Big Data Analytics in Urban Planning and Service Delivery within Cairo, Egypt: An African Perspective

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Abstract

Urban planning and service delivery in Cairo, Egypt face significant challenges due to rapid urbanization and population growth. Big data analytics offer a promising approach to address these issues by providing insights for more efficient resource allocation. This research employs a mixed-methods approach combining quantitative analysis with qualitative insights from interviews and focus groups. Data sources include administrative records, social media analytics, and citizen feedback surveys. The findings indicate that big data analytics can significantly improve the efficiency of public transportation systems by predicting traffic patterns and optimising route planning, reducing travel time by up to 20% in peak hours. This study underscores the potential of big data analytics for enhancing urban services. It provides a roadmap for policymakers and planners to leverage data-driven solutions for more sustainable and efficient city management. Policymakers should invest in infrastructure that supports big data collection and analysis, such as robust telecommunications networks and secure databases. Public engagement is also crucial for ensuring data privacy and relevance. 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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