Data Visualization Framework

Team Number : 4

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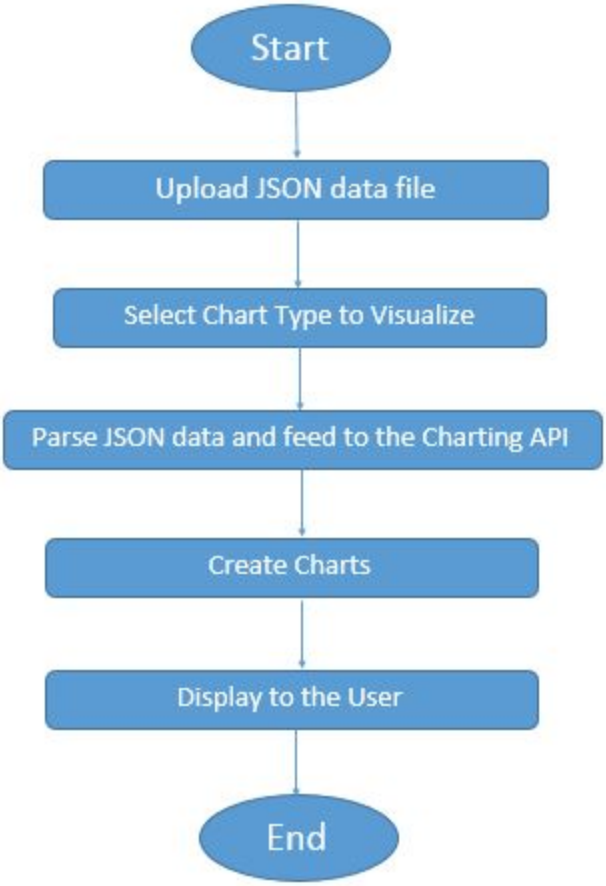
Problem Statement: Data Visualization aims to present textual data in visual or graphical format. Data in its raw sense, is little or not at all understandable. Patterns, trends and correlations that might go undetected in text-based data can be exposed and recognized easier with data visualization.

This project will provide a platform to graphically visualize data provided in Json format, preparing various charts, thus enabling users to extract meaningful information and establish context.

Approach: The data can be any JSON information conforming to the below mentioned structure. The data provided by data.gov.in is of the same format. User can upload a file containing JSON information on to the server which will then be parsed and displayed to the user. The user can then select the chart type from the list. The data is then uploaded to the server and fed to the charting api to construct a chart. The chart supports various features like selecting a particular range, zooming in-out, scrolling for large data across the x-axis, downloading the chart in pdf, or jpeg format, etc.

High Level Design:



Project Plan: The data will be taken in Json format from a file uploaded by the user and fetched to the system. At server's end Json data is parsed to make it compatible to that of charting APIs we are using. This data will be then fed to APIs to create graphs and charts as per users choice. We are proposing to use Highcharts.js API to prepare charts and graphs as it is highly customizable and configurable. For the backend, combination of Python + Flask seems the right fit as these are easy to use and configure. Flask provides lightweight bare minimum MVC framework that seems well suited for the purpose of this application. For UI enhancements, we will be using Twitter Bootstrap.

Requirements:

Structure of the JSON that is fed to the charting API needs to be of the format -


```
{
  "fields": [
    {
      "label": "label1"
    },
    {
      "label": "label2"
    },
    {
      "label": "label3"
    },
    {
      "label": "label4"
    },
    {
      "label": "label5"
    }  ],
  "data": [
    [
      "label1_value1",
      "label2_value1",
      "label3_value1",
      "label4_value1",
      "label5_value1",
    ],
    [
      "label1_value2",
      "label2_value2",
      "label3_value2",
      "label4_value2",
      "label5_value2",
   ]
  ]
}
```

Expected Outcome: User has the capability to visualize charts of various types for the data he uploads to the server. Probable chart types are:

1. Line Chart
2. Bar Chart
3. Column Chart
4. Area Chart
5. Bubble Chart
6. Pie Chart
7. Scatter Chart