Data Analytics for Employees Dashboard to Improve Efficiency and Performance of Employees

Thesis submitted in partial fulfillment of the requirements of degree
Of

Master of Technology

In

Computer Science and Engineering

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CERTIFICATE

I hereby certify that the work which is being presented in the thesis entitled, **"Data Analytics for Employees Dashboard to Improve Efficiency and Performance of Employees."**, in partial fulfillment of the requirements for the award of degree of Master of Engineering in *Computer Science and Engineering* submitted in Computer Science and Engineering Department of Thapar Institute of Engineering and Technology, Patiala, is an authentic record of my own work carried out under the supervision of Manager **Mr. Puneet Kori** and Guide ***Dr. Parteek Bhatia*** and refers other researcher's work which are duly listed in the reference section.

The matter presented in the thesis has not been submitted for award of any other degree of this or any other University.

Signature: Rishem

This is to certify that the above statement made by the candidate is correct and true to the best of my knowledge.

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ABSTRACT

It is a Test Platform Usage Dashboard, as it is a Test Platform, the Higher Management should be enabled to view how effectively being utilized, relocate the underutilized platforms to areas in need. Increasing the resource utilization and effectiveness, thus reducing the cycle time and saving costs.

However, the Management did not have access to view, utilize and relocate the underutilized platforms to areas in need.

CNE is internally developed Test Platform. Test Platform is costly and scare resource. With this dashboard we are enabling the higher Management to view how effectively being utilized, relocate the underutilized platforms to areas in need. Increasing the resource utilization and effectiveness, thus reducing the cycle time and saving costs.

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1.1 Introduction:

It is a Test Platform Usage Dashboard. As it is a Test Platform, the Higher Management should be enabled to view how effectively being utilized, relocate the underutilized platforms to areas in need. Increasing the resource utilization and effectiveness, thus reducing the cycle time and saving costs.

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With this dashboard we are enabling the higher Management to view how effectively being utilized, relocate the underutilized platforms to areas in need. Increasing the resource utilization and effectiveness, thus reducing the cycle time and saving costs.

FRONT END: .1. JAVA SCRIPT AND ANGULAR JQUERY.
2. HIGH CHARTS.

DATABASE: SQL SERVER MANAGEMENT STUDIO 2017 VERSION

BUSINESS: 1. C# .NET FRAMEWORK.
2. ASP.NET(MODEL VIEW CONTROLLER WEB API).

INSTALLATION:

1. INTERNET INFORMATION SERVICE(IIS).
2. VISUAL STUDIO 2017.
3. SQL SERVER MANAGEMENT STUDIO 2017(SSMS).

1.2 FRONT END

1.2.1 JavaScript

Javascript is the programming language comprises of basically two languages.

It has following features-

-High level language.

-Dynamic.

-Weakly typed.

-Prototype based.

-Multi-paradigm.

1.2.2 Angular JQuery

JQuery is a DOM manipulation library that makes it easier to use JavaScript on your website.Javascript is the language of choice for making webpages dynamic and interactive.JQuery takes the complex code that would be required to make AJAX calls or manipulate the DOM and wraps them into simple methods you can call with a single line of JavaScript.

Here are some of the key technical features that are available in the JQuery library:-

-**HTML/DOM manipulation**

-CSS manipulation

-AJAX/JSONP

-Event Handling

-Effects and animations

-Cross-browser compatibility

-Lightweight(minifies and gzipped)

JQuery makes no assumptions about your web technology stack,and may be used in conjunction with other frameworks,including Angular JS.Infact,Angular JS is built off and implementation of JQuery calles jqLite.Since jQuery has no real structure,the developer has full freedom to build projects as they see fit.However the lack of structure also means it,'s easier to fall into the tarp of code which can lead to confusion on larger projects with no clear design direction or code maintainability.For these situations,a framework like AngularJS can be a big help.

1.2.3 HIGHCHARTS

It is a JavaScript charting library used to enhance JavaScript Web applications.

It provides a wide variety of charts ie-

-Line Charts.

-Spine Charts.

-Area Charts.

-Bar Charts.

-Pie Charts.

1.3 SQL SERVER 2017 VERSION

SQL Server is Relational Database Management System like edition developed by Microsoft.Various editions available are-

-Enterprise

-Web

-Business Intelligence

-Express

-Azure

-Evaluation

- FastTrack

- LocalDB

-Analytics Platform System(APS)

-Dataware house Application Edition

-MSDE

-Personal Edition

-DataCenter

1.4 C# .NET FRAMEWORK

.NET FRAMEWORK BASIC ARCHITECTURE

.NET Framework is as shown below-

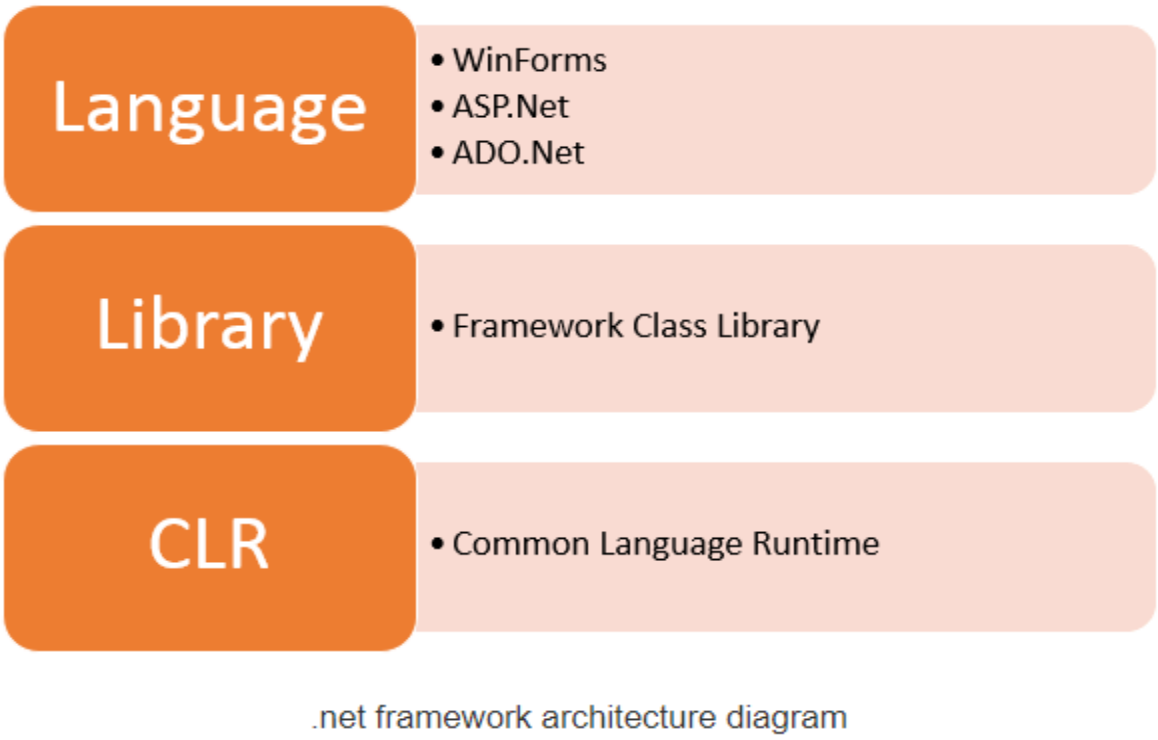


Figure 1.1 Architecture

ASP.NET

ASP or Active Server Pages.It is framework which is used for building Web pages.

Functions-

-It processes pages to produce dynamic output.

-Pages can be instantiated and processed easily.

-It compiles the pages dynamically.

ADO.NET

ADO or Active Data Objects is a framework to interact with databases as well as XML files. It connects various databases and objects associated with them. It allows various classes and methods for retrieval and manipulation of data.

1.5 INTERNET INFORMATION SERVICE (IIS)

Internet Information Services (IIS) is an extensible web server created by Microsoft for use with the Windows NT family. IIS supports HTTP,HTTP/2,HTTPS,FTP,FTPS,SMTP and NNTP. It has been an integral part of the Windows NT family since Windows NT 4.0 though it may be absent from some editions.

1.6 VISUAL STUDIO 2017 VERSION:

It enables us to write code accurately and in an efficient manner. It is basically an IDE from Microsoft. It is used to build websites, web services etc.

Features-

-Development.

-Debugging.

-Testing.

-Collaboration.

It provides solutions for following platforms or applications-

-Windows.

-Mobile Applications.

-Web Applications.

-MS Office Applications.

Technologies –

-C++

-Node.js

-Python

-R

-.NET

-JavaScript

CHAPTER 2 RELATED WORK

2.1 Existing Work

2.1.1 My Research Dashboard

It is a dashboard which shows downloaded activities,shares,citations and graphical visualizations and how they can be published are discovered in this dashboard.

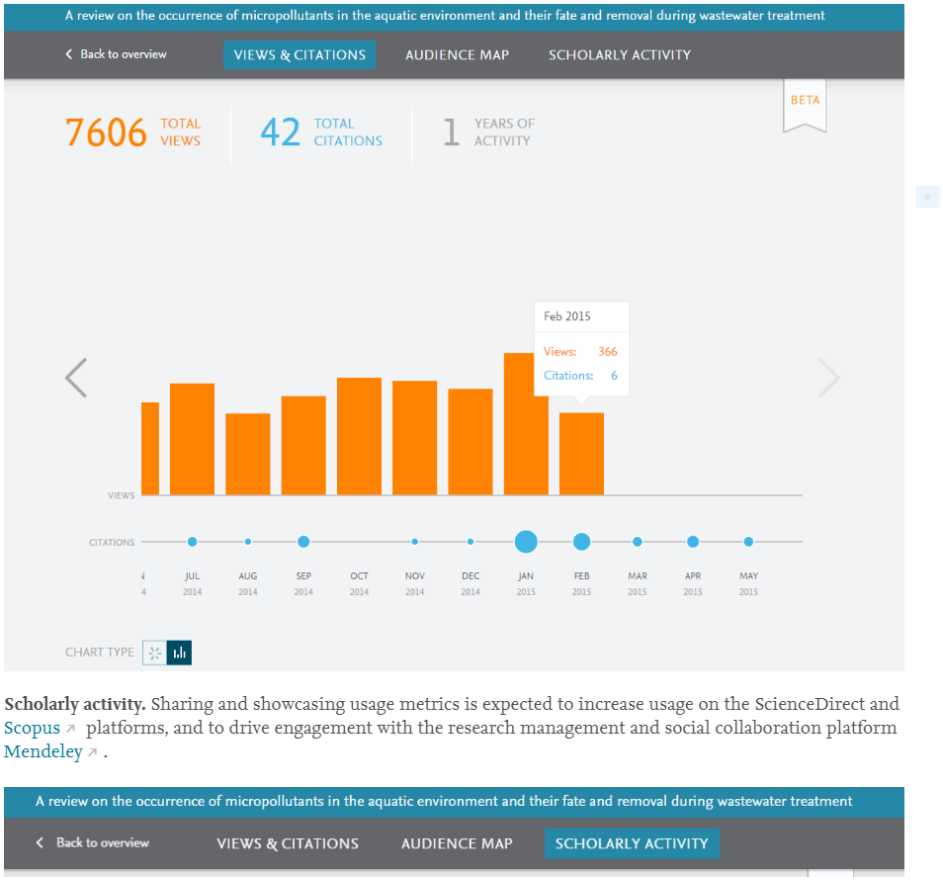


Figure 2.1 My Research Dashboard

When we register in this dashboard, it can be viewed by only us. No one can see it.It provides instructions, tips and guidelines for sharing results and publications with peers via social media etc.It combines data from different platforms to create tools and services for researchers to have control on all information.

2.1.2 Stats Dashboard

It provides following features-

- Visualisations of various activities.

-It provides latest process to be started.

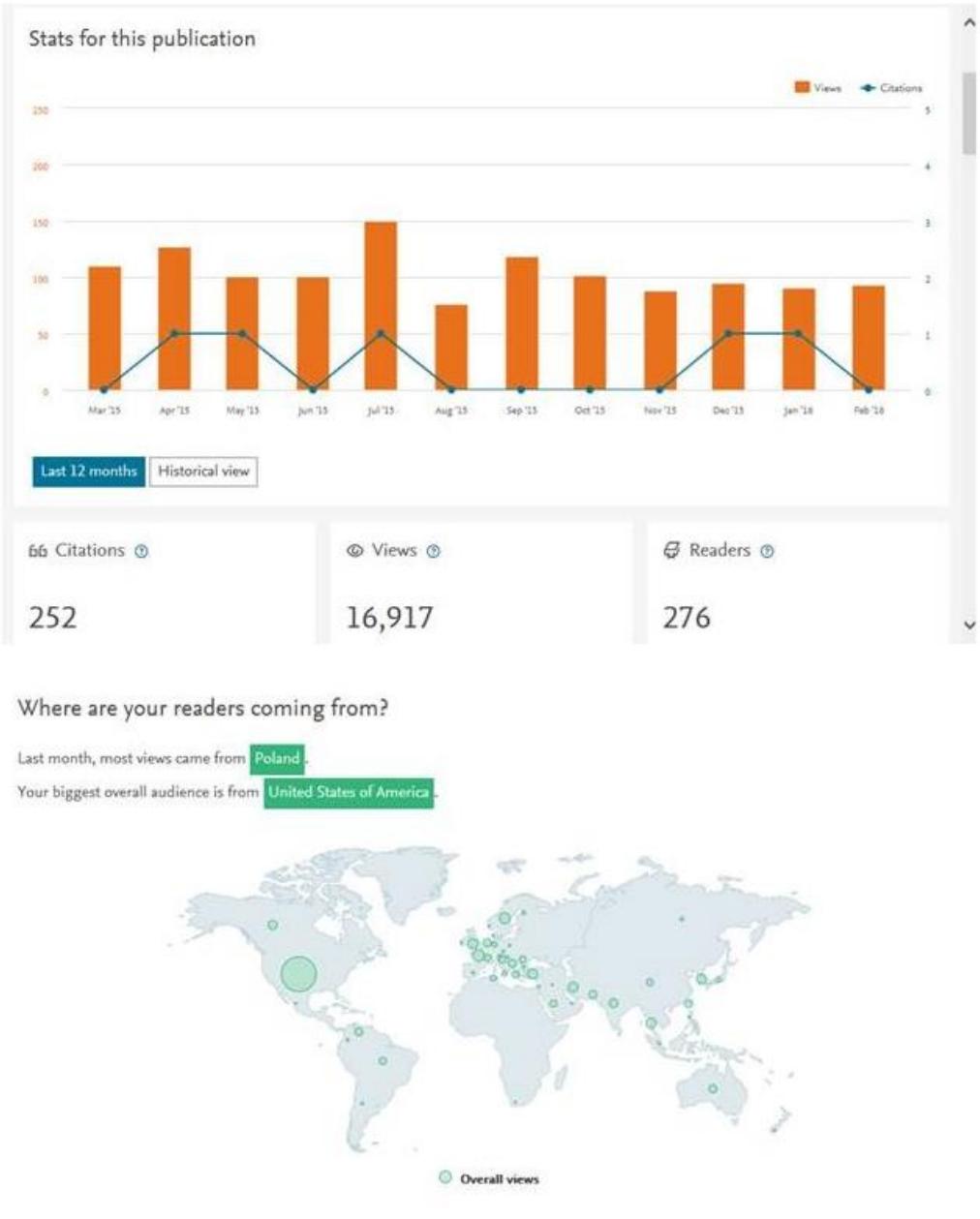


Figure 2.2 Stats Dashboard.

2.1.3 Class Utilization Dashboard

Steps to create-

1.Start from the End:

We looked at various classroom utilization dashboards and developed one that fits our need.

2.Need for Key Performance Indicators(KPI)S buy in:

We reviewed University of Minnesota's Classroom Utilization dashboards and adopted their KPIs. We met with our stakeholders and received their approval on the various KPI's.

3.Data Preparation in the Key:

We created a SAS program to deliver a SAS dataset that has comprehensive and calculated data with fields that we require in our Dashboard.

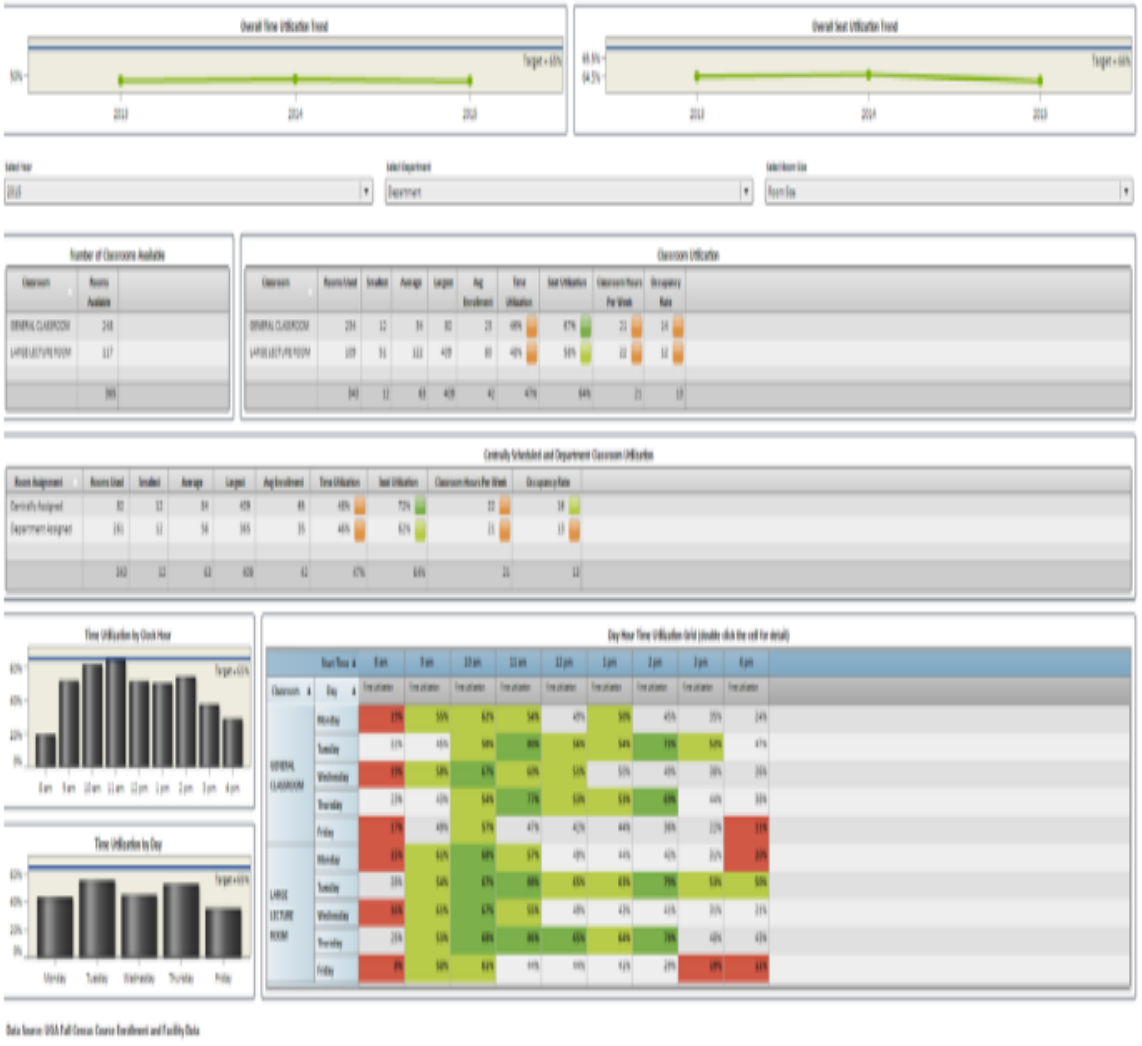
i)Loading data in SAS Visual Analytics:

We can load the SAS dataset prepared in step 3 in SAS Visual Analytics.

ii)Dashboard Creation:

We used SAS Visual Analytics Report Designer module and created various charts and tables based on step 1 above. We went through multiple iterations of steps 3,4,5 to reach a stage where we were confident to provide a demo to our stake holders and receive their feedback.

Figure 2.3 Class Room Utilization Dashboard



2.1.4 Diversity Dashboard

It includes all the features included in a college level just like all courses available in a college.

-Undergraduate student details.

-Graduate student details.

-Medical student details.

-Humanities group students.

-Arts students.

-Social science students.

-Physical students etc.

CHAPTER 3: PROBLEM STATEMENT

3.1 Problem Statement

It is a Test Platform Usage Dashboard.As it is a Test Platform, the Higher Management should be enabled to view how effectively being utilized, relocate the underutilized platforms to areas in need. Increasing the resource utilization and effectiveness, thus reducing the cycle time and saving costs.However, the Management did not have access to view, utilize and relocate the underutilized platforms to areas in need.CNE is internally developed Test Platform. Test Platform is costly and scare resource.With this dashboard we are enabling the higher Management to view how effectively being utilized, relocate the underutilized platforms to areas in need. Increasing the resource utilization and effectiveness,thus reducing the cycle time and saving costs.

3.2 Objectives

-To design and develop the dashboard for test platform interface.

- To relocates the underutilized platforms to areas in need.

-To increase resource utilization and effectiveness.

-To reduce cycle time and saving costs.

-To test the proposed interface on real data.

-

CHAPTER 4: ARCHITECTURE OF SYSTEM TO BE PROPOSED

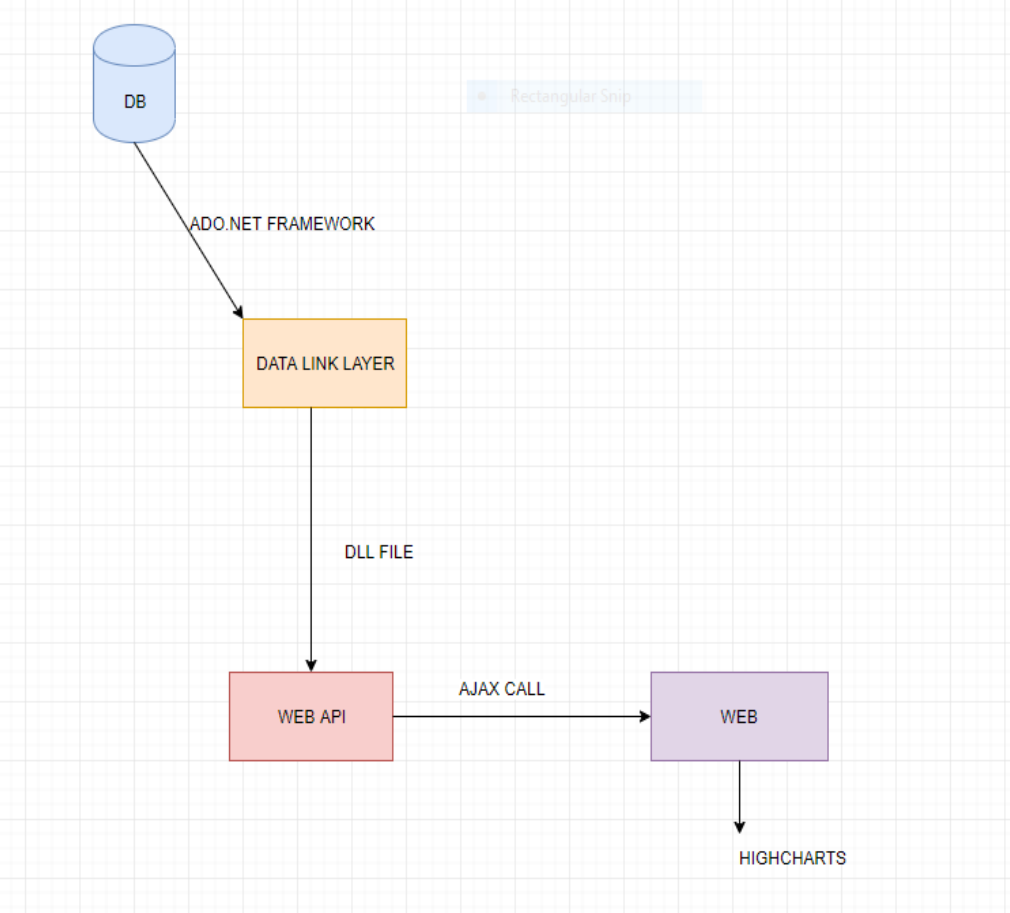


Figure 4.1 Architecture

As described by Block diagram itself, first of all a CNE Database is provided to us and our objective is to make a Dashboard for it using SQL Database and run the various

queries on it which we want according to the particular parts ie according to Tests or DUTs to present them on HighCharts.

1.First of all we run the SQL Queries on SQL Server Management Studio 2017 version according to our need ie. whether to present Groups or DUTs from the database provided to us. After running them successfully, according to us the Tables which we want came infront of us ie .for first Dashboard we want only count of number of Testids.Testids in these cases are unique numbers associated to them.and corresponding to them there is name of Groups associated to them as we want in our first Dashboard screen.

2. Secondly,now we have to open Visual Studio 2017 version to code this Web work.

3. After opening Visual Studio 2017 version, we have to build various coding files in our VS.these are discussed as under-

4.1 -CNE.BUSINESS

4.2 -CNE.DAL

4.3 -CNE.MODEL.ADO.NET

4.4 -CNE.UTILITY

4.5-CNE.WEB

4.6 -CNE.WEBAPI

4.1-CNE.BUSINESS

This file includes all the business logic used in the work. There is a file named as CNE.BUSINESS.cs file which includes all the business logic between the Web API and Web.

4.2-CNE.DAL

It is a Data Access file. Data accessing is done here. There is a Data Access file.cs here. In this file all logic is done regarding 3 tier Architecture of Data Accessing.

4.3- CNE.MODEL.ADO.NET

There is a CNEDATA.cs file here. In this file, all the CNE Data is here and it uses ADO.NET Framework to be utilized in this work.

4.4-CNE.UTILITY

It is provided I the work for utilization purposes.

4.5-CNE.WEB

It is the main file in this work on which a website is being deployed.

There is an App-Start folder in this file.

-We have to change in Route Config.cs file.

-Regarding Scripting, in Scripts folder, we have to write our own code in javascript file namely CNEDATA.js file. There there is a AJAX call.

Also,in CNE.WEB File, in Views Folder, in Home Folder page, there is a change in Index.cshtml file,where we have to include all Route Config.cs files folders dropping location ie URL path should be there also it includes others contents dropping URLs ie. AJAX call in it ,CNEDATA.js file in it the URL of it.URL of Index.cshtml file etc are all included in this folder.

4.6-CNE.WEB.API

There is a WebAPIConfig.cs file.HERE only the entire website is deployed. So

We have to make our own Controller ie I make it ie- Group Controller.cs.

CHAPTER 5- RESULTS AND ANALYSIS

5.1 Methodology:

As it is a Web Development work ,so I basically make six (6) files in Visual Studio 2017 version. These are as following-

-CNE.BUSINESS

-CNE.DAL

-CNE.MODEL.ADO.NET

-CNE.UTILITY

-CNE.WEB

-CNE.WEBAPI

CNE .BUSINESS

This file includes all the business logic used in the work. There is afile named as CNE.BUSINESS.cs file which includes all the business logic between the Web API and Web.

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CNE.MODEL.ADO.NET

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CNE.WEB.API

There is a WebAPIConfig.cs file. Here only the entire website isdeployed. So we have to code here in this file only.We have to make our own Controller ie I make it ie- Group Controller.cs as I have to sort the data provided in database according to groups.so we have to code here only.Also there is a WEB.Config file in this particular folder included in it. It includes all Web settings included in it.

5.2 Results

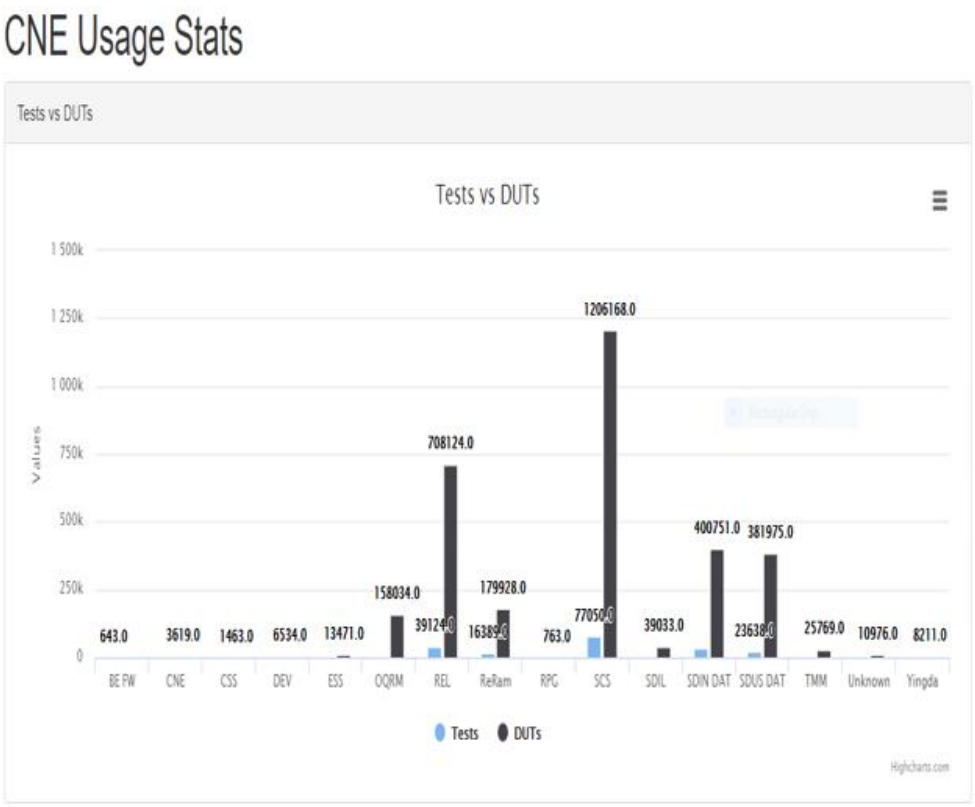

Figure 5.1First Dashboard- It is based on No. of Tests to Number of DUTs.

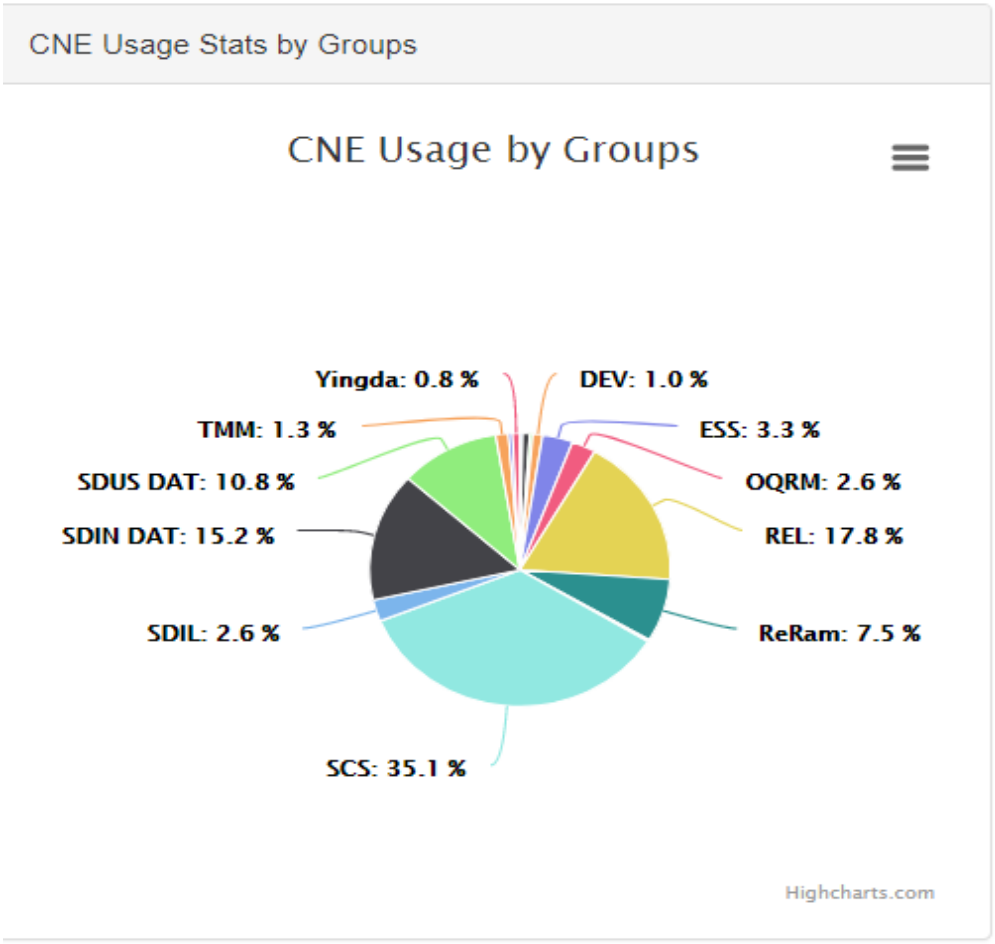

Figure 5.2 Second Dashboard- It is based on Groups percentage.

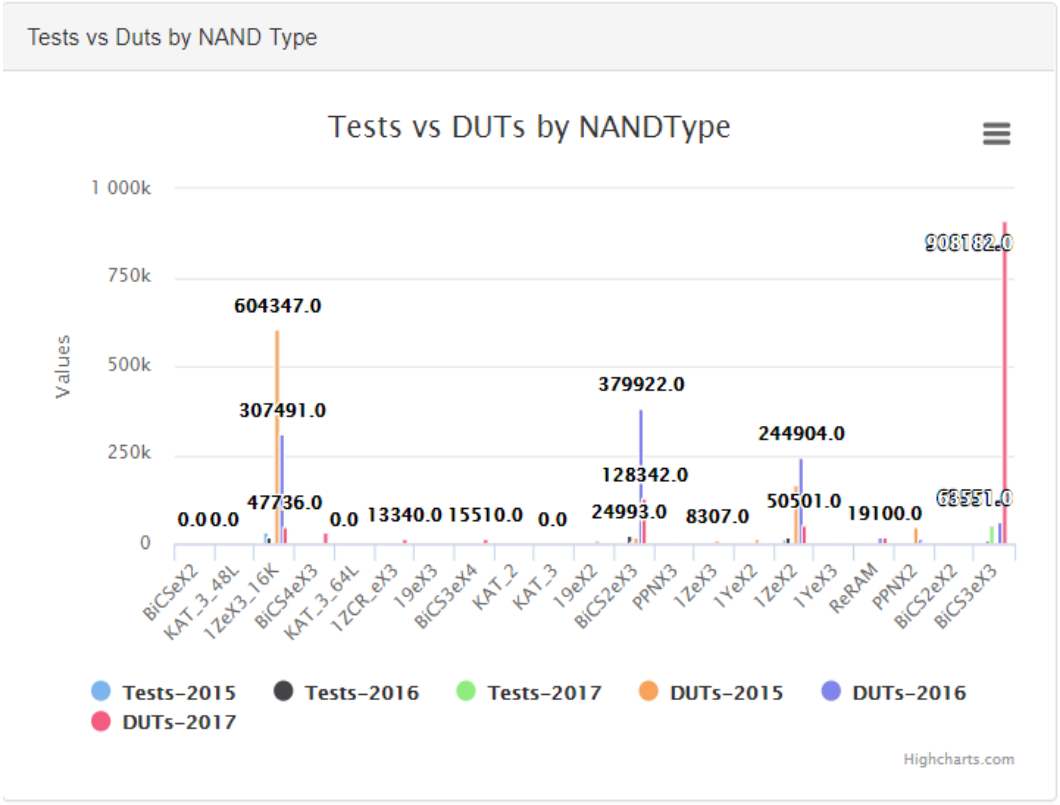

Figure 5.3 Third Dashboard- It is based on No. of unique test ids to No. of DUTs count by NAND Type.

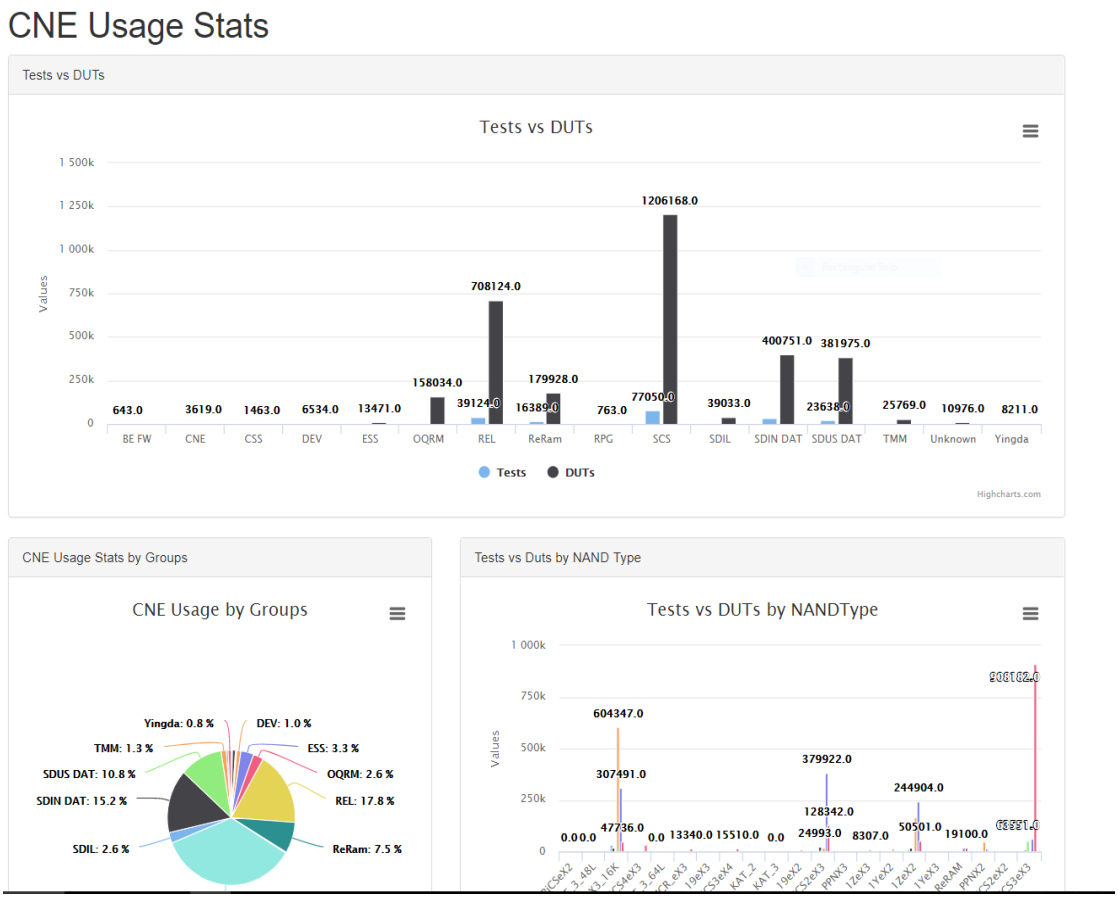

Figure 5.4 Full View of the CNE Dashboard built.

CHAPTER 6: CONCLUSION AND FUTURE SCOPE

It is a Test Platform Usage Dashboard.As it is a Test Platform, the Higher Management should be enabled to view how effectively being utilized, relocate the underutilized platforms to areas in need. Increasing the resource utilization and effectiveness, thus reducing the cycle time and saving costs. CNE Dashboard is doing that work and make up with the need.

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