

**Designing dashboards
in Tableau for Special Events
of relevant project**

submitted by,

Asmita Dey

Class Roll No: 002210503017

Exam Roll: MCA244016

Master of Computer Application

under the supervision of

Prof. (Dr.) Subhadip Basu

in the

Department of Computer Science and Engineering

Faculty of Engineering and Technology

Jadavpur University

2024

Faculty of Engineering and Technology
Jadavpur University

CERTIFICATE OF RECOMMENDATION

To Whom It May Concern

I hereby recommend that the project report entitled “Designing dashboards in Tableau for Special Events of relevant project” has been carried out by Asmita Dey (Reg. No.: 163609 of 2022-23, Roll No.: 002210503017, Exam Roll: MCA244016), under my guidance and supervision and be accepted in partial fulfilment of the requirement for the degree of Master of COMPUTER APPLICATION in DEPARTMENT of COMPUTER SCIENCE and ENGINEERING, JADAVPUR UNIVERSITY during the academic year 2023-2024.

Prof. (Dr.) Subhadip Basu
Project Supervisor
Dept. of Computer Science and
Engineering
Jadavpur University

Prof. (Dr.) Nandini Mukhopadhyay
Head of the Department
Dept. of Computer Science & Engineering
Jadavpur University

Prof. Dipak Laha
Dean, Faculty Council
of Engineering & Technology
Jadavpur University, Kolkata-032

Faculty of Engineering and Technology
Jadavpur University

CERTIFICATE OF APPROVAL

This is to certify that the project report entitled **“Designing dashboards in Tableau for Special Events of relevant project”** is a bonafide record of work carried out by ASMITA DEY, in fulfillment of the requirements for the award of the degree of Master of Computer Application in the Department of Computer Science and Engineering, Jadavpur University. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the project report only for the purpose for which it has been submitted.

Signature of Examiner 1

Date:

Signature of Examiner 2

Date:

Faculty of Engineering and Technology
Jadavpur University

**DECLARATION OF COMPLIANCE WITH
ACADEMIC ETHICS**

I hereby declare that this project report entitled "Designing dashboards in Tableau for Special Events of relevant project" is an outcome of my genuine and independent work, as part of my Master of Computer Application program.

All information in this document has been obtained and presented in accordance with academic rules and ethical conduct.

I also declare that, as required by these rules and conduct, all materials and results that are not original to this work have been fully cited and referenced.

Asmita Dey

Registration No.: 163609 of 2022-23

Examination Roll No.: MCA244016

Thesis Title: Designing dashboards in Tableau for Special Events of relevant project

Signature with Date

ACKNOWLEDGEMENT

With my most sincere and gratitude, I would like to thank **Prof. (Dr.) Subhadip Basu, *Department of Computer Science & Engineering***, my supervisor, for his overwhelming support throughout the duration of the project. His motivation always gave me the required inputs and momentum to continue with my work, without which the project work would not have taken its current shape. His valuable suggestions and numerous discussions have always inspired new ways of thinking. I feel deeply honored that I got this opportunity to work under him.

I would like to express my sincere thanks to all my managers and senior employees of ***CESC Limited RPSG Ventures*** to allow me to work with them in this project.

I would like to thank all the faculty members of the ***Department of Computer Science & Engineering of Jadavpur University*** for their continuous support.

Last, but not the least, I would like to thank my batch mates for staying by my side when I needed them.

Asmita Dey

Class Roll No.: 002210503017

(Exam Roll No.: MCA244016)

ABSTRACT

Tableau is a powerful data visualization tool that allows users to create interactive and dynamic dashboards, reports, and visualizations from various data sources. Its significance in the realm of data analysis lies in its ability to transform raw data into actionable insights through intuitive visualizations, enabling users to uncover patterns, trends, and outliers in their data. It offers a user-friendly interface that empowers both technical and non-technical users to manipulate and visualize data without extensive programming knowledge. With its drag-and-drop functionality, users can easily connect to multiple data sources, including databases, spreadsheets, cloud services, and more, and instantly create visualizations that reveal insights hidden within the data.

One of Tableau's key features is its support for custom SQL queries, which allows users to leverage the full power of SQL to extract and manipulate data from their chosen data sources. This capability is particularly valuable for data analysts who require advanced data manipulation and aggregation techniques to derive meaningful insights from complex datasets. Using custom SQL in Tableau, analysts can perform a wide range of data transformations, including filtering, joining, aggregating, and calculating new metrics, directly within the Tableau interface.

In addition to its data manipulation capabilities, Tableau excels in the creation of visually compelling dashboards and reports. Analysts can use a variety of visualization types, such as bar charts, line graphs, scatter plots, maps, and more, to present their findings in an engaging and digestible format. With interactive features like filters, parameters, and drill-down functionality, users can explore data dynamically and gain deeper insights with just a few clicks.

CONTENTS

1 Introduction	7
1.1 Overview to the Project	7
1.2 Need for Tableau in the Project:	9
1.3 Introduction to PL/SQL:	11
2 Methodology	14
2.1 Designing of worksheets with custom SQL:	14
2.2 Designing of dashboards with worksheets:	17
3 Results and Discussion:	21
3.1 CM Status Report Dashboard:	21
3.2 SM Status Report Dashboard:	25
3.3 Hotspots Details Dashboard:	29
4 Conclusion	33
5 References	35

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW TO THE PROJECT:

Asset Management System

Requirement of an Asset Management software :

- Unstructured and non uniform practices followed in maintaining records of Assets.
- Planned maintenance was not possible.

Features and Functionalities of Asset Management System

- Integrated Asset Register of major electrical plant and equipment in use.
- Maintenance Management functionalities
 - Preventive Maintenance (PM)
 - Status Monitoring (SM)
 - Condition Maintenance (CM)
 - Repair/Breakdown Maintenance (BM)
 - Abnormal Observation (AO)

Asset Categories in Asset Management System

Power Transformer

- **Distribution Transformer**
- **33/0.4 kV Earthing Transformer**
- **33/0.4 kV Auxiliary Transformer**

And many more..

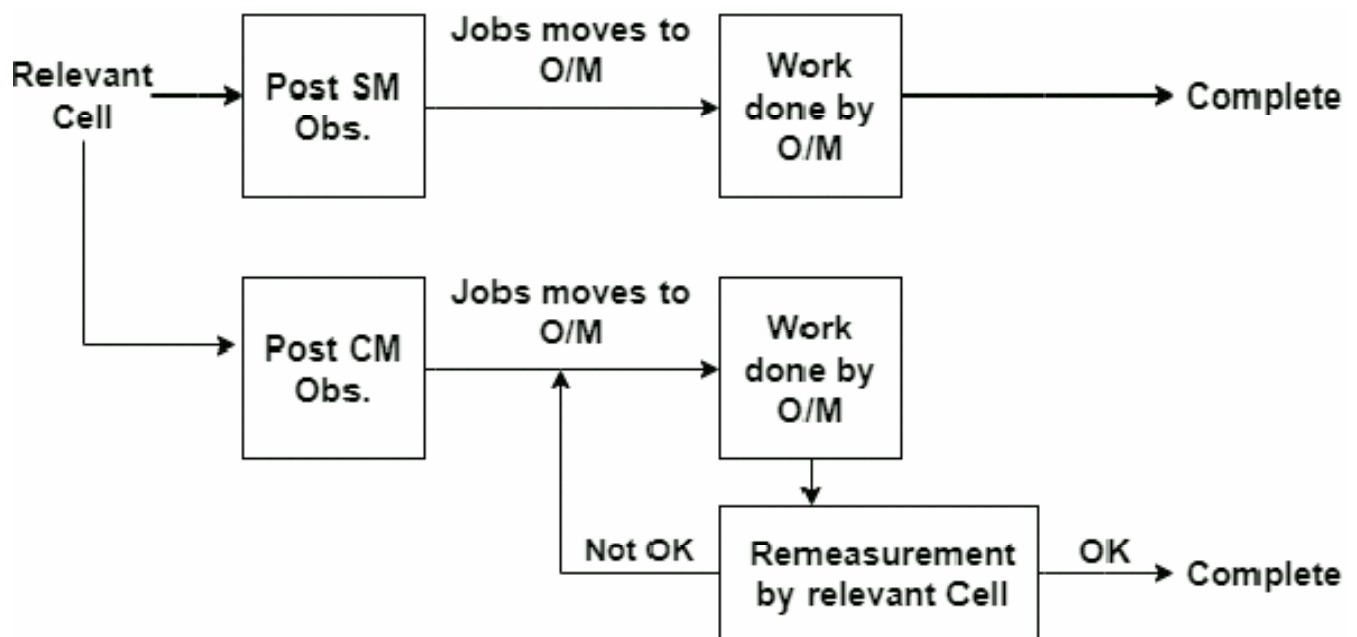
Maintenance functions

- **Status Monitoring (SM)**
 - Monitoring of assets through visual inspection.
 - Urgent/Important observations posted in the system.
- **Condition Monitoring (CM)**
 - Monitoring of assets by measurements through Intrusive & Non-Intrusive activities.
 - Non-Intrusive CM Re-measurement done again
- **Preventive Maintenance (PM)**

The Preventive Maintenance (PM) done by O&M departments as per the PM Regime.

Maintenance Regime

The SM/CM/PM Regime for different categories of assets are stored in the system.



1.2 NEED FOR TABLEAU IN THE PROJECT:

Tableau holds significant importance in crafting dashboards for projects due to its robust features, intuitive interface, and powerful data visualization capabilities. Let us delve into why Tableau is instrumental in creating effective dashboards for the relevant project.

- **Data Integration and Connectivity:** Tableau can seamlessly connect to various data sources, including databases, spreadsheets, cloud services, and more. For this project, which likely involves multiple data streams from diverse sources, Tableau's ability to integrate and consolidate data is invaluable. Whether it is customer data, sales figures, or market trends, Tableau can pull in the necessary information to provide a comprehensive view.
- **Visual Analytics:** Tableau excels in visualizing data in a meaningful and insightful manner. Its wide array of visualization options, including bar charts, line graphs, scatter plots, and geographical maps, allows for the representation of different types of data. In the context of this project, stakeholders can gain actionable insights by visually exploring trends, patterns, and relationships within the data through Tableau's interactive dashboards.
- **Dashboard Design Flexibility:** Tableau offers flexibility in dashboard design, enabling users to customize layouts, colours, fonts, and other design elements to align with the project's branding and requirements. Dashboards can be tailored to cater to different stakeholders, each with their specific information needs. Whether it is executives, project managers,

or analysts, Tableau dashboards can be designed to deliver the right information in a digestible format.

- **Interactivity and Drill-Down Capabilities:** Interactivity is key to engaging stakeholders and facilitating data exploration. Tableau allows users to interact with dashboards dynamically, enabling drill-downs, filtering, and parameter controls. This feature is particularly useful for this project, where stakeholders may want to delve deeper into specific data subsets or analyse data from different perspectives.
- **Real-Time Data Updates:** In dynamic projects like this one, where data is constantly evolving, having access to real-time or near-real-time data is crucial. Tableau can connect to live data sources, ensuring that dashboards reflect the most up-to-date information. Whether it is monitoring campaign performance, tracking inventory levels, or analysing customer feedback, Tableau dashboards can provide timely insights to inform decision-making.
- **Collaboration and Sharing:** Tableau facilitates collaboration by allowing users to share dashboards securely within the organization or with external stakeholders. Whether it is sharing via Tableau Server, Tableau Online, or embedding dashboards in web pages or presentations, Tableau makes it easy to disseminate insights across teams and departments. This collaborative aspect is essential for the project, where cross-functional teams may need to collaborate and align their efforts.
- **Scalability and Performance:** Tableau is designed to handle large volumes of data and complex analyses efficiently. Whether dealing with millions of rows of data or performing

sophisticated calculations, Tableau's in-memory processing and optimization capabilities ensure optimal performance. This scalability is crucial for projects like this one, which may involve extensive data analysis and reporting across various dimensions.

1.3 INTRODUCTION TO PL/SQL:

PL/SQL (Procedural Language/Structured Query Language) is a powerful extension of SQL (Structured Query Language) used for procedural programming in Oracle databases. It allows developers to write procedural logic directly within the database, enabling tasks such as data manipulation, transaction control, and business logic implementation to be performed efficiently. Let us delve into the functionality and features of PL/SQL:

- **Procedural Constructs:** PL/SQL provides procedural constructs like loops, conditional statements, and exception handling, allowing developers to write complex logic within database programs. This procedural approach enhances the capabilities of SQL by enabling the creation of more sophisticated applications.
- **Data Manipulation:** PL/SQL supports data manipulation operations such as INSERT, UPDATE, DELETE, and SELECT statements. Developers can use PL/SQL to write scripts that manipulate data stored in tables, perform calculations, and generate derived data sets.

- **Transaction Management:** PL/SQL enables developers to manage transactions effectively. Transactions ensure the integrity of data by allowing multiple SQL statements to be treated as a single unit of work that either succeeds or fails as a whole. PL/SQL provides commands like COMMIT, ROLLBACK, and SAVEPOINT to control transaction behavior and maintain data consistency.
- **Business Logic Implementation:** One of the key functionalities of PL/SQL is the ability to implement business logic directly within the database. Developers can encapsulate complex business rules and calculations into PL/SQL procedures, functions, and triggers. This ensures that business logic is centralized, enforced consistently, and executed efficiently, irrespective of the client application accessing the database.
- **Modularity and Reusability:** PL/SQL supports modularity and code reusability through the use of procedures, functions, and packages. Procedures and functions encapsulate specific units of logic, promoting code organization and maintainability. Packages group related procedures, functions, and variables together, providing a modular and reusable framework for database programming.
- **Exception Handling:** PL/SQL includes robust exception handling mechanisms to manage errors and exceptions that may occur during program execution. Developers can define exception handlers to gracefully handle errors, log diagnostic information, and perform recovery actions as needed. This ensures that database applications maintain reliability and integrity even in the face of unexpected errors.

- **Integration with SQL:** PL/SQL seamlessly integrates with SQL, allowing developers to embed SQL statements directly within PL/SQL code. This tight integration enables developers to leverage the power of SQL for data retrieval and manipulation while benefiting from the procedural capabilities of PL/SQL for implementing complex logic.
- **Performance Optimization:** PL/SQL offers performance optimization features such as bulk processing, cursor management, and optimized SQL execution. By leveraging these features, developers can improve the efficiency and performance of database applications, particularly when dealing with large volumes of data or complex processing requirements.

In summary, PL/SQL extends the capabilities of SQL by providing procedural programming constructs, transaction management, business logic implementation, modularity, and performance optimization features. Its seamless integration with SQL and robust exception handling capabilities makes it a versatile and indispensable tool for developing high-performance, scalable, and maintainable database applications in Oracle environments.

CHAPTER 2

METHODOLOGY

2.1 DESIGNING OF WORKSHEETS WITH CUSTOM SQL:

Tableau Setup:

Setting up Tableau with a server involves several steps to ensure seamless integration and data accessibility. Any servers hosting your data, provides the foundation for Tableau to connect, extract, and visualize data. Below is a detailed guide on how to set up Tableau with a server:

- **System Requirements Check:** Before installing Tableau, ensure that your system meets the minimum requirements specified by Tableau. This includes considerations for operating system compatibility, processor speed, RAM, and disk space.
- **Install Tableau Desktop:** If you haven't already, download and install Tableau Desktop on your local machine. Tableau offers a free trial version for evaluation purposes. During installation, follow the prompts to set up Tableau Desktop with the appropriate configurations for your operating system.
- **Connect to the Server:** Launch Tableau Desktop and navigate to the "Connect" pane. Here, you'll find various data connection options. Choose the appropriate connection type for your server. This could be a direct connection using ODBC, JDBC, or a native connector if Tableau supports integration with the server out of the box.

- **Configure Data Source Connection:** Once you've selected the connection type, you'll need to provide the necessary connection details such as server address, port number, authentication credentials, and database name. Test the connection to ensure that Tableau can successfully connect to the server.
- **Import Data into Tableau:** After establishing a connection to the server, you can import data into Tableau by selecting the relevant tables or views from the database schema. Tableau provides a visual interface for browsing and selecting data sources, making it easy to choose the datasets you want to work with.

Steps to Create Worksheets Using Custom SQL:

- **Connect to Data Source:** Launch Tableau Desktop and connect to your data source using the appropriate connection type (e.g., ODBC, JDBC). Choose the option to connect using custom SQL.
- **Write Custom SQL Query:** In the "Connect" pane, select the option to connect using custom SQL. This will open a query editor where you can write your SQL query. Craft your SQL query to retrieve the data you need for your analysis, including any necessary joins, filters, or calculations.
- **Preview and Validate Query:** After writing your custom SQL query, preview the results to ensure that the data returned is accurate and meets your requirements. Validate the query for syntax errors or logical issues before proceeding.
- **Import Data into Tableau:** Once you're satisfied with the custom SQL query, import the data into Tableau by clicking on the

"Connect" button. Tableau will execute the SQL query and import the resulting dataset into the Tableau data source.

- **Create Worksheets:** With the data imported into Tableau, navigate to the "Data" pane to view the fields available in your dataset. Drag and drop fields onto the rows and columns shelves to create a basic worksheet. Choose appropriate visualization types (e.g., bar chart, line graph, scatter plot) based on your data and analysis goals.
- **Add Features and Modifications:** To enhance your worksheets and make them more insightful, consider implementing the following features and modifications:
 - **Filters:** Apply filters to focus on specific subsets of data. You can add filters based on dimensions or measures to include or exclude certain data points.
 - **Parameters:** Create parameters to allow users to dynamically change aspects of the visualization, such as date ranges, thresholds, or categories.
 - **Calculations:** Use calculated fields to perform additional calculations or transformations on your data. This could include aggregations, comparisons, or custom logic based on your analysis requirements.
 - **Formatting:** Customize the appearance of your visualizations by adjusting formatting options such as colors, fonts, labels, and axes. Ensure that your visualizations are easy to interpret and visually appealing.

- **Annotations:** Add annotations to highlight important insights or trends in your data. Annotations can include text, shapes, lines, or arrows to provide context and explanation.
- **Interactivity:** Enable interactivity features such as tooltips, highlighting, and drill-downs to allow users to explore the data further and gain deeper insights.
- **Test and Iterate:** After adding features and modifications to your worksheets, thoroughly test them to ensure accuracy and usability. Iterate on your design based on feedback and insights gained from the analysis process.
- **Publish and Share:** Once your worksheets are finalized, publish them to Tableau Server or Tableau Online to share them with stakeholders within your organization. Ensure that appropriate permissions and access controls are set up to manage who can view and interact with the worksheets.

2.2 DESIGNING OF DASHBOARDS WITH WORKSHEETS:

Dashboard Creation:

- **Navigate to Dashboard Pane:** Once your worksheets are created, navigate to the dashboard pane by clicking on the "Dashboard" tab at the bottom of the Tableau interface.
- **Create a New Dashboard:** Click on the "New Dashboard" icon to create a blank dashboard canvas where you'll arrange your worksheets and other dashboard components.

- **Add Worksheets to Dashboard:** Drag individual worksheets from the Objects pane (located on the left side of the Tableau interface) onto the dashboard canvas. Arrange the worksheets spatially to create a visually appealing layout.
- **Adjust Size and Position:** Resize and reposition each worksheet on the dashboard canvas to optimize space and ensure a clear presentation. You can adjust the size of worksheets by clicking and dragging the edges, and you can align them using the alignment tools available in the dashboard layout menu.
- **Add Dashboard Titles and Text Boxes:** Include titles, subtitles, and explanatory text boxes to provide context and guidance to dashboard users. Use the text tool to add text boxes and customize the font, size, and color to match your dashboard's theme.

Interactivity and Navigation:

- **Apply Dashboard Actions:** Enhance interactivity by adding dashboard actions such as filter actions, highlight actions, URL actions, and parameter actions. These actions allow users to interact with one worksheet and dynamically update other related worksheets on the dashboard.
- **Configure Dashboard Filters:** Add interactive filters to the dashboard to enable users to drill down into specific segments of data. Use filter actions to synchronize filters across multiple worksheets and maintain consistency in data exploration.
- **Implement Drill-Down Functionality:** Implement drill-down functionality by creating hierarchical structures within your

worksheets. This allows users to navigate from high-level summaries to detailed insights by clicking on specific data points.

Formatting and Design:

- **Apply Formatting Styles:** Ensure consistency in formatting by applying consistent color schemes, fonts, and styles across all worksheets and dashboard components. Use Tableau's formatting options to customize the appearance of headers, legends, axes, and labels.
- **Optimize Layout for Readability:** Optimize the layout of your dashboard for readability and usability. Minimize clutter by arranging elements logically and providing ample whitespace between components. Consider the flow of information and guide users' attention towards key insights.
- **Test and Iterate:** Thoroughly test the functionality and usability of your dashboard by interacting with it as an end-user would. Solicit feedback from stakeholders and iterate on your design based on their input and observations.

Publish and Share:

- **Publish to Tableau Server or Tableau Online:** Once your dashboard is finalized, publish it to Tableau Server or Tableau Online to share it with stakeholders within your organization. Ensure that appropriate permissions and access controls are set up to manage who can view and interact with the dashboard.
- **Share Dashboard URL or Embed in Web Pages:** Share the dashboard URL or embed it in web pages, intranet portals, or other

CHAPTER 2. METHODOLOGY

communication channels to make it easily accessible to a wider audience. Monitor usage and gather feedback to continuously improve the dashboard over time.

CHAPTER 3

RESULTS AND DISCUSSION

Overview to Special Events:

Under the Project, there are some special events like Durga puja etc all around Calcutta that needs extra guidance or lookup than all other events occurring. There are some asset categories such as **DTR, PSS, RMU, CM** and **SWITCHGEAR** and some of these assets are associated with the special events.

In the special events dashboard, the count of special events under each of the asset categories is noted. The condition monitoring, status monitoring, and the DTR hotspots details have been noted for special events asset type wise as well as district wise.

3.1 CM STATUS REPORT DASHBOARD:

Step 1: Create the "Asset Inspected" Worksheet

- Begin by creating a worksheet titled "Asset Inspected" in Tableau.
- Utilize custom SQL to query your database for asset inspection data.
- Format the data as needed for visualization.

CHAPTER 3. RESULTS AND DISCUSSION

Step 2: Create "CM Status Report - Asset Typewise" Worksheet

- Create another worksheet titled "CM Status Report - Asset Typewise."
- Again, use custom SQL to query your database for data related to condition monitoring (CM) status, grouped by asset type.
- Apply necessary formatting to the data for clarity and visual appeal.

Step 3: Create "CM Status Report - District Wise" Worksheet

- Next, create the "CM Status Report - District Wise" worksheet.
- Use custom SQL to query your database for CM status data, this time grouping it by district.
- Format the data appropriately for visualization.

Step 4: Incorporate Date Range Parameters

- Add date range parameters to each worksheet to allow users to specify the time frame for data analysis.
- Ensure that these parameters are dynamic and can be adjusted by the dashboard viewer.

Step 5: Gather Worksheets to Form Dashboard

- Once all individual worksheets are created and formatted, gather them to form the dashboard.
- Arrange the worksheets on the dashboard canvas in a logical and visually appealing manner.
- Leave space for additional elements such as titles, filters, and legends.

Step 6: Apply Necessary Formatting or Modifications

CHAPTER 3. RESULTS AND DISCUSSION

- Review the dashboard layout and apply any necessary formatting adjustments to ensure consistency and clarity.
- Add titles, axis labels, and legends where appropriate to guide users in interpreting the data.

Step 7: Create Links to Other Dashboards

- If applicable, create links within the dashboard to navigate to other related dashboards or reports.
- Utilize dashboard actions or hyperlinks to enable seamless navigation between different analytical views.

ASSETS INSPECTED	
ASSET CATEGORY	COUNT
DTR	9
PSS	0
RMU	11
CM	2
SWITCHGEAR	0

*Fig1: Asset Inspected Worksheet**

CM STATUS REPORT ASSET TYPEWISE									
ASSET CATEGORY	PD DETECTED ≥ 10DB	PD DETECTED < 10DB	PD ATTENDED ≥ 10DB	PD ATTENDED < 10DB	PD PENDING ≥ 10DB	PD PENDING < 10DB	HOTSPOTS DETECTED	HOTSPOTS ATTENDED	HOTSPOTS PENDING
DTR	10	0	8	0	2	0	35	23	12
PSS	0	0	0	0	0	0	0	0	0
RMU	0	0	0	0	0	0	0	0	0
CM	0	0	0	0	0	0	0	0	0
SWITCHGEAR	0	0	0	0	0	0	0	0	0

*Fig2: CM Status Report Asset Typewise Worksheet**

CHAPTER 3. RESULTS AND DISCUSSION

CM STATUS REPORT DISTRICT WISE									
DISTRICTS	PD DETECTED $\geq$ 10DB	PD DETECTED $<$ 10DB	PD ATTENDED $\geq$ 10DB	PD ATTENDED $<$ 10DB	PD PENDING $\geq$ 10DB	PD PENDING $<$ 10DB	HOTSPOTS DETECTED	HOTSPOTS ATTENDED	HOTSPOTS PENDING
CCD	10	0	8	0	2	0	35	23	12
CND	0	0	0	0	0	0	0	0	0
CSD	0	0	0	0	0	0	0	0	0
HD	0	0	0	0	0	0	0	0	0
ND	0	0	0	0	0	0	0	0	0
NSD	0	0	0	0	0	0	0	0	0
SD	0	0	0	0	0	0	0	0	0
SERD	0	0	0	0	0	0	0	0	0
SWD	0	0	0	0	0	0	0	0	0
WSD	0	0	0	0	0	0	0	0	0

Fig3: CM Status Report District wise Worksheet*



SPECIAL EVENT DASHBOARD



Date Range:
to

[Click here for SM Report](#)
[Click here for HS Details](#)

ASSETS INSPECTED

ASSET CATEGORY	COUNT
DTR	9
PSS	0
RMU	11
CM	2
SWITCHGEAR	0

CM STATUS REPORT ASSET TYPEWISE

ASSET CATEGORY	PD DETECTED >= 10DB	PD DETECTED < 10DB	PD ATTENDED >= 10DB	PD ATTENDED < 10DB	PD PENDING >= 10DB	PD PENDING < 10DB	HOTSPOTS DETECTED	HOTSPOTS ATTENDED	HOTSPOTS PENDING
DTR	10	0	8	0	2	0	35	23	12
PSS	0	0	0	0	0	0	0	0	0
RMU	0	0	0	0	0	0	0	0	0
CM	0	0	0	0	0	0	0	0	0
SWITCHGEAR	0	0	0	0	0	0	0	0	0

CM STATUS REPORT DISTRICT WISE

DISTRICTS	PD DETECTED >= 10DB	PD DETECTED < 10DB	PD ATTENDED >= 10DB	PD ATTENDED < 10DB	PD PENDING >= 10DB	PD PENDING < 10DB	HOTSPOTS DETECTED	HOTSPOTS ATTENDED	HOTSPOTS PENDING
CCD	10	0	8	0	2	0	35	23	12
CND	0	0	0	0	0	0	0	0	0
CSD	0	0	0	0	0	0	0	0	0
HD	0	0	0	0	0	0	0	0	0
ND	0	0	0	0	0	0	0	0	0
NSD	0	0	0	0	0	0	0	0	0
SD	0	0	0	0	0	0	0	0	0
SERD	0	0	0	0	0	0	0	0	0
SWD	0	0	0	0	0	0	0	0	0
WSD	0	0	0	0	0	0	0	0	0

Fig4: CM Status Report Dashboard*

*Image Courtesy: CESC Limited RPSG Ventures

3.2 SM STATUS REPORT DASHBOARD:

Step 1: Create the "Asset Inspected" Worksheet

- Begin by creating a worksheet titled "Asset Inspected" in Tableau.
- Utilize custom SQL to query your database for asset inspection data.
- Format the data as needed for visualization.

Step 2: Create "SM Status Report - Asset Typewise" Worksheet

- Create another worksheet titled "SM Status Report - Asset Typewise."
- Again, use custom SQL to query your database for data related to status monitoring (SM) status, grouped by asset type.
- Apply necessary formatting to the data for clarity and visual appeal.

Step 3: Create "SM Status Report - District Wise" Worksheet

- Next, create the "SM Status Report - District Wise" worksheet.
- Use custom SQL to query your database for SM status data, this time grouping it by district.
- Format the data appropriately for visualization.

Step 4: Incorporate Date Range Parameters

- Add date range parameters to each worksheet to allow users to specify the time frame for data analysis.
- Ensure that these parameters are dynamic and can be adjusted by the dashboard viewer.

Step 5: Gather Worksheets to Form Dashboard

CHAPTER 3. RESULTS AND DISCUSSION

- Once all individual worksheets are created and formatted, gather them to form the dashboard.
- Arrange the worksheets on the dashboard canvas in a logical and visually appealing manner.
- Leave space for additional elements such as titles, filters, and legends.

Step 6: Apply Necessary Formatting or Modifications

- Review the dashboard layout and apply any necessary formatting adjustments to ensure consistency and clarity.
- Add titles, axis labels, and legends where appropriate to guide users in interpreting the data.

Step 7: Create Links to Other Dashboards

- If applicable, create links within the dashboard to navigate to other related dashboards or reports.
- Utilize dashboard actions or hyperlinks to enable seamless navigation between different analytical views.

ASSETS INSPECTED	
ASSET CATEGORY	COUNT
DTR	9
PSS	0
RMU	11
CM	2
SWITCHGEAR	0

*Fig1: Asset Inspected Worksheet**

CHAPTER 3. RESULTS AND DISCUSSION

SM STATUS REPORT ASSET TYPEWISE												
ASSET CATEGORY	SM URGENT DETECTED(ASSET COUNT)	SM URGENT ATTENDED(ASSET COUNT)	SM URGENT PENDING(ASSET COUNT)	SM URGENT DETECTED(OBS. COUNT)	SM URGENT ATTENDED(OBS. COUNT)	SM URGENT PENDING(OBS. COUNT)	SM IMP DETECTED(ASSET COUNT)	SM IMP ATTENDED(ASSET COUNT)	SM IMP PENDING(ASSET COUNT)	SM IMP DETECTED(OBS. COUNT)	SM IMP ATTENDED(OBS. COUNT)	SM IMP PENDING(OBS. COUNT)
DTR	5	3	2	20	12	8	10	8	2	22	15	7
PSS	0	0	0	0	0	0	0	0	0	0	0	0
RMU	0	0	0	0	0	0	0	0	0	0	0	0
CM	0	0	0	0	0	0	0	0	0	0	0	0
SWITCHGEAR	0	0	0	0	0	0	0	0	0	0	0	0

*Fig5: SM Status Report Asset Typewise Worksheet**

SM STATUS REPORT DISTRICT WISE												
DISTRICTS	SM URGENT DETECTED(ASSET COUNT)	SM URGENT ATTENDED(ASSET COUNT)	SM URGENT PENDING(ASSET COUNT)	SM URGENT DETECTED(OBS. COUNT)	SM URGENT ATTENDED(OBS. COUNT)	SM URGENT PENDING(OBS. COUNT)	SM IMP DETECTED(ASSET COUNT)	SM IMP ATTENDED(ASSET COUNT)	SM IMP PENDING(ASSET COUNT)	SM IMP DETECTED(OBS. COUNT)	SM IMP ATTENDED(OBS. COUNT)	SM IMP PENDING(OBS. COUNT)
CCD	5	3	2	20	12	8	0	0	0	0	0	0
CND	0	0	0	0	0	0	10	8	2	22	15	7
CSD	0	0	0	0	0	0	0	0	0	0	0	0
HD	0	0	0	0	0	0	0	0	0	0	0	0
ND	0	0	0	0	0	0	0	0	0	0	0	0
NSD	0	0	0	0	0	0	0	0	0	0	0	0
SD	0	0	0	0	0	0	0	0	0	0	0	0
SERD	0	0	0	0	0	0	0	0	0	0	0	0
SWD	0	0	0	0	0	0	0	0	0	0	0	0
WSD	0	0	0	0	0	0	0	0	0	0	0	0

*Fig6: SM Status Report District wise Worksheet**

CHAPTER 3. RESULTS AND DISCUSSION

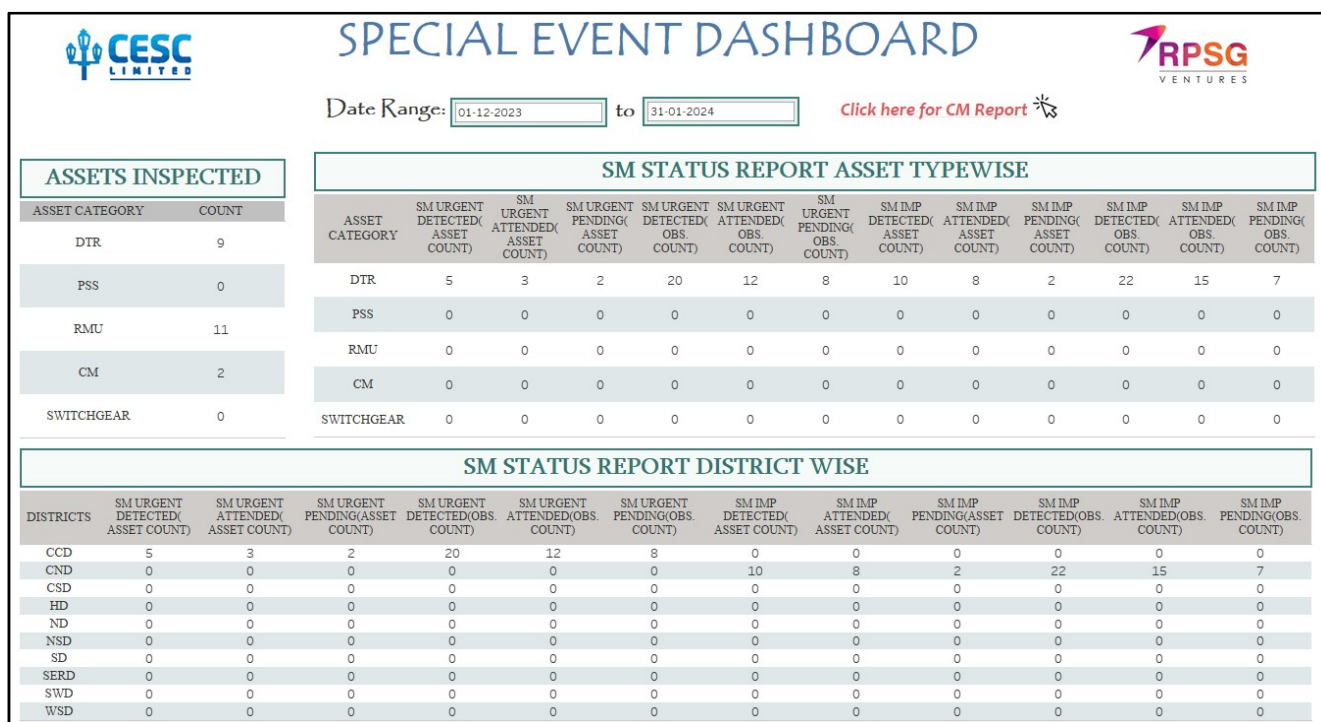


Fig7: SM Status Report Dashboard*

*Image Courtesy: CESC Limited RPSG Ventures

3.3 HOTSPOTS DETAILS DASHBOARD:

Step 1: Create the "DTR HS $\geq$ 150 Deg C HOTSPOTS" Worksheet

- Begin by creating a worksheet titled "DTR HS $\geq$ 150 Deg C HOTSPOTS" in Tableau.
- Use custom SQL to query your database for data related to hotspots in DTRs where the temperature is greater than or equal to 150 degrees Celsius.
- Format the data as needed for visualization

Step 2: Create the "DTR HS $<$ 150 Deg C HOTSPOTS" Worksheet

- Create another worksheet titled "DTR HS $<$ 150 Deg C HOTSPOTS."
- Use custom SQL to query your database for data related to hotspots in DTRs where the temperature is less than 150 degrees Celsius.
- Apply formatting and visualization techniques to represent this data appropriately.

Step 3: Create the "DTR Cooling Ckt. Choked/High Body Temperature Cases" Worksheet

- Next, create the "DTR Cooling Ckt. Choked/High Body Temperature Cases" worksheet.
- Utilize custom SQL to query your database for cases related to cooling circuit choke or high body temperature in DTRs.
- Format the data for visualization.

Step 4: Incorporate Date Range Parameters

- Add date range parameters to each worksheet to allow users to specify the time frame for data analysis.

CHAPTER 3. RESULTS AND DISCUSSION

- Ensure that these parameters are dynamic and can be adjusted by the dashboard viewer.

Step 5: Gather Worksheets to Form Dashboard

- Once all individual worksheets are created and formatted, gather them to form the dashboard.
- Arrange the worksheets on the dashboard canvas in a logical and visually appealing manner, considering the flow of information and user experience.
- Leave space for additional elements such as titles, filters, and legends.

Step 6: Apply Necessary Formatting or Modifications

- Review the dashboard layout and apply any necessary formatting adjustments to ensure consistency and clarity.
- Add titles, axis labels, and legends where appropriate to guide users in interpreting the data.
- Ensure that the color scheme and styling are consistent across all worksheets to maintain visual coherence.

Step 7: Create Links to Other Dashboards

- If relevant, create links within the dashboard to navigate to other related dashboards or reports.
- Utilize dashboard actions or hyperlinks to enable seamless navigation between different analytical views, enhancing the overall user experience.

CHAPTER 3. RESULTS AND DISCUSSION

DTR HS $\geq$ 150 Deg C HOTSPOTS						
DISTRICTS	HOTSPOTS DETECTED(ASSET COUNT)	HOTSPOTS ATTENDED(ASSET COUNT)	HOTSPOTS PENDING(ASSET COUNT)	HOTSPOTS DETECTED(OBS. COUNT)	HOTSPOTS ATTENDED(OBS. COUNT)	HOTSPOTS PENDING(OBS. COUNT)
CCD	12	6	6	22	18	4
CND	0	0	0	0	0	0
CSD	0	0	0	0	0	0
HD	0	0	0	0	0	0
ND	0	0	0	0	0	0
NSD	0	0	0	0	0	0
SD	0	0	0	0	0	0
SERD	0	0	0	0	0	0
SWD	0	0	0	0	0	0
WSD	0	0	0	0	0	0

Fig8: DTR HS $\geq$ 150 Deg C Hotspots Worksheet*

DTR HS<150 Deg C HOTSPOTS						
DISTRICTS	HOTSPOTS DETECTED(ASSET COUNT)	HOTSPOTS ATTENDED(ASSET COUNT)	HOTSPOTS PENDING(ASSET COUNT)	HOTSPOTS DETECTED(OBS. COUNT)	HOTSPOTS ATTENDED(OBS. COUNT)	HOTSPOTS PENDING(OBS. COUNT)
CCD	26	15	10	46	36	10
CND	0	0	0	0	0	0
CSD	0	0	0	0	0	0
HD	0	0	0	0	0	0
ND	0	0	0	0	0	0
NSD	0	0	0	0	0	0
SD	0	0	0	0	0	0
SERD	0	0	0	0	0	0
SWD	0	0	0	0	0	0
WSD	0	0	0	0	0	0

Fig9: DTR HS<150 Deg C Hotspots Worksheet*

CHAPTER 3. RESULTS AND DISCUSSION

DTR COOLING CKT. CHOKED/HIGH BODY TEMPERATURE CASES			
DISTRICTS	CASES DETECTED	CASES ATTENDED	CASES PENDING
CCD	12	7	5
CND	0	0	0
CSD	0	0	0
HD	0	0	0
ND	0	0	0
NSD	0	0	0
SD	0	0	0
SERD	0	0	0
SWD	0	0	0
WSD	0	0	0

Fig10: DTR Cooling Ckt. Choked/High Body Temperature Cases Worksheet*



SPECIAL EVENT DASHBOARD



Date Range:

01-12-2023

to

31-01-2024

Click here for CM Report

DTR HS>=150 Deg C HOTSPOTS

DISTRICTS	HOTSPOTS DETECTED(ASSET COUNT)	HOTSPOTS ATTENDED(ASSET COUNT)	HOTSPOTS PENDING(ASSET COUNT)	HOTSPOTS DETECTED(OBS. COUNT)	HOTSPOTS ATTENDED(OBS. COUNT)	HOTSPOTS PENDING(OBS. COUNT)
CCD	12	6	6	22	18	4
CND	0	0	0	0	0	0
CSD	0	0	0	0	0	0
HD	0	0	0	0	0	0
ND	0	0	0	0	0	0
NSD	0	0	0	0	0	0
SD	0	0	0	0	0	0
SERD	0	0	0	0	0	0
SWD	0	0	0	0	0	0
WSD	0	0	0	0	0	0

DTR HS<150 Deg C HOTSPOTS

DISTRICTS	HOTSPOTS DETECTED(ASSET COUNT)	HOTSPOTS ATTENDED(ASSET COUNT)	HOTSPOTS PENDING(ASSET COUNT)	HOTSPOTS DETECTED(OBS. COUNT)	HOTSPOTS ATTENDED(OBS. COUNT)	HOTSPOTS PENDING(OBS. COUNT)
CCD	26	15	10	46	36	10
CND	0	0	0	0	0	0
CSD	0	0	0	0	0	0
HD	0	0	0	0	0	0
ND	0	0	0	0	0	0
NSD	0	0	0	0	0	0
SD	0	0	0	0	0	0
SERD	0	0	0	0	0	0
SWD	0	0	0	0	0	0
WSD	0	0	0	0	0	0

DTR COOLING CKT. CHOKED/HIGH BODY TEMPERATURE CASES

DISTRICTS	CASES DETECTED	CASES ATTENDED	CASES PENDING
CCD	12	7	5
CND	0	0	0
CSD	0	0	0
HD	0	0	0
ND	0	0	0
NSD	0	0	0
SD	0	0	0
SERD	0	0	0
SWD	0	0	0
WSD	0	0	0

Fig11: Hotspots Details Dashboard*

*Image Courtesy: CESC Limited RPSG Ventures

CHAPTER 4

CONCLUSION

The culmination of the project marks a significant achievement in harnessing data analytics and visualization techniques to gain valuable insights into the performance and maintenance requirements of assets within the electrical distribution network. Through a meticulous and stepwise approach, the project has successfully achieved its objectives and delivered tangible outcomes for stakeholders involved. Let us elaborate on the conclusion of each step and tie them together:

- **Data Collection and Integration:** The initial phase of the project involved collecting data from various sources, including asset inspection records, condition monitoring (CM) status reports, and other relevant datasets. By consolidating these disparate data sources, the project laid a solid foundation for comprehensive analysis and decision-making.
- **Custom SQL Queries and Worksheet Creation:** Custom SQL queries were instrumental in extracting and transforming raw data into actionable insights
- **Parameterization and Dashboard Development:** The inclusion of date range parameters in each worksheet empowered users to perform dynamic analysis based on their specific requirements. These parameters were seamlessly integrated into the dashboard, providing a user-friendly interface for exploring data trends and patterns.

- **Visualization and Interpretation:** Through visually compelling charts, graphs, and maps, the dashboard facilitated the interpretation of complex data sets.
- **Dashboard Cohesion and Navigation:** The cohesive integration of individual worksheets into a unified dashboard enhanced the overall user experience. Intuitive navigation features, including links to related dashboards and reports, provided users with additional context and insights to support their analysis.
- **Usability and Iterative Improvement:** Extensive testing and feedback gathering ensured that the dashboard met the needs and expectations of its intended users. Iterative design updates addressed any identified usability issues, resulting in a user-friendly and intuitive analytical tool.
- **Impact and Future Enhancements:** The completion of the project has already begun to make a positive impact on asset management and maintenance practices within the electrical distribution network. As stakeholders continue to leverage the insights provided by the dashboard, opportunities for further enhancements and refinements will emerge, driving continuous improvement in operational efficiency and reliability.

In conclusion, the successful completion of the project underscores the transformative potential of data analytics and visualization in optimizing asset performance and maintenance. By harnessing the power of data-driven insights, stakeholders can proactively identify and address issues, minimize downtime, and maximize the lifespan of critical assets.

CHAPTER 5

REFERENCES

- <https://www.tableau.com/>
- https://en.m.wikipedia.org/wiki/Tableau_Software
- <https://www.simplilearn.com/tutorials/tableau-tutorial/what-is-tableau>
- <https://www.salesforce.com/in/analytics/>
- <https://www.tutorialspoint.com/plsql/index.htm>
- <https://www.geeksforgeeks.org/plsql-introduction>
- <https://www.javatpoint.com/pl-sql-tutorial>