**Project Title**

A micro service based API that reads customer usage details from the database and creates charts/graphs from these details.

**Description**

A micro service based API which will provide the customer’s aggregated usage records of the past few months from the centralized database to the client application/program .Once client receives the data from the API, Client App can then display the data received from the API in the form of charts/graph using java script (This java script is also to be built as part of this turbo project)

**Supporting Resources**

Use html, JavaScript, chart.js , JSON , RESTful API, Spring Boot, AJAX

**Procedure**

Develop a micro service based Restful API (using sprint boot) which will be called by the client applications.   
 § Client application will typically contain a form with the following fields and text box.  
 • Label and text box for Phone Number  
 • Label and text box for “From Invoice Date and To Invoice Date”  
 • Button - Submit  
 Note : Building client program is not the scope of this project. Client program is just used for testing the Restful API.  
   
 - On the click of the submit button from the client programs, Restful API will be called using AJAX . This API will  
 § Fetch data of the customer’s usage from database and create a JSON file containing refined aggregated usage records.  
 § How many months usage records is to be extracted from the tables should be evaluated (From Invoice Date and To Invoice Date fields)of the client programs.  
 § Below aggregation logic must be applied in the API on each month’s usage and charge records.  
 • Customer’s usage , rental and discount details and the total payable amount for the current month.  
 • Usage records for all local calls per period (Peak/Off peak) - On net and Off net included   
 • Usage records for all local calls per period (Peak/off peak) - On net  
 • Usage records for all local calls per period (Peak/off peak) - Off net  
 • Usage records for national calls per period (Peak/Off peak)  
 • Usage records for international calls per period(Peak/Off peak)  
 • Usage records for Data events (Peak/Off peak)  
 • Aggregated Local SMS events - On net and Off net included  
 • Aggregated Local SMS events - On net  
 • Aggregated Local SMS events - Off net  
 • Aggregated National SMS events   
 • Aggregated International SMS events  
 • Aggregated Roaming Outgoing charges  
 • Aggregated Roaming Incoming charges  
 • List of favorite numbers , total calls made to these favorite numbers , their duration and the total usage.  
 • Rental charges  
 • One time charges  
 • Billing Discounts  
   
 - This project also involves the development of a custom java script which will be responsible to read JSON (output of the API). This java script will in turn call in-built methods of chart.js to display the data of a JSON in a Graphical/Chart format.  
 o Client programs are expected to import this custom java script (as well as chart.js), so that this java script helps the client App to display the JSON data in chart/graph format on their browser.  
 o Note : Chart.js contains in-built method for displaying the graphs/charts out of raw data.

- Team needs to come up with the De-Normalized usage table structure/skeleton for Voice , Data , SMS and MMS events. These tables would be the source tables of Restful API for aggregation.  
 o Recommendation: Typically the usage tables contain following attributes.   
 § Calling Party (A number) – Customer’s Phone number  
 § Called Party (B number).  
 § Call Start (date and time).  
 § How long the call was (duration).  
 § Call Type (Voice, SMS, Data etc.).  
 § Peak/Off-Peak Marker  
 § A unique sequence number identifying the record.

**Out come**

v A light weight micro service based Restful API to read customer’s usage information from the database and transform the information in a an aggregated fashion as described above.   
 v Custom JavaScript which will make use of chart.js to transform the JSON data in a graphical format.  
 v De-Normalized usage table structure that would be the input source for the Restful API   
 v A presentation which describes the concept of telecom customer data model from both residential and business segment point of view.  
 v A presentation describing the overall flow of the above project.