorities should prioritise public-private partnerships to ensure equitable access to 5G services across urban areas, while technological developers must address security concerns to protect citizens' privacy. 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.

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This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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