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Big Data Analytics in Urban Planning and Service Delivery in Cairo, Egypt: An Analysis

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Abstract

The urban environment of Cairo, Egypt is characterized by rapid population growth and increasing demand for services such as transportation, housing, and healthcare. The research employed a mixed-methods approach combining qualitative interviews with quantitative analysis of existing data sets related to urban services in Cairo. Analysis revealed significant disparities in public transportation use (35% using the metro, less than 10% using buses) and identified areas where service delivery could be optimised for better citizen engagement. Big data analytics has highlighted key inefficiencies that can inform targeted interventions to enhance urban services and infrastructure in Cairo. Implementing a predictive maintenance system for public transport vehicles based on usage patterns and reducing wait times at bus stops by reallocating resources could improve service delivery. 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: *Cairo, GIS, IoT, Spatial Analysis, Data Mining, Urban Informatics, Smart Cities*

ABSTRACT-ONLY PUBLICATION

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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