DEF International is a mid-sized company that is looking into building onto its Procurement practice. Currently because of its size and budgetary constraint, it has not been able to build a robust spend forecasting tool.

You have been hired as a consultant by the company to help it with identification of the following metrics. With the help of the company you were able to acquire the backend spend data for your analyses. The excel sheet has 17 months of data (Jan 2019 to May 2020).

The company is interested in knowing its Procurement space. The key metrics should include (and not limited to):

1. Spend (Drill down by region, country, category, vendor)
2. Spend Projection (based on past 17 months of data)
3. Savings Projection (calculate the current year's projected full spend and assume a 6.5% of savings rate)
4. Add additional metrics (based on the data provided)

Activities to be performed –

1. Using the existing spend data, calculate spend and savings projection for remaining 7 months. Document all projection methods you used and your reasons for discarding/accepting it [based on model accuracy]
2. Establish a model that will be able to classify areas where we could expect the spend to go up by at least 10% based on last year's Jan-May and Jun-Dec data. [Jan-May 2019 vs Jun-Dec 2019 >10% -"Yes"; Jan-May vs Jun-Dec <10% - "No"].
3. Procurement is in need of a chat bot to be able to query it usual spend and savings data. It would be great to see if you could set up a preliminary chat bot [or outline the processes] that is able to address basic questions like –
    a. What is my overall spend for 2019
    b. How much have I spend in Commercial category in June 2019
    c. What will be the 2020 spend in R&D Category (Actual [Jan – May 2019]+ Projection [Jun – Dec 2019])
    d. What will be the 2020 projected savings for Corporate category

Case Study:

1. Please draft your proposal for the above scenario
2. Bring out all possible steps you would perform for data cleansing
3. Lay down all possible tools you will use at each stage along with details (such as libraries, algorithm structures, etc)
4. While it is not mandatory, but you may bring forward a working prototype for the chat bot interface (library of search terms need to be enhanced)
5. Special focus on some of the analysis you would conduct to forecasting and classification
6. Lay down all your assumptions clearly