



5G Infrastructure and Digital Urban Transformation in Egyptian Cities

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Abstract

Egypt is undergoing a digital transformation aimed at enhancing urban infrastructure and services through advanced information and communication technologies. A mixed-methods approach combining qualitative interviews with quantitative data analysis was employed to assess the impact of 5G infrastructure on urban development and service delivery. Interviews revealed a significant interest from city planners and tech companies in implementing 5G, particularly for smart city projects. A preliminary survey estimated that up to 30% of Egyptian cities are planning or have implemented 5G networks by the end of . The findings suggest that 5G technology can play a pivotal role in accelerating digital urban transformation in Egypt, though further empirical research is needed to validate these preliminary results. City authorities and tech firms should prioritise pilot projects with key stakeholders to optimise 5G deployment strategies and address potential challenges such as cost and network reliability. digital transformation, smart city, 5G technology, urban development 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: *Digital Urbanization, Geospatial Analysis, Network Slicing, Edge Computing, Cybersecurity Protocols, IoT Applications, Blockchain Technology*

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