



Navigating Digital Transformation: Methodological Approaches to Assessing 5G Technology's Impact in Ugandan Cities

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Abstract

The rapid advancement of digital technologies has spurred interest in assessing their impacts on urban development, particularly in emerging economies like Uganda. The advent of 5G technology is expected to revolutionize communication and services across Ugandan cities. The research methodology integrates quantitative surveys, qualitative interviews, and an econometric model. The econometric component employs Ordinary Least Squares (OLS) regression to analyse the relationship between 5G deployment and economic growth indicators. A preliminary analysis reveals that 5G coverage is positively associated with increased smartphone usage by a proportion of 12% in urban areas, suggesting enhanced digital connectivity benefits. While initial findings indicate a positive correlation between 5G availability and consumer device adoption rates, further empirical studies are needed to validate these results and explore broader socioeconomic impacts. Policy makers should prioritise equitable access to 5G services to mitigate potential disparities in urban digital inclusion. Additionally, fostering public-private partnerships can facilitate the necessary infrastructure development. Digital Transformation, 5G Technology, Econometrics, Urban Development, Uganda Model estimation used $\hat{\theta} = \underset{\theta}{\operatorname{argmin}} \{ \sum_{i=1}^n (y_i - f(\theta(\xi)))^2 + \lambda \|\theta\|_2^2 \}$, with performance evaluated using out-of-sample error.

Keywords: Geographic, Africa, SmartCities, SocialSimulation, CyberSecurity, DataAnalytics, QuantitativeResearch

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