



Team Name : Adiraa

Team Size : 2

Bussiness Challenge : Global Economic Data: Comprehensive Analysis and Insights

General Description

Introduction:

The given problem statement has a collection of data set of 5 different economic parameters: Corruption, Cost of living, Unemployment, Tourism, and Richest Countries. Different data sets have different set of countries and offer different kinds of insights. Our solution aims to boil down the complex data into simpler and comprehensible information through visually appealing reports, stories, and dashboards (made using IBM Cognos). Our end goal is to provide information to businesses, policymakers, and researchers to help them make data-driven decisions and navigate the complex global landscape.

Our Solution/Idea:

We will first have a landing page which will give any general user information about:

1. What basically is world economic data, why is it important, and what he can expect from this site.
2. Introduce and define the 5 key factors that we are going to explore (the 5 parameters given to us) along with their personal importance.

Then the user will have an option to choose between one of the five parameters whose analytics and insights he wants to see (which he can of course come back and reset later to explore any other parameter).

Now, after he selects a particular parameter (Let us suppose he selects "corruption"), he will be redirected to a site that gives him the complete analysis of that particular parameter. It will contain:

1. A basic introduction to what the data shows, how many countries have been involved (for example, corruption has a data set of 110 countries).
2. This will be followed by our different dashboards, which will give insights that can be drawn from the data set of that particular factor alone (corruption in our example). This may include 'comparison of corruption between all countries', 'No of countries where corruption is higher/lower from the mean corruption', 'top 10 countries with least/most corruption', etc.
3. Insights drawn will be written in simple english at the end of these dashboards.
4. Now, below this section, the user will have the option to compare how the selected parameter is affected by other parameters (correlation).

The Correlation page:

1. When he chooses an option from the drop-down menu (let's say he selected "unemployment"), he will be redirected to another page, where using Cognos, different graphs and dashboards will be shown to educate the user about the correlation between those 2 factors. For example, how corruption grows/falls with unemployment.
2. The insights drawn will be written in simple english for the user to understand and comprehend.
 - (for example) This we feel would personally be very useful for researchers trying to figure out reasons for corruption.
3. Similarly, comparisons between different factors will be useful for people from different walks of life.

Aim:

To summarise, we want to educate the user with what insights can be drawn from each parameter in the world economic data, first INDIVIDUALLY. Once he has understood the data of that particular parameter alone, we then throw some light on how this parameter depends on the other given parameters (if it does) so that he can take data-driven decisions based on the complete information and not just one particular factor alone. Making dashboards and reports with this two-stage methodology helps to cover all possible grounds for extracting information.

For Example (Demonstration):

If a business wants to expand to a new country, it might prefer cheap labor, which may be readily available in countries with the highest unemployment rate. They may shortlist some preferred countries. Now, they may see how unemployment is varying with corruption. If corruption increases with an increase in unemployment, they might want to reconsider their shortlisted options (because they may not want to set up a new branch of their business in a country where corruption is at its peak). Giving this 2-factor comparison helps them find an optimal location for expanding their new business.

A prototype of our idea is attached in the 'Solution Document Link' below

Novelty / Uniqueness:

The World Economic Dataset presents country-wise data across five indicators that contribute to the growth of an economy - corruption, unemployment, tourism, cost of living, and annual income

(GDP per capita). Although this data is crucial to aid businesses, policymakers and researchers make informed decisions in their respective fields, it is quite difficult to make any sense out of this raw data. Our idea proposes an effective, interactive solution that enables stakeholders to draw meaningful insights in a short period of time. The novelty of our proposed solution is the correlation analysis across five dimensions of economic importance. While data analysis and visualizations for each economic indicator provide sufficient insights to understand the economy of a particular country, we believe that studying the correlation between them presents insights that are more suited to real-world scenarios. For instance, it is crucial to understand if GDP per capita is affected by the level of corruption in a country. If yes, how? Is there a linear or non-linear relationship? We can find answers to these questions by leveraging the power of data analytics using the correct tools such as IBM Cognos. Thus, our idea provides an edge to stakeholders throughout their decision-making process.

Business / Social Impact:

For now, we have thought of 3 different aspects which can generate revenue for us:

1. **Advertisements:** If our website attracts a lot of users, then any foreign company would like to make use of the traffic we generate. They might want to advertise their product on our site. For example, a fintech-based solutions company would like to advertise itself to target the different business clients we attract on our website. We will make sure that there are not a lot of ads running on our website otherwise it will spoil the experience of our users. (At max, 1 or 2 ads on the entire page)
2. **Freemium Business Model:** In this model, a company offers basic or limited features to users at no cost and then charges a premium for supplemental or advanced features. So here also, we can offer insights drawn from a parameter individually at no cost (free) to the user and then charge a premium for the 2-factor insights (correlations - our 3rd page).
3. If the future scope (described below) is successfully implemented, we can include that as a paid feature as well in our freemium model.

Technology Architecture:

Technologies:

IBM Cognos (Data Visualization, Analytics, and drawing insights)

Python - Matplotlib, Plotly, Dash (might be used), Seaborn, Numpy, Pandas (Data processing and Analysis)

Python - Pywebio (Interactive web interface) (Flask can be used as an alternative)

Architectural flow:

1. Before building the solution, it is crucial to examine the raw data for any null/missing values and outliers that may contribute to bias. This is the data preprocessing step, which is the basis for any analytics project. After this, we move on to the data-wrangling step, which contributes to the accuracy and quality of the analysis.
2. Once the data is prepared, we now import the dataset into the IBM Cognos platform to carry out further analytical processes. Since we are also making use of certain python libraries to support the process, the dataset is also imported to a python (Jupyter) notebook.

3. Our solution proposes two types of insights for interested stakeholders - individual analytics for all five economic indicators and correlation between all indicators. This is the step where we start building the solution. It will involve generating graphs and visualizations that help make sense of the raw dataset and also derive insights accordingly for each of them, both via Cognos and python.
4. The last step of the project flow involves deploying and presenting the analysis reports as a simple web interface. Although the python based web framework Flask can be used, we will be using a python library called PyWebio for creating the interface.
5. The final outcome would be a Global Economic Indicator dashboard, that enables users to interact with the graphs and visualizations to explore the trends across different countries globally.

A diagrammatic flow representation of the process is also attached to provide a visual walkthrough of our idea's transformation into a functional project -

ARCHITECTURAL FLOW OF THE PROJECT

PROPOSED IDEA — creating
a global economic
indicators dashboard



Data preprocessing
+
Data wrangling = Data Preparation.



Importing the dataset across
two platforms for analysis:

- ① IBM Cognos
- ② Python notebook (Jupyter)



Generating two types of insights:

Individual
across all 5
indicators

correlation
between all
indicators



Deploying as web interface
using PyWebio.



Global Economic Indicators
Dashboard — Project Outcome.

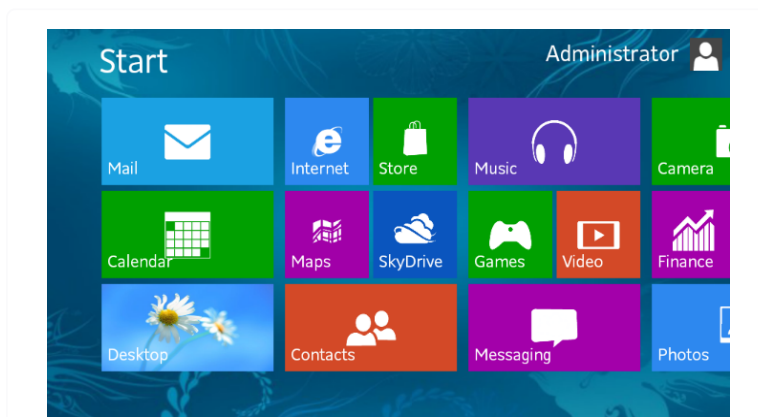
Scope of the Work:

Okay, so what we are currently trying to build is a Global Economic Indicator Dashboard, which gives insights based on certain factors and shows the correlation among them.

In the future, we can possibly integrate this with a “Country Comparison Tool”, which would allow the user to select his desired countries and compare the parameters among those countries only (provided that data is available for those countries).

To visualize this, we can say that this feature would work in a manner similar to the product comparison that the e-commerce giant Amazon does. Comparison among the selected countries based on all 5 parameters (Corruption, Cost of Living, Unemployment, Tourism, and Richest Countries) will be visually displayed enabling the user to gain insight about the countries in his interest of study.

The UI of this feature could be the “Metro layout” that Microsoft used in Windows 8 (shown below) with the different countries, available to be selected, and placed in different tiles.



The challenge in implementing this would be that we manually cannot analyze the data of all the parameters for all the different permutations of countries available. So, we probably would have to use an ML model which identifies which countries and which parameters are selected and generate an automated response of dashboards, giving insights in simple English at the end. This could be implemented by integrating AI with IBM Cognos (If this automation is possible).

We could include this feature as well in our paid model, accessible only to premium members.

Solution Document Link (Optional from Team):

https://drive.google.com/file/d/1eX-yBp5SD47r-Sdos_3RPg0b-thpjyEK/view?usp=sharing
(https://drive.google.com/file/d/1eX-yBp5SD47r-Sdos_3RPg0b-thpjyEK/view?usp=sharing)