

Analysis and Design of Visualization of Educational Institution Database using Power BI Tool

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Abstract

Visualization of data set is a process of making understand the significance of data through visual context and part of data analytics where it's executed after the data correction. Nowadays visualization is more useful in business intelligence and Analytics in every field, There are different techniques for visualizing the datasets, it may be in dynamic or interactive nature, and datasets can be visualized in different types of visuals insights, This paper deals with the interactive visualization of educational institution database using Microsoft Power BI Tool with different modules and this paper focuses on process model, operations of Microsoft Power BI, types of data sources available in Tool and its different related types of visual insights or context.

Index terms— analytics, visualization, business intelligence, insights.

1 Introduction

connectors and protocols, Power BI Desktop is the component in Architecture where the data is analyzed and transformed through some procedure using tools and made to report on the web by means of several visuals, tools and publish feature. There are two types of visuals in power BI. 1) Microsoft Visuals, 2) Custom Visuals.

2 1) Microsoft Visuals

These are the official visuals from Microsoft, and some were built-in visuals in power BI installation package.

They are secured in nature and following are the official Visuals of Microsoft such as Stacked bar chart, line chart, Waterfall chart, Area Chart, Clustered Bar chart, Slicer, table, and Matrix?etc.

3 2) Custom Visuals

These visuals contexts are developed by the third party or the end users such as developers and these are shared among the users through the portal like office store and git Hub. They are unsecured in nature and following are the Custom visuals provided by third party and Microsoft officials such as dot plot, route map, flow map, journey chart, and scroller?etc. e) Visualize: In this step, the analyzed and processed data is visualized through means of visuals such as Microsoft Power BI Visuals and Custom Visuals like plots, graphs, slicer, KPI...Etc. After this process, the report is published to power BI services.

f) Editing: In this step, the published report on to web is finalized after rectifying errors for any changes such as if any filters or visuals need to solve and after completion of the editing process, the report is made to publish on the web.

g) Web: As said above step, it is a state where the report is converted into the dashboard, and it can be share-able via URLs, websites. Etc. Details of Data Sources

4 Literature Reviews

Marija Blagojevic et al. [1] studied on web-based intelligent report of e-learning system by using the technique of data mining and it deals about PDCA method such as (Plan, Do Check, Act) for improving the web-based intelligent reports of eLearning system by means of data mining techniques and concluded that their proposed system has an improvement since it predicts behavior patterns thus leading to the increase in count of participants and in there study ,it proved that their proposed system has improvements in terms of report system in the field of LMS (learning management system) or e-learning . Moreover, the development and implementation of new modules.

Daniel J.Power [2]studied the data-driven decision support system and it deals with data-driven decision support system and its advantages at Business Intelligence and concluded that mainframe-based decision support systems would need to be updated or replaced by web-based or web-enabled systems the accessibility reach for data-driven decision support systems are open source software's, new hardware's, web technologies, etc.

Zhijun Ren [3] studied the delivering of a comprehensive Business Intelligence solution using Microsoft Business Intelligence stack and it deals about features and advantages of business intelligence stack of Microsoft and concluded that by integrating several technologies such as database, connectors, SharePoint servers, and business intelligence tools will lead to Faster delivery of comprehensive business intelligence solution within an enterprise

Guangzhi Zheng et al. [4] studied on business intelligence to healthcare informatics Curriculum and their paper deals with the preliminary analysis of integration of Business Intelligence with Healthcare Information Technology and concluded that Business Intelligence had been a neglected part in many healthcare information technology programs yet both the industry and academia have realized the importance of Business Intelligence

Michelle Hoda Wilkerson et al. [5]done work on youth reasoning with interactive data visualization and it deals with the youth understanding of data by interactive data visualization, they concluded that supporting learners in the coordination of any resources they choose to leverage is more likely helpful than supporting a particular approach or sequence of resource use

Yuri Vanessa Nieto et al. [6]done a work on academic decision-making model for higher education institutions with the help of learning analytics .it deals with modeling and construction of software architecture for creating and categorizing indicators and they concluded that proposed software architecture has benefit of providing integration of learning analytics indicators and supports decision making in universities.

5 VI.

6 Methodology

In Power BI, the different types of data are fetched by means of getting data function from different data sources and the different data sources are Files, Database, Azure, Online Services and other, the detailed description of data sources as shown in details of data sources After selecting the Data sources, we have to get the data by means of queries (if the data source is other than files) or selecting files from folders. The data will be loaded in the Power BI tool and before making the report in the power BI tool, the uploaded data should be Analysed and Corrected for error freed data through edit queries function in data part of Power BI tool and we can have relations between different datasets by means of relationships part, As the option is seen at the left side of the power BI tool, if we required any conditional columns or to add new data in datasets by means of edit queries function we can proceed it and next step is to make report by means of clicking on report option and white empty sheet appears on the screen where we create our own report. The analyzed and corrected data is visualized by means of different Visuals such as Custom Visuals and Power BI Visuals such as stacked bar chart, stacked column chart and by means of Publish option the report is published on the Power BI Services. We have to log in to power bi services, if required we can do any editing operations otherwise the report is made into the dashboard by means of publish on the web

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Volume XVIII Issue IV Version I As shown in the Pseudo code Algorithms 1,2, and 3 for different modules, Firstly the tool Programme is started and required data such as P i , P ii , P iii in Algorithms 1,2 and 3 are captured into the tool from different data sources via getting data function and dataset is viewed if any corrections to be done for selected data and then data is initialized with multiple columns such as P at , P t1 , P t2 , P ha , P q , P ch , P ca , P Api , P am ,P id , P na , P up , P Qf , P br , P st , P cn , P lp as shown in Pseudo-Code 1,2,and 3 respectively where different datasets contain a different number of columns. If required Uploaded dataset is processed by means of string operations, otherwise by means of queries conditional columns are created in datasets using edit queries as shown in pseudo code 1 and 2 with mathematical and conditional operations and then the dataset is Visualized through Microsoft Power Bi Visuals, by visualization of datasets report process is completed and then it is published to power BI Services by means of Publish function in the tool. After Publishing the report into the services of Power BI, the report is made into the dashboard by means of clicking publish on to web function in the file tab and then generated link can be shareable to anyone, it can be share to individuals of organization by means of Uniform Resource Locator (URL) directly or indirectly by means of SharePoint, Website,..Etc., as shown in the Results and discussion section.

8 VII.

9 Results and Discussion

After publishing the dashboard to the power BI services it appears as shown in below figure and we can have some editing operations if any filters or visuals are not properly accessible then they can be rectified here before publishing on to the web. Not only above discussed modules, we can have dashboards of different modules of every educational institution, it may be related to staffs, Infrastructure and other Amenities of institutions...Etc. following are the results of dashboards of discussed modules of educational Institutions.

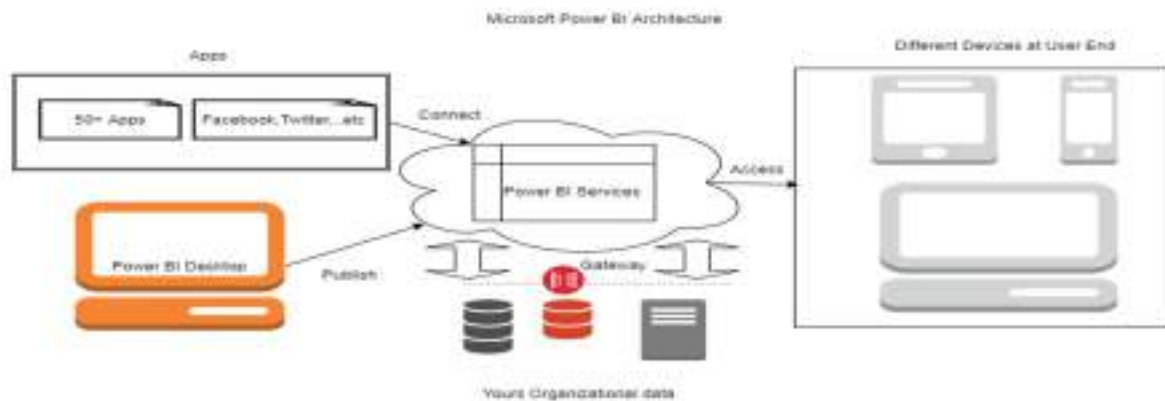


Figure 1: Fig. 1 :

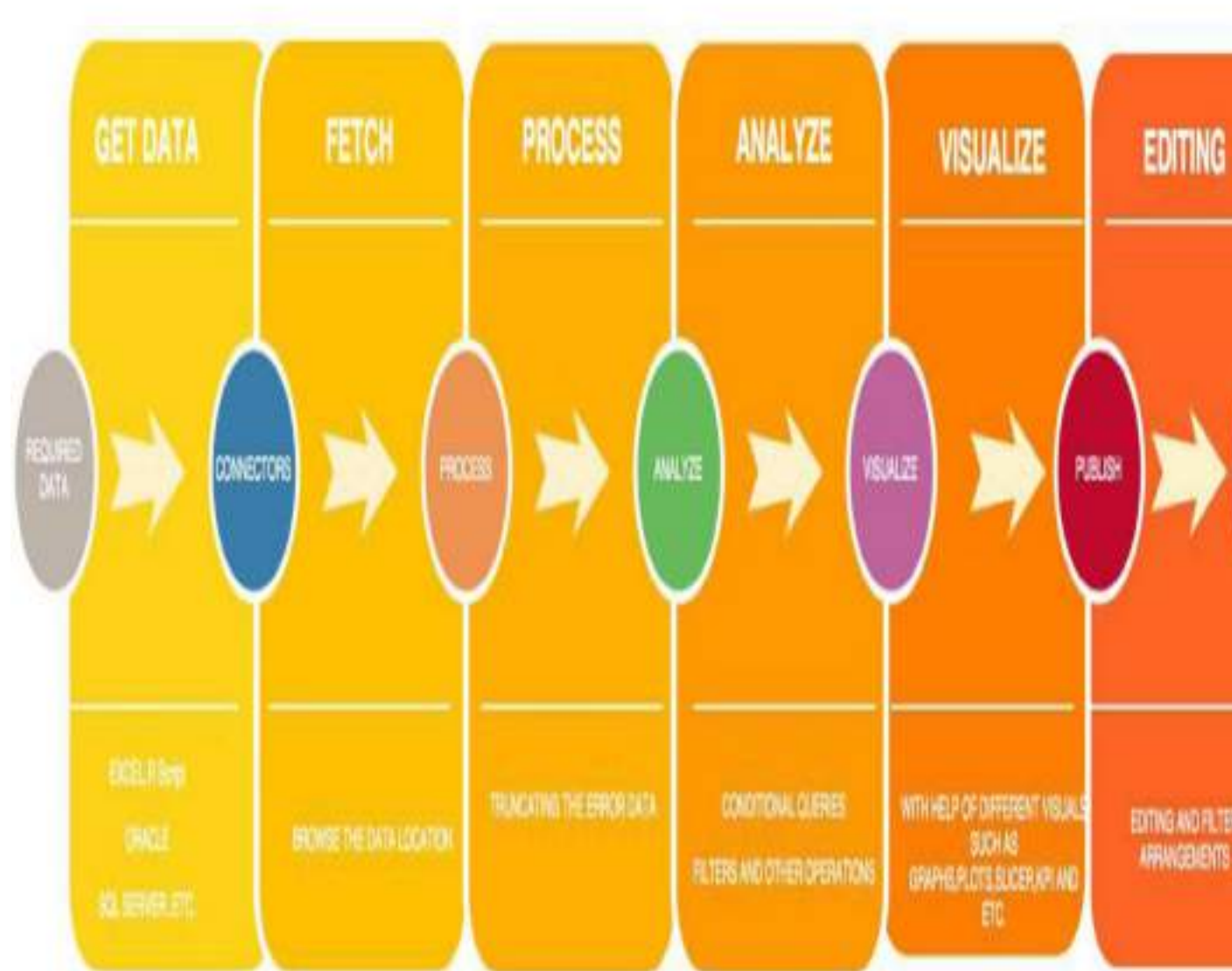


Figure 2: a)

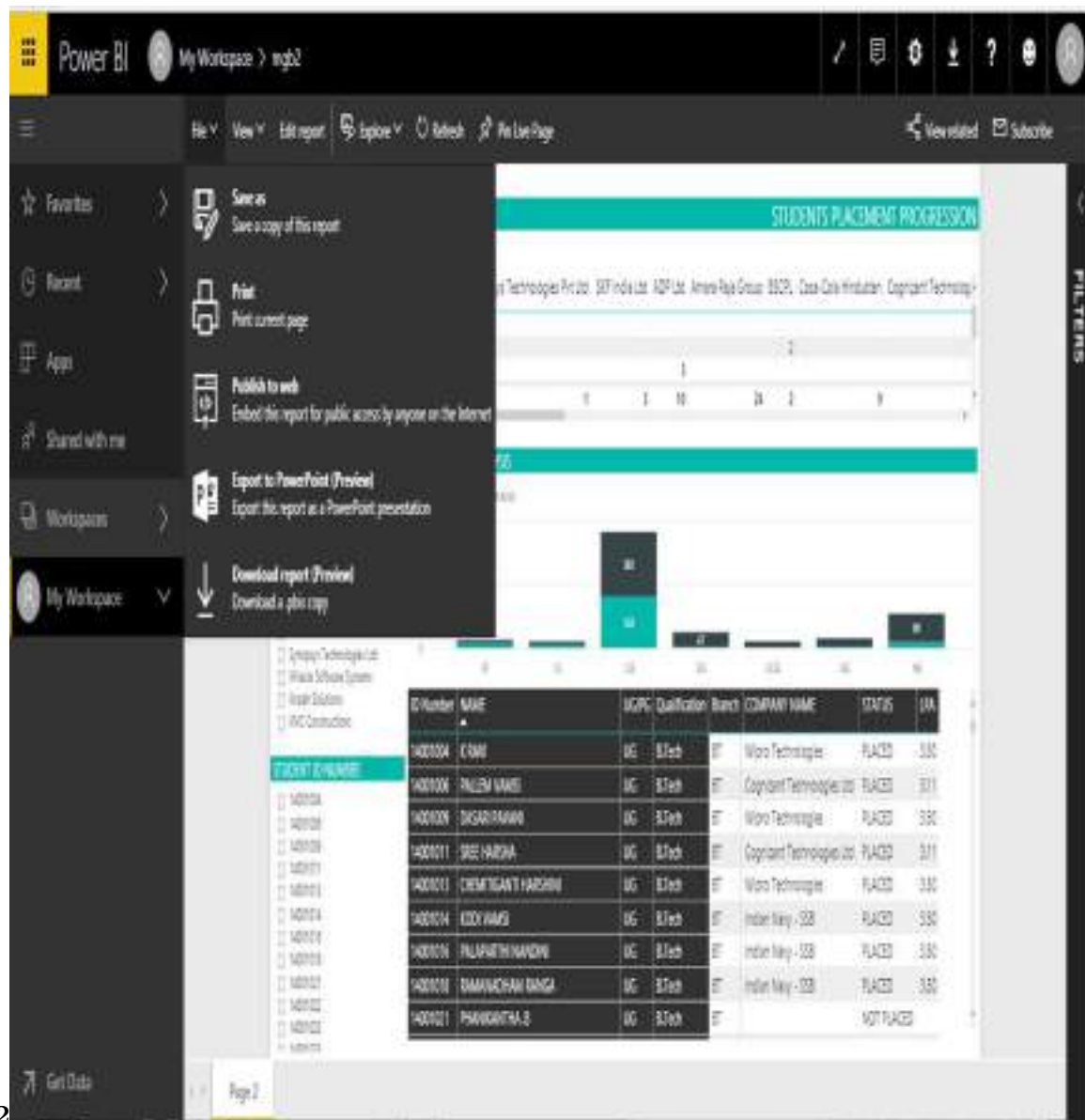
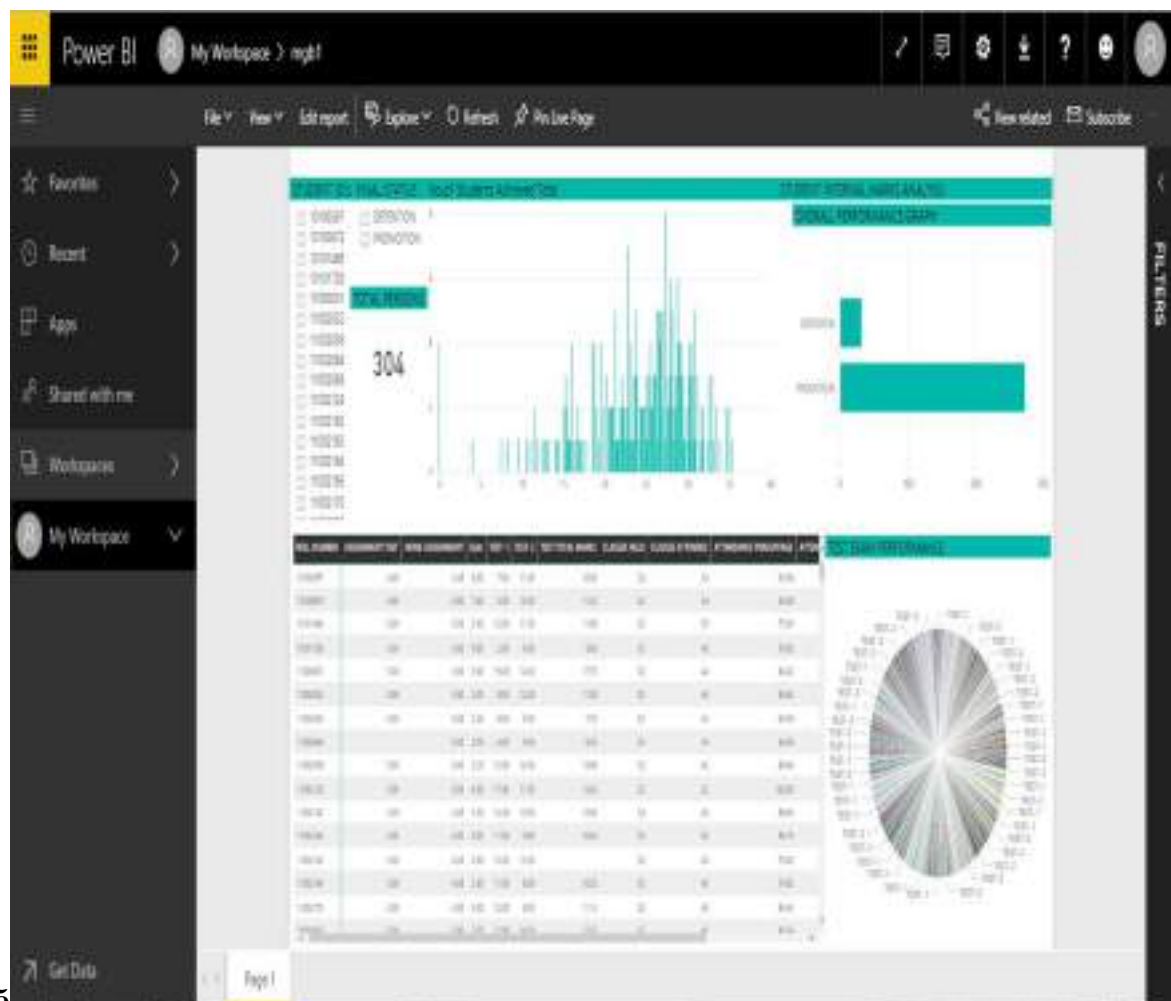


Figure 3: Fig. 2 :



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Figure 4: Fig. 3 :Fig. 4 :Fig. 5 :

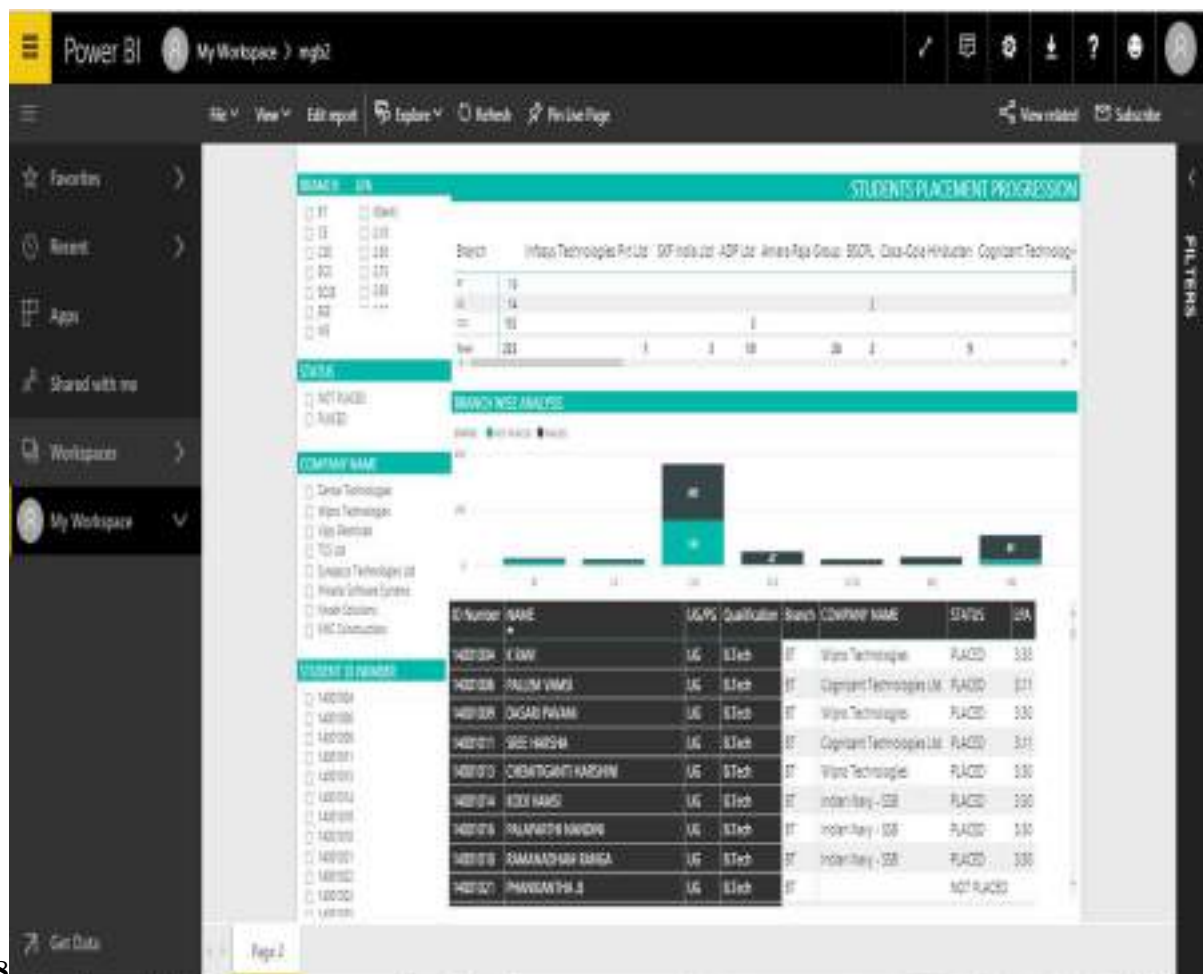




Figure 7: Table 1 :

Data Format

Files

Data

Sources

Excel, Text/CSV, XML, JSON, Folder, Share Point Folder

Pseudo Code Algorithm 3:

C Database Azure Online Services Other Pseudo Code Algorithms: SQL SERVER, ACCESS, ORACLE,

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Global Else If P ap ≥ 90 , Else If P ap ≥ 85 , Else If P ap ≥ 80 , Else If P ap ≥ 75 , Create new column P t

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Else If P ap < 65 , Detention

Else If P ap > 75 & P ap ≤ 100 , Promotion

Else Condonation Else Error

If P

ap

≥ 65 & P

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≥ 16 & P

ap

< 75 ,

Create new column P ape

[Note: functionality]

Figure 8:

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