

Optimizing Economic Predictors for Digital Growth in Hosting MSEs with Neural Boosted and KNN Models

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Mega sporting events (MSEs) have emerged as an effective instrument for driving economic growth in host countries. Digital capabilities have also influenced national development. This study addresses how economic indicators and digital advancement have a parallel transition to the sustainable growth of host nations. This study employs various machine-learning techniques and combines information from selected economic indicators and digital capabilities. Therefore, two perspectives of the validation are merged to produce economic indicators on digital advancement: (i) validation as a most critical predictor of digital advancement prediction and (ii) validation as a most effective machine learning model for prediction. A quantitative variance in the decision trees as a contribution value is an empirical illustration of the significant predictor, and performance metrics such as RSquare, RASE, and SSE are used to explain the selected machine learning model. The period of change spans five years, from 2016 to 2020. The digital evolution of host countries is significantly influenced by three specific indicators: exports of goods and services, charges for using intellectual property payments, and exports as a percentage of GDP. Riding along with the K-Nearest Neighbours model, which has the best performance, especially in host nations, results in improved forecast accuracy. According to this study, a country's economic status can be significantly improved, and digital transformation can be accelerated by hosting MSEs. The results offer empirical insights that policymakers can use to strategically fund digital infrastructure and major sporting events, promoting technological and economic growth.

Keywords: *Mega Sporting Events (MSEs), Machine Learning, Economic Leverage, Hosting MSEs, Digital Evolution Prediction.*