Introduction

This document provides detailed information about the powerBI dashboard which is created to provide insights on monitoring projects, Budget and timeline over the time.

Data Analysis

While inspecting the raw data, I found few data anomalies which needs to be addressed before loading into powerBI. The following scenarios explains how these anomalies were handled before designing dashboard.

1. **Missing Data:**
    a. The following snapshots shows missing data for few **Target_Date, Projected_Date and Actual_date** columns in Milestone table.

A	B	C	D	E	F	G	H
Project_Code	Project_ID	Start_Date	Initiation_Date	Project_End_Date	Project Manager	Design Manager	Team
XX21-0001	1	Sunday, February 21, 2021	Sunday, May 9, 2021	Wednesday, September 29, 2021	Mendy O'Lagen	Penni Gronous	X
XY20-0001	2	Friday, January 15, 2021	Tuesday, January 15, 2019	Wednesday, June 1, 2022	Susanna Muffitt	Stefa Yellowley	X
YY21-0008	3	Tuesday, September 28, 2021	Monday, August 2, 2021		Ardelia Brombell	Georgia Kebell	Y
YY21-0015	4	Wednesday, July 14, 2021	Wednesday, December 15, 2021		Charlot Cockrem	Sadie Strange	Y
XY21-0019	5	Wednesday, October 20, 2021	Friday, October 15, 2021		Shelby Stebbins	Pamella McFeate	X

Resolution: This date data will remain null for missing values assuming they are not yet updated. This data will show blank in the dashboard to avoid losing information.

2. **Duplicate Data:**
    a. There are few records in project_Budget table whose data looks duplicate in the table as shown below. But when I closely look, for every record, there is an associated record in Project_Committed table for that specific ScopeID with different values. So, I concluded that this is not a duplicate data instead it is actual Budget that has allocated twice and committed twice.

5	1094	00 - Design	Design Costs DSPV	57992	2/24/22
5	1094	00 - Design	Design Costs DSPV	57992	2/24/22
3	1104	06 - Wood & Plastic	Solid Surface countertops	18400	12/21/21
3	1104	06 - Wood & Plastic	Solid Surface countertops	18400	12/21/21

1094	57992
1094	57992
1104	53888
1104	25911

Resolution: I added both the data with same project_id,scope_id and division in both project_Budget and Project_Committed table.

3. **Junk Data:**
    a. There are few date records whose values are generated randomly or out of context.

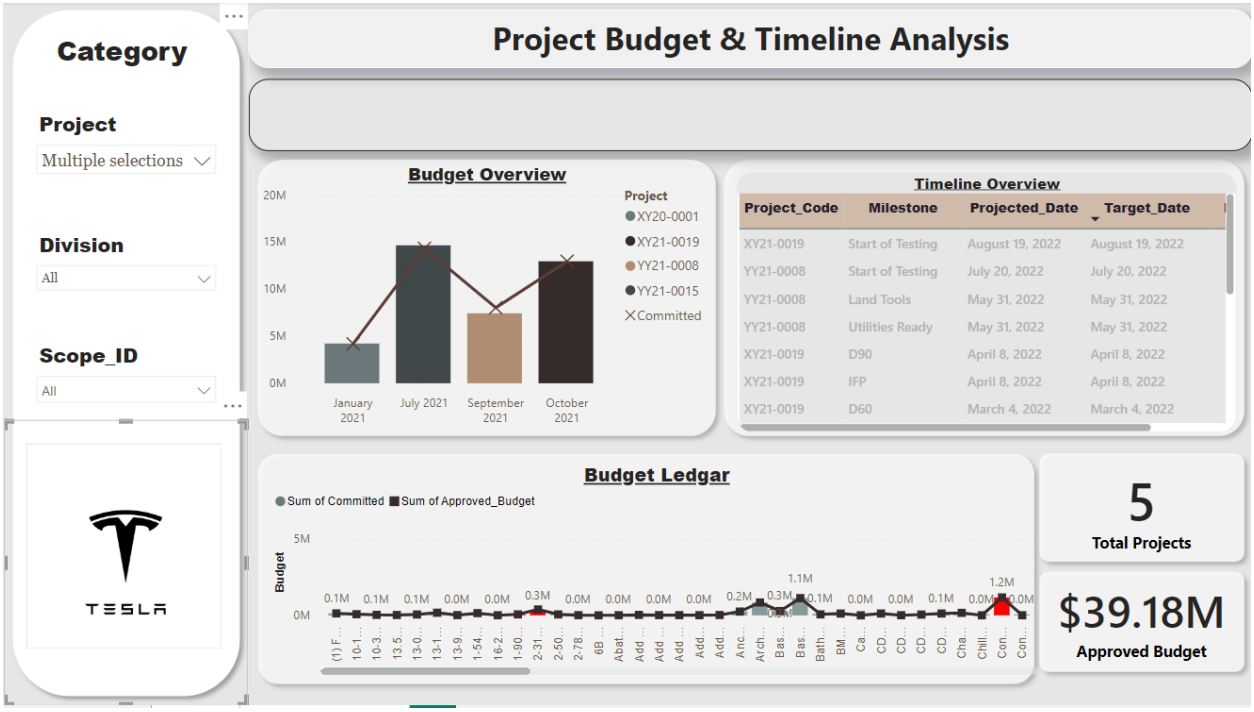
3 EQL/Space Plan	Thursday, October 21, 2021	1/0/00

Resolution: I changed those records to null if the actual date is less than Target_Date.

Dashboard Designing

1. **Data Loading and Transformation:**

First, I loaded the data into PowerBI data loader than I made transformations to data to handle Data Anomalies. These transformations are done by creating new tables on top of existing tables using DAX. Following are the DAX queries I used to create tables followed by ER Diagram.

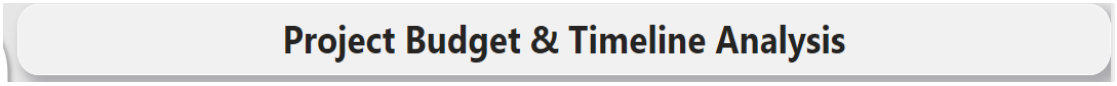


2. **Dashboard Layout**

Dashboard Consists of few visual representations in which few controlled by slicers/filters, and few are static.

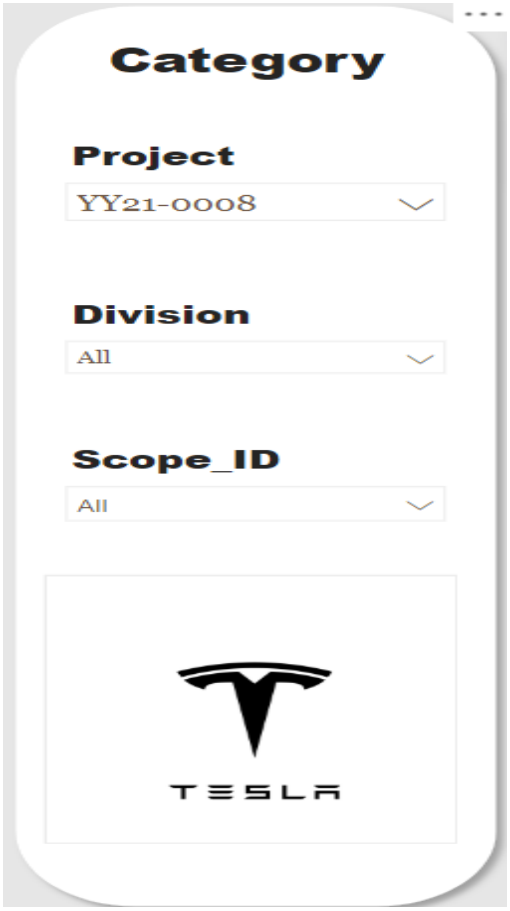
a. **Title Block:**

This provides what exactly the page describes.



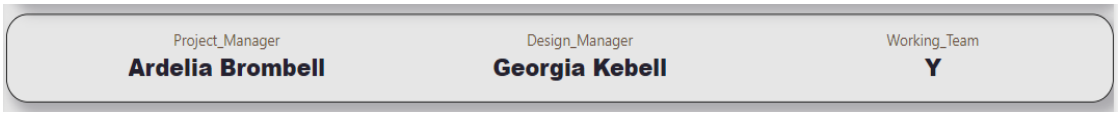
b. **Slicers Block:**

This block having all the slicers/filters to visualize user query specific data.
The logo will reset the slicers and select all values by default. This can be used for quick refresh of slicers.



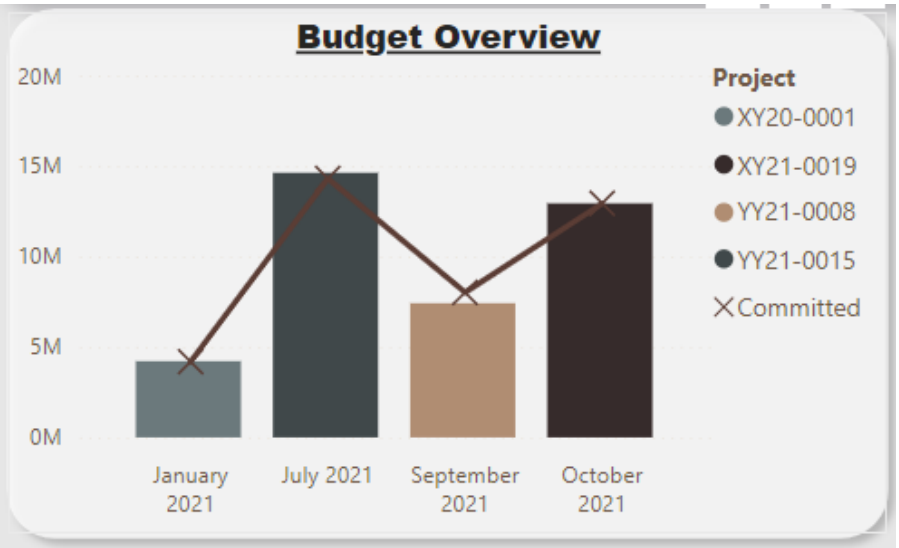
c. **Project Details Block:**

This Blocks shows details about Project like, Project manager, Design Manager and Team which is working on that Project.



d. Budget Overview:

This block consists of visual representation of budget allocated and committed for projects over the time.



e. Timeline Overview:

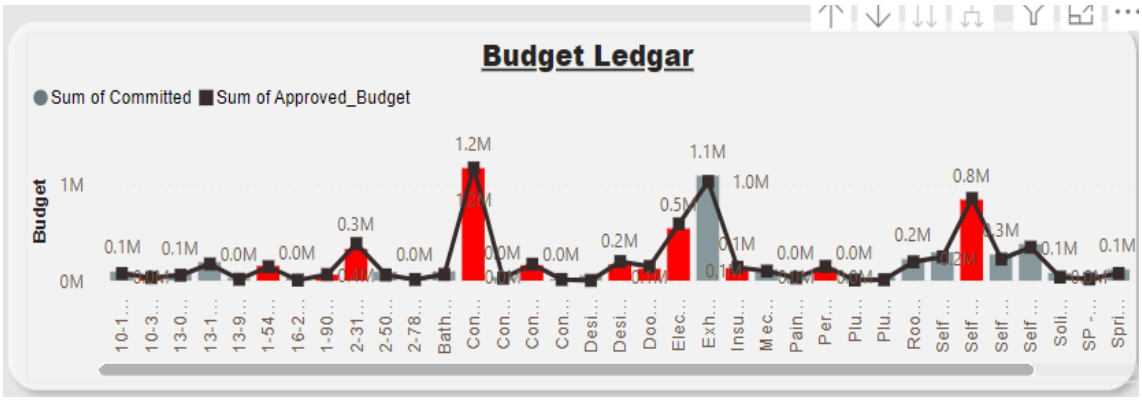
This block gives us details about milestones and their respective completion dates.

Timeline Overview

Project_Code	Milestone	Projected_Date	Target_Date	D
YY21-0008	Start of Testing	July 20, 2022	July 20, 2022	
YY21-0008	Land Tools	May 31, 2022	May 31, 2022	
YY21-0008	Utilities Ready	May 31, 2022	May 31, 2022	
YY21-0008	D90	January 5, 2022	January 5, 2022	
YY21-0008	IFP	January 7, 2022	January 5, 2022	
YY21-0008	D60	December 8, 2021	December 8, 2021	
YY21-0008	Financial Approval	December 22, 2021	December 3, 2021	

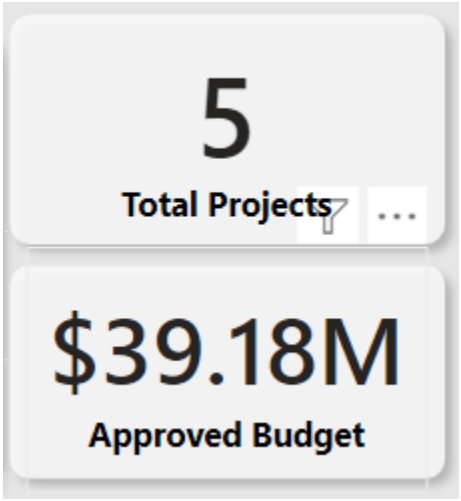
f. Budget Ledger:

This block represents how projects are utilizing allocated budget on project, Division and scope level.



g. Static Blocks:

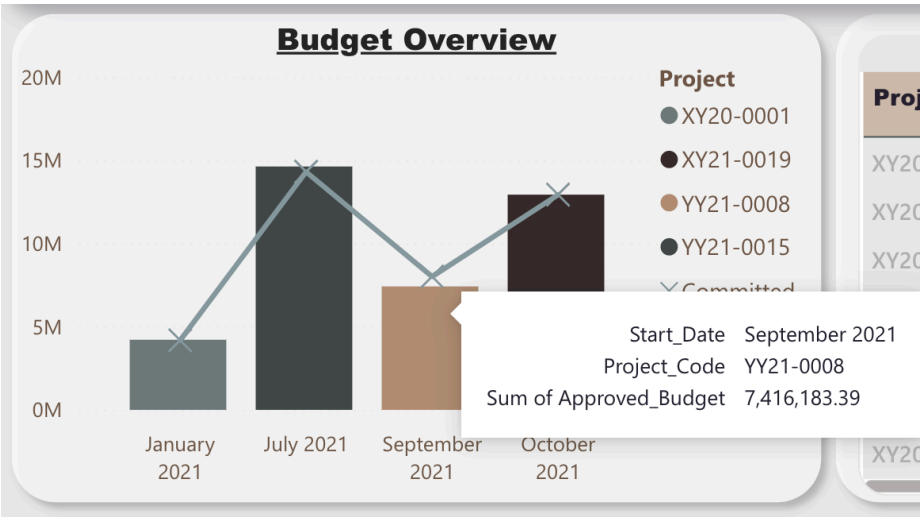
These blocks provides how many projects and how much money allocated for all the projects.



Questionnaire

1. **How would you track number of projects and budget over time?**

   The project details block gives us an idea how budget is allocating for each project over the time and how much committing towards each division and scope. This block is going to add new projects whenever it is there in the data file. This block does not alter based on slicers but remain static to provide project level overview at any point of time.



2. **Report Milestones in a visual to track project progress over time.**

   The Timeline Overview block provides insights on Milestones and their timelines in tabular format with conditional formatting to address following questions.

   a. Milestone dates should be greyed out if the milestone date is in the past

      Changed font color to grey when the Projected_date < current Date. Since all the data is historical, all the records display grey at this moment.

Timeline Overview

Project_Code	Milestone	Projected_Date	Target_Date	D
XY20-0001	Start of Testing	September 30, 2021	September 30, 2021	
XY20-0001	Utilities Ready	September 1, 2021	September 1, 2021	
XY20-0001	Land Tools	August 23, 2021	August 23, 2021	
XY20-0001	IFP	March 29, 2021	March 29, 2021	
XY20-0001	D90	March 11, 2021	March 11, 2021	
XY20-0001	D60	March 1, 2021	March 1, 2021	
XY20-0001	Test Fit	January 31, 2021	January 31, 2021	

   b. Show a flag on the row when the projected date is later than the target date.

      I added a new column in Milestones table to add a red dot if projected_date > target_date. Else blank. Then this column is used in the table to provide User interaction.

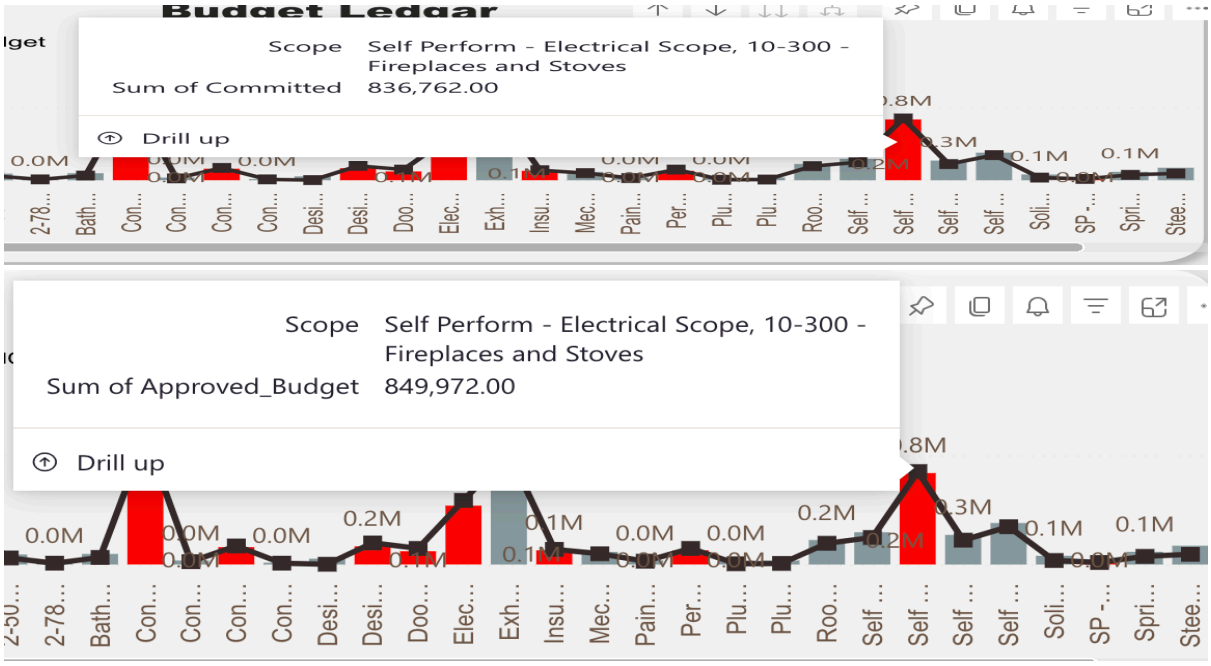
Timeline Overview

le	Milestone	Projected_Date	Target_Date	Delay Flag
	D90	January 5, 2022	January 5, 2022	
	IFP	January 7, 2022	January 5, 2022	
	EQL/Space Plan	December 10, 2021	December 20, 2021	
	D60	December 8, 2021	December 8, 2021	
	Financial Approval	December 22, 2021	December 3, 2021	
	EQL/Space Plan		October 21, 2021	
	Test Fit	November 5, 2021	October 21, 2021	

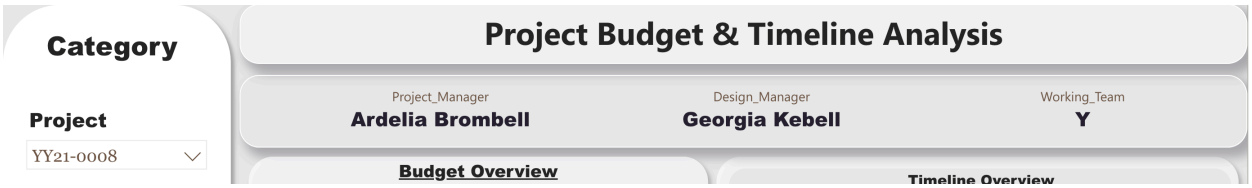
3. **Create a ledger showing budget at different levels of granularity**

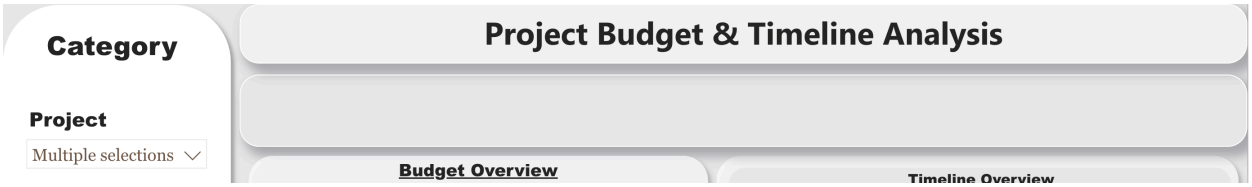
   a. Created a histogram with Project_ID, Scope as X-axis parameters and Committed Budget as Y-axis parameter with Submitted Budget as Legend. These parameters are controlled by Slicers to fine grain data according to user needs.

   b. Used Conditional Formatting to display blocks in red color if Allocated Budet is less than Committed Budget.



4. **Design at least one visual that is only visible when a single project is selected (in a slicer or other visual). If multiple, or all, projects are selected, this visual should be hidden**

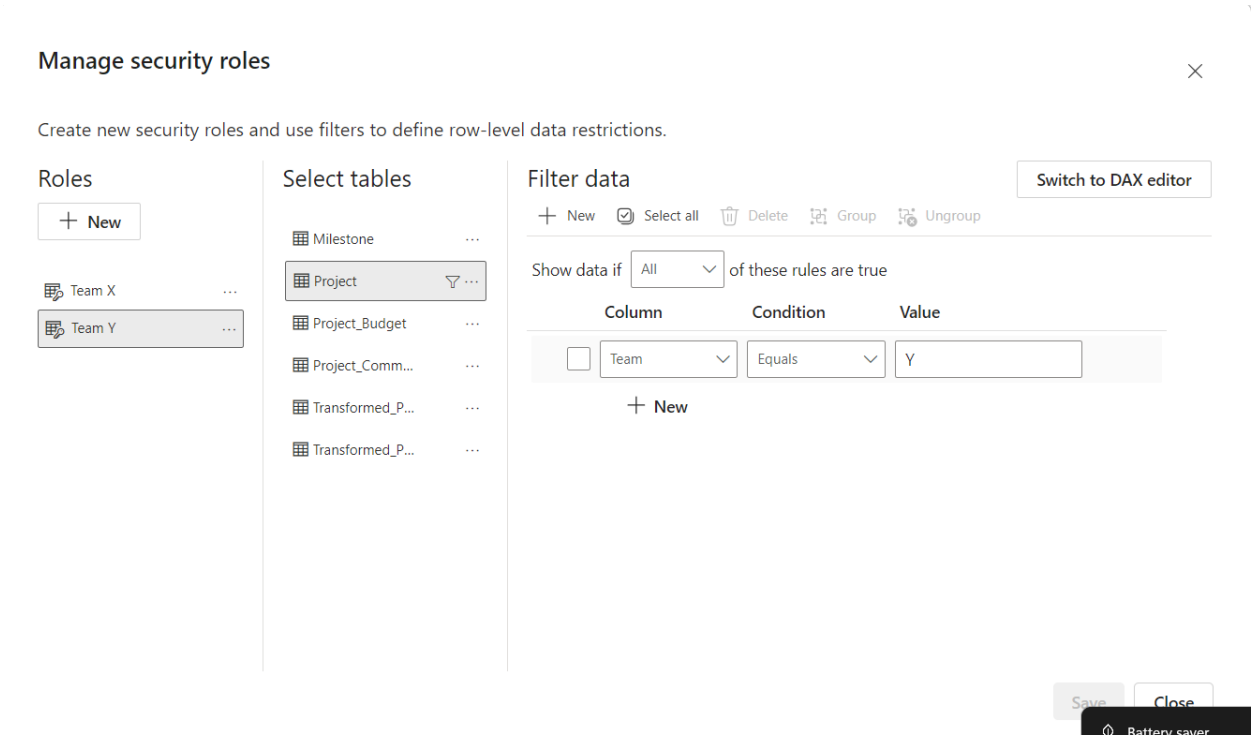




This requirement is achieved in Project Details Block where project details are displayed only if user selected one project. If selected multi projects, the background and text will be of same color giving a visual experience of hiding Data.

5. **How would you implement RLS for end users to only see the data for their team?**

Row level Security can be obtained by creating **Roles** under **Manage Roles** section. I have created two roles and added filter on products table with Team column specific to Team for the role I have created below.



This RLS is implemented in such a way that based on role, the relationship between tables will be applied and filtered based on selection or role condition.

We can organize the Teams by creating groups for each team and adding members to that group will enable RLS and can access only filtered data.

6. **Create a framework to validate the data shared in this excel**

   For Data validation, I used Python and SQL to validate reports data to source file. This script validates data and generates a report in which we can find if there is any difference between Source file and Dashboard KPI.