

# Using World Development Indicators to Provide a Way for Multinational Companies to Diversify their Operational Structure:

## Introduction:

There are a plethora of factors that determine how developed a country is in the world. Typically, countries are considered to be developed if they:

- Are highly industrialized.
- Have a large female workforce.
  - Particularly women in high ranking positions such as executives.
- Use a disproportionate amount of the world's resources.
  - Gas for cars.
  - Electricity for homes.
  - Oil for production.
- Have stable birth and death rates.
  - Low infant mortality (less than 10 per 1,000).
  - Life expectancy over 70 years, many over 80 years.
  - Quality medical care.
  - High living standards.
- Have higher levels of debt, usually for production.
- Have a high Gross Domestic Production (GDP) per Capita

And much more.

Outside of the developed category, there are developing countries that range from being highly developed to underdeveloped. For example; although it is the world's second largest economy, China falls into a developing country category because of the disparity in its wealth, quality of life, and GDP per capita. Argentina is also considered a developing country because of its political disarray, economic uncertainty and erosion of quality of life despite ranking higher in vast majorities of metrics as compared to other countries.

## Problem Statement:

Development within a country will always be a continuous journey because of ever changing conditions. In the pursuit of maintaining and upgrading these levels, we want to determine what stage of development a country is in and help it acquire the tools necessary to continue building itself up.

We want to look at the income group a country falls into, its lending category and its development factors in order to determine the level and type of investment we will put into that country.

*How can we determine which country to pour what resources into for development in terms of:*

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- *Infrastructure*
- *Higher learning*
- *Business*
- *Manufacturing and Production*

## **The Client:**

Our clients are multinational companies who are interested in developing the world by having a portfolio of countries or regions to diversify their operations in order to maximize use of resources and increase efficiency, diversity, brand awareness and profit. From our analysis and recommendations, these companies can determine where to base their headquarters, production plants, manufacturing plants, call centers, education centers, recruitment centers and more. Also, companies dealing with infrastructure can determine which countries to invest certain resources and concepts into; such as highway development vs. traffic relief. The opportunities are boundless.

## **Data Analysis:**

The data that we will be using are world development indicators from the world bank. These indicators are a collection of quality statistics about global development.

It can be found here : <https://datacatalog.worldbank.org/dataset/world-development-indicators>

The databases contain 1,600 time series indicators for 217 economies and more than 40 country groups or regions; with data for many indicators going back more than 50 years. There are a total of 97 topics that the indicators fall into and 12 total categories surrounding these topics. Countries are placed in regions, income groups and lending categories.

The world bank has datasets pertaining to country, income group, lending categories, and development indicators and its relation over time. These datasets will be combined to look at an overall landscape for each country and the various categories they fall into. Compiled from officially-recognized international sources, this dataset presents the most current and accurate global development data available.

## **Solution and Approach:**

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We will solve the problem by predicting development categories for each country using multiclass classification or clustering. Although the exact categories and method will be determined through analysis, possible methods may include:

- K-means clustering
- Multiclass logistic regression
- Multiclass neural networks
- Multiclass decision forest
- Multiclass decision jungle
- One vs. All multiclass

Countries may have categorical scores from the number of indicators that fall into them:

- Economic Policy & Debt - 510
- Education - 147
- Environment - 138
- Financial Sector - 54
- Health - 239
- Infrastructure - 41
- Social Protection & Labor - 161
- Poverty - 24
- Private Sector & Trade - 167
- Public Sector - 96
- Gender - 21
- World Bank, Global Development Finance - 1

*\* be sure to clearly define each category*

Then, be labeled or clustered into groups based off of these scores. From these scores, clusters, and/or classifications, our clients can decide how to move forward in their approach to doing business in each country of interest.

Our aim is to categorize or cluster each country based off of their development indicators so that our clients may decide how to invest their resources into that country.

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## **Deliverables:**

Jupyter notebook for streamlining the analysis and prediction model and report with possible slide deck for a quick overview.

## **Source:**

<https://datacatalog.worldbank.org/dataset/world-development-indicators>

<https://www.investopedia.com/updates/top-developing-countries/>