OpenAI Group

Research Proposal: Electricity Access in Africa

1.Background

Countries with reliable electricity tend to have higher productivity, a better standard of living, and increased competitiveness in the Global market. Electricity is used in all industries, such as Agriculture, Education, and Healthcare, ensuring that the operations of these industries are effective.

Unfortunately, Africa lacks this valuable resource causing stagnation in our economy. This research is focused on conducting predictive modeling of Electricity Access in Africa using data science and analytic techniques.

This analysis will help us gain insights into the factors affecting access to electricity in Africa. It will also aid electricity companies in Africa to put practical measures to ensure an adequate supply of electricity, promoting economic growth in the continent.

1. References and Ideas:

According to the data analysis and projections of the International Energy Agency (IEA) , around 110 million new connections are needed each year from 2022. With the pace seen in recent years this target remains far off track.

The idea of this project is to conduct analysis to track the trend of electricity access in Africa and attempt developing predictive modeling of electricity access in Africa to identity the main areas for improvement through the forecast and trends.

3. Problem Statement

The central challenge addressed in this research is to not only to predict the future trend of electricity access in Africa, but to understudy the dynamics and also to delve deeper into the reasons behind electricity access scenarios in Africa.

This would take the approach of attempting to develop predictive models for important factors influencing electricity access in Africa. At the end, we hope to propose targeted interventions to address these challenges.

4. Objectives

● Identify and analyze the root causes and key variables contributing to poor electricity access in Africa.

● Study the trends of Access to electricity in Africa.

● Provide actionable and targeted recommendations to enhance percentage of the population with access to electricity.

● Forecast future electricity trends.

**5.Methodology**

**5.1 Datasets:**

<https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS>

**5.2 Data Analysis and Modelling:**

● Apply advanced data cleaning and preprocessing techniques to handle missing values and outliers.

● Utilize statistical methods to identify correlations between a broader set of variables and their impact on electricity access rate.

● Conduct detailed exploratory data analysis to uncover nuanced trends and patterns associated with poor access rate to electricity.

● Implement robust machine learning algorithms for predicting and modeling future trends.

**5.2 Intervention Assessment:**

● Extend the analysis to assess the reasons behind predicted trends.

● Propose targeted interventions and policy improvements based on the predictive models and root cause analysis.

**5.3 Solution Deployment:**

Develop an interactive and user-friendly Streamlit web application to deploy the enhanced predictive model and intervention assessment tools or an interventionist dashboard.

**6. Expected Outcomes:**

● Evaluation of existing policies and recommendations for improvement.

● In-depth understanding of the root causes and key variables influencing electricity access by the population.

1. **Conclusion:**

This project aims to not only understudy the trends and scenarios in accessing electricity by the populace but to gain deeper insights that will help policymakers with their project implementation with regards to increasing electricity access in Africa

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By taking a deep dive coupled with a systematic approach that combines predictive modelling with root cause analysis, the proposed framework provides a robust foundation for designing solutions that promote access to electricity in Africa.