# THE GLOBAL ARTIFICIAL INTELLIGENCE (GAI) INDEX ANALYZES TRENDS IN DEVELOPING COUNTRIES THROUGH DATA ANALYSIS TECHNOLOGIES

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**Abstraction**: The Global Artificial Intelligence (GAI) Index uses data analysis techniques to analyses and understand trends in developing countries. Through the use of advanced data science techniques, the index assesses various aspects of the adoption, implementation, and impact of artificial intelligence (AI) in developing countries. By analyzing data-driven insights, the GAI Index provides valuable information on the trajectory of AI development, the effectiveness of policy initiatives, and the opportunities and challenges these countries face in leveraging AI for socioeconomic progress. According to those opportunity, we use data science techniques to show how impact GAI Index in developing countries strategies, sustainable and growth.

***Key words -*** GAI, Linear regression, data analysis.

**Introduction:**

In an era characterized by rapid technological advancement and global interconnectedness, the integration of artificial intelligence (AI) is emerging as a transformative force and is expected to reshape industries, societies, and economies worldwide. As countries seek to leverage AI's potential to drive innovation and address pressing challenges, understanding the dynamics of AI adoption and utilization has become paramount. The Global Artificial Intelligence (GAI) Index is at the forefront of this effort, serving as a comprehensive analytical tool that reveals trends and patterns in developing countries. By harnessing the power of data science technology, the GAI Index provides valuable insights into the evolving landscape of AI adoption and sheds light on the opportunities and obstacles encountered by countries seeking AI-driven development. This method provides data-driven insights, the significance of the GAI Index in guiding policy decisions, fostering collaboration.

Using data analytics and machine learning techniques to GAI index analysing offers an innovative solution to the challenge of data-driven insights. By leveraging data-driven insights, statistical organisations can proactively recognize states positions, considering leaving. This innovative approach not only reduces the financial budget, complexity but also develops a stronger, more customer-focused banking workforce.

In recent times, the emergence of sophisticated machine learning algorithms within the field of computer science has spurred the development of robust quantitative methods for extracting valuable insights from industry data. Specifically, supervised machine learning techniques, which involve computers learning from in-depth analyses of extensive and well-labeled historical datasets, have exhibited their proficiency in extracting meaningful insights across various domains.

In another study, the focus shifted towards utilizing neural networks to forecast customer

churn within the banking sector, which is crucial for customer retention efforts. The study aimed to present a case study illustrating the application of data mining techniques, particularly neural networks, for extracting insights from banking sector databases. The findings indicated that clients engaging with a greater number of bank services tend to exhibit higher loyalty, suggesting a strategy for the bank to concentrate on clients utilizing fewer than three products and tailor offerings to their specific needs.

This variable pivotal indicator of developing countries, a statistical metric for index analysing to get valuable insights. The dataset has various features such as GAI index, Labor, GDP as shown Figure 1.

**Figure 1. Data description**

| Country | GAI index | Labor force, total | GDP growth (annual %) |
|---|---|---|---|
| China | 62.92 | 781831676 | 2.98908408603653 |
| India | 30.36 | 523839158 | 7.23969328081449 |
| Saudi Arabia | 25.6 | 15913705 | 8.68073610168936 |
| Poland | 25.2 | 18219393 | 5.26036442513194 |
| Russia | 21.99 | 73716244 | -2.06971152527731 |
| Brazil | 18.89 | 108380011 | 2.90053061522693 |

This information provides a valuable foundation for leveraging advanced analytical techniques and machine learning algorithms to develop a predictive model for prediction.

We represent plot of visualizing the distribution of categorical variables in our dataset that is specifically in the context of customer as shown Figure 2.

**Figure 2. Bar feature distribution**.
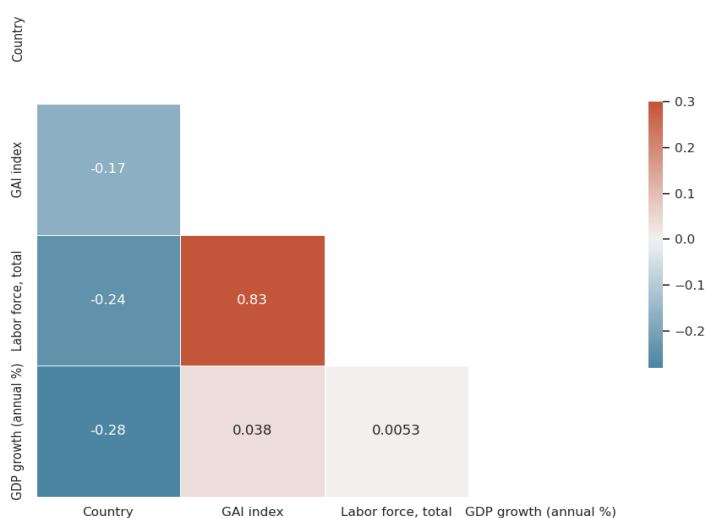


The exact values of the labor force index are not displayed on the map, but there is a legend on the right side of the map that shows the possible values. The legend ranges from 0 to 100, with 100 being the highest possible labor force index as shown Figure 3.

**Figure 3. Labor force index data visualization.**



Labor force index

It is important to note that choropleth maps can be misleading, as they can make small differences in data appear larger than they really are. For example, China and India is leading with that the difference between a country with a labor force index of 90 and a country with a labor force index of 80 may appear much larger on the map than it actually is.

GAI index of developing counties represented in Figure 4. According to plot, China, India, Saudi Arabia, and Poland has great impact in worldwide. By analyzing these factors, the GAI Index aims to provide a comprehensive picture of a country's AI ecosystem and its relative position in the global landscape.

**Figure 4.   GAI index data visualization.**
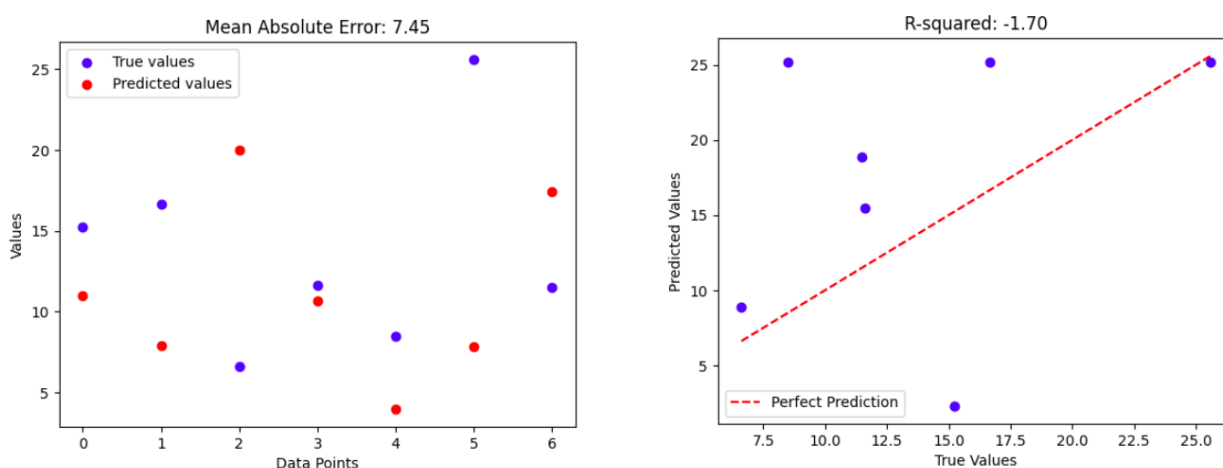


GAI index
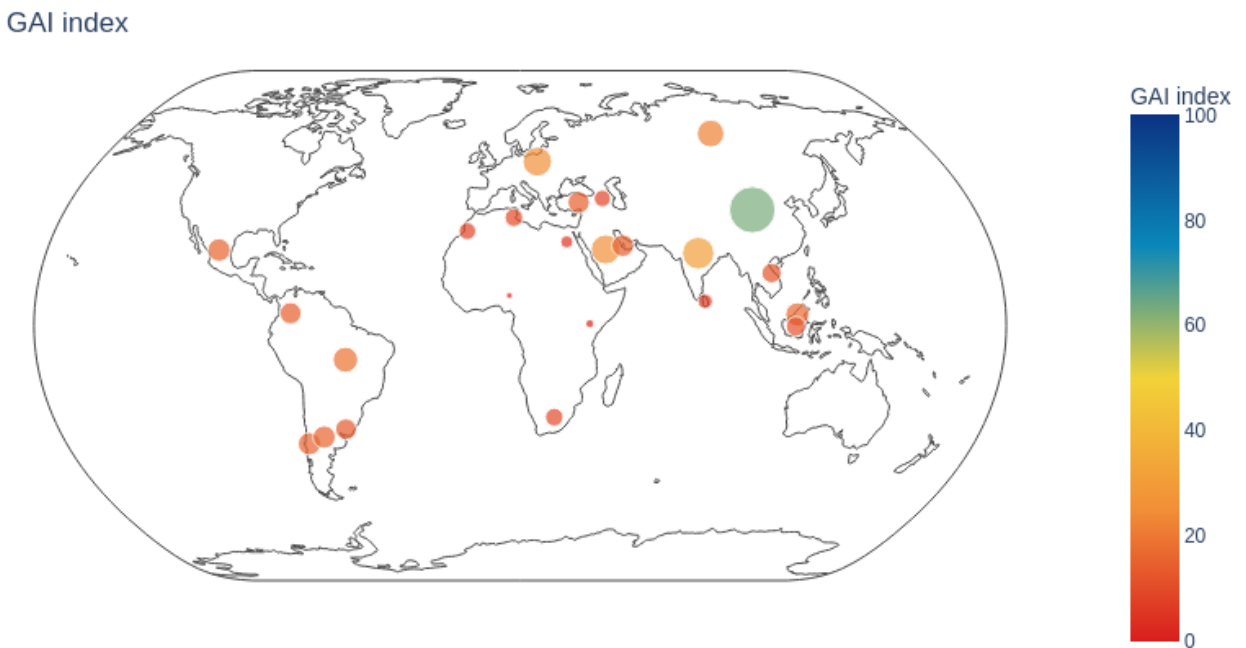
We applied one of wide used machine learning model that Linear regression. This model is

a powerful statistical technique commonly used for prediction tasks in various fields such as finance, economics, and machine learning. At its core, linear regression aims to model the relationship between a dependent variable and one or more independent variables  by fitting a linear equation to observed data points.

Our linear regression model assumes that the relationship between the independent variables and the dependent variable is linear, meaning that changes in the independent variables are associated with a constant change in the dependent variable. The model's goal is to find the best-fitting hyper pane line  that minimizes the difference between the observed values and the predicted values as shown Figure 5

**Figure 5. Mean absolute error and R-square**



In summary, the application of data analysis and machine learning methods for predicting GAI index, improve it and valuable impact developing process of countries. Data visualization tool provide more understandable information. Linear Regression  demonstrate considerable performance for our data..

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