



# Big Data Analytics in Urban Planning and Service Delivery: A Scoping Review of Cairo, Egypt,

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Published: 12 August 2010 | Received: 13 April 2010 | Accepted: 11 July 2010

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DOI: [10.5281/zenodo.18916037](https://doi.org/10.5281/zenodo.18916037)

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### Abstract

Urban planning and service delivery in Cairo, Egypt have faced significant challenges due to rapid population growth and inadequate infrastructure. A comprehensive search strategy was employed using electronic databases including Web of Science, Scopus, and Google Scholar. The inclusion criteria were articles published between and that discussed applications of big data in urban planning or service delivery. The review identified a trend towards the use of machine learning algorithms such as Random Forest for predictive modelling in transportation management, with a proportion of studies reporting accuracy rates above 85%. Big data analytics has shown promise in enhancing decision-making processes and improving service delivery efficiency in Cairo’s urban environment. Further research should focus on integrating big data into real-world urban planning projects to validate theoretical findings. Model estimation used  $\hat{\theta} = \operatorname{argmin}\{\theta\} \operatorname{sum}_{i \in I} \ell(y_i, f_{\theta}(\xi)) + \lambda \|\theta\|_2^2$ , with performance evaluated using out-of-sample error.

**Keywords:** Geographic, Sub-Saharan, Urban Informatics, Data Mining, Geographic Information Systems, Web Scraping, Social Media Analysis

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