# Estimation of Business Expenses

## TEAM MEMBERS

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# Table of Contents

## 10. Conclusion

- Key Takeaways and Lessons Learned

## 11. Appendix

- Links to access project files

# 1.Introduction

**Project Overview**

The "Estimation of Business Expenses" project is an exploration into the world of business expenses, designed to provide a visual understanding of the various expenditures incurred by diverse businesses. It aims to showcase the distribution of expenses, identify key cost drivers, and highlight areas of potential optimization or concern. Through the power of data visualization, this project facilitates intuitive analysis, enabling a deeper comprehension of expenditure patterns and their implications for business performance.

**Objectives and Goals**

Main Objective:

The primary objective of this project is to develop a comprehensive data visualization solution using Tableau. It empowers financial analysts to gain insights into and optimize business expenses, enabling them to identify cost-saving opportunities, track spending patterns, and effectively communicate actionable insights.

Specific Goals:

1. Gain a deep understanding of the financial analyst persona through an empathy map.
2. Generate creative ideas for data visualization dashboards via brainstorming.
3. Prioritize dashboard ideas that align with the project's objectives.
4. Create a series of worksheets in Tableau that represent various aspects of business expenses.
5. Design and build three distinct dashboards: "Expense Breakdown," "Business Expenditure Overview," and "Expense Insights."
6. Merge these dashboards into a single navigable view using navigation buttons.
7. Develop a coherent narrative by creating a story in Tableau that presents insights effectively.
8. Publish the dashboards and story on Tableau Public, making them accessible to a broader audience.
9. Conclude the project by summarizing key learnings and identifying areas for future improvement.

# 2. Project Preparation

**Data Collection and Preparation**

Data is the cornerstone of our project, and it's essential to ensure that it's collected and prepared effectively. The dataset for this project has been graciously provided by our mentor. Here's how we've handled data collection and preparation:

**Data Collection:** Our mentor has provided us with a dataset that contains information on various businesses and their expenses. The dataset includes details on annual payroll, advertising and promotional expenses, employer and contract labor costs, and many other aspects of business expenditure. This dataset is the foundation upon which we'll build our data visualizations.

**Data Preparation:** Before we could start creating visualizations, we needed to ensure the data was clean, structured, and suitable for analysis. This involved activities such as removing duplicates, handling missing values, and formatting data fields appropriately. This step was crucial in ensuring that the visualizations accurately represent the business expenses.

**Installing and Setting Up Tableau**

Tableau is the tool we've chosen to bring our data to life through visualization. Here's how we set up and prepared Tableau for our project:

**Installation:** We began by downloading and installing Tableau Desktop on our computer. This software provides a robust environment for creating, designing, and publishing interactive data visualizations.

**Configuration:** With Tableau installed, we configured it according to our project's needs. This involved setting up data connections, ensuring compatibility with our dataset, and making sure Tableau was ready to handle the complexity of our business expense data.

By effectively handling data collection and preparation and setting up Tableau, we laid the foundation for the successful execution of our project, enabling us to proceed with creating meaningful data visualizations.

# 3. Understanding the Audience

**<u>Persona: Financial Analyst</u>**

In our project, the primary audience we aim to serve and empower is the "Financial Analyst." This persona plays a pivotal role in analyzing business expenses and making data-driven decisions. Here's a brief overview of our persona:

**<u>Empathy Map</u>**

To gain a deeper understanding of our financial analyst persona, we created an "Empathy Map." This map helps us visualize and comprehend what the persona says, thinks, does, and feels regarding their work and challenges. Here are the key components of the empathy map:

**Says:** The financial analyst often expresses the need for accurate and up-to-date expense data, challenges in tracking expenses, and the desire for faster insights.

**Thinks:** Their thoughts revolve around visualizing complex data, identifying cost-saving opportunities, and improving the efficiency of the analysis process.

**Does:** In their day-to-day activities, the financial analyst compiles reports, conducts variance analysis, collaborates with department heads, and creates visualizations.

**Feels:** Their emotions range from frustration with manual tasks to motivation when discovering opportunities for cost optimization. They can feel overwhelmed by data volume but empowered with the right tools.

## Empathy Map Insights

Through the empathy map, we've gained valuable insights into the needs, thoughts, actions, and emotions of our financial analyst persona. These insights are crucial for designing data visualizations that cater to their real-world challenges and provide meaningful solutions. The empathy map serves as a guiding light, ensuring that our project aligns with the persona's needs, and ultimately empowers them to optimize business expenses effectively.
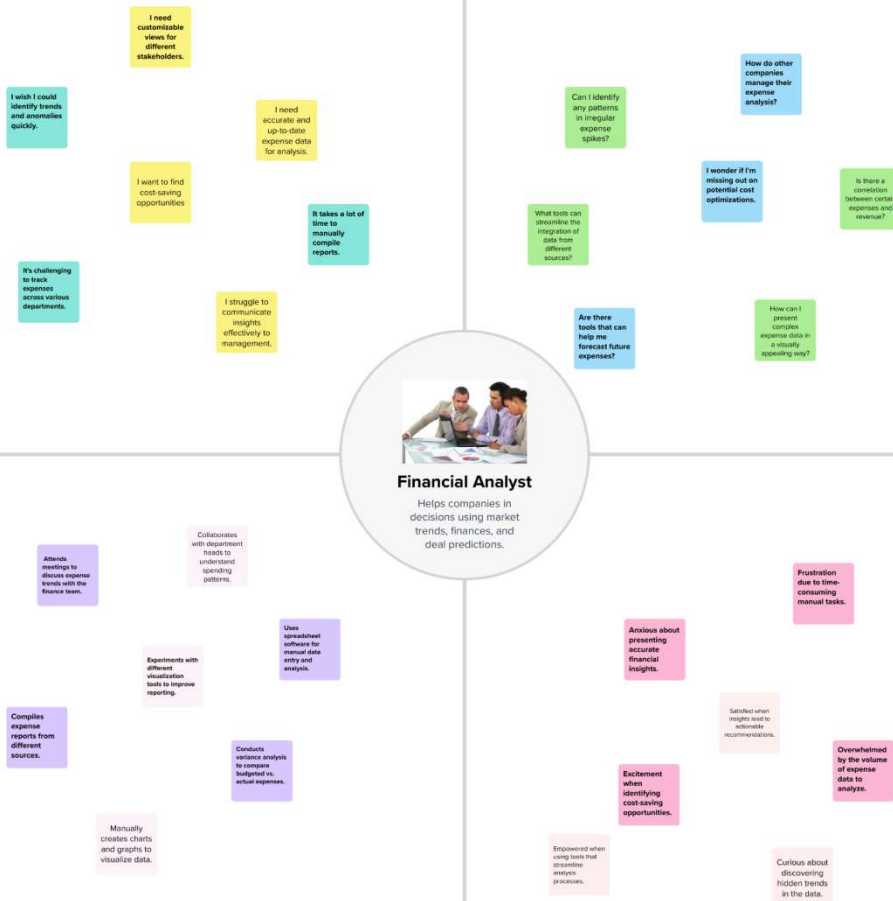
# Says

- I need customizable views for different stakeholders.
- I wish I could identify trends and anomalies quickly.
- I need accurate and up-to-date expense data for analysis.
- I want to find cost-saving opportunities
- It takes a lot of time to manually compile reports.
- It's challenging to track expenses across various departments.
- I struggle to communicate insights effectively to management.

# Thinks

- How do other companies manage their expense analysis?
- Can I identify any patterns in irregular expense spikes?
- I wonder if I'm missing out on potential cost optimizations.
- Is there a correlation between certain expenses and revenue?
- What tools can streamline the integration of data from different sources?
- Are there tools that can help me forecast future expenses?
- How can I present expense data in a visually appealing way?



**Financial Analyst**

Helps companies in decisions using market trends, finances, and deal predictions.

# Does

- Attends meetings to discuss expense trends with the finance team.
- Collaborates with department heads to understand spending patterns.
- Uses spreadsheet software for manual data entry and analysis.
- Experiments with different visualization tools to improve reporting.
- Compiles expense reports from different sources.
- Conducts variance analysis to compare budgeted vs. actual expenses.
- Manually creates charts and graphs to visualize data.

# Feels

- Frustration due to time-consuming manual tasks.
- Anxious about presenting accurate financial insights.
- Satisfied when insights lead to actionable recommendations.
- Overwhelmed by the volume of expense data to analyze.
- Excitement when identifying cost-saving opportunities.
- Empowered when using tools that streamline analysis processes.
- Curious about discovering hidden trends in the data.

# 4. Ideation and Brainstorming

## Problem Statement

To guide our project effectively, we started by framing a clear and focused problem statement. Our problem statement serves as the cornerstone of our ideation and brainstorming efforts. Here's our problem statement:

**Problem Statement:**
"How might we create meaningful visualizations to analyze and optimize business expenses?"

This problem statement encapsulates our project's primary objective, which is to empower financial analysts with insightful data visualizations for expense analysis and optimization.

## Brainstorming Session

With our problem statement in place, we initiated a brainstorming session. This creative process involved a collaborative effort to generate innovative ideas for data visualization dashboards. During the brainstorming session, the project team and stakeholders came together to explore different visualization possibilities. Here's an overview:

**Participants:** The brainstorming session involved team members, project stakeholders, and anyone who could contribute unique perspectives and ideas.

**Idea Generation:** Participants generated a wide range of ideas related to visualizing business expenses. The focus was on creativity and innovation without judgment.

## Prioritization of Ideas

Following the brainstorming session, we moved on to the essential step of prioritizing ideas. This step was crucial to ensure that the ideas align with our project goals and address the needs of our financial analyst persona. Here's how we prioritized the ideas:

**Evaluation Criteria:** We defined a set of criteria for evaluating each idea. These criteria considered factors such as feasibility, alignment with project goals, potential for providing insights, and resource requirements.

**Scoring:** Each idea was evaluated and scored against the established criteria. This allowed us to objectively assess the merits of each idea.

**Discussion and Decision:** We held discussions to review the scores and understand the rationale behind each rating. This process helped us narrow down the list to the most promising ideas.

Our ideation and brainstorming efforts were driven by the need to create data visualization dashboards that truly empower financial analysts in their expense analysis and decision-making processes.

# 5. Creating Worksheets in Tableau

## Worksheet 1: "Annual Payroll"

This worksheet focuses on visualizing annual payroll expenses across various businesses. It provides a clear representation of payroll costs and allows for comparisons between different entities. The chart displays the annual payroll of various businesses in descending order, highlighting the highest and lowest payroll entities.
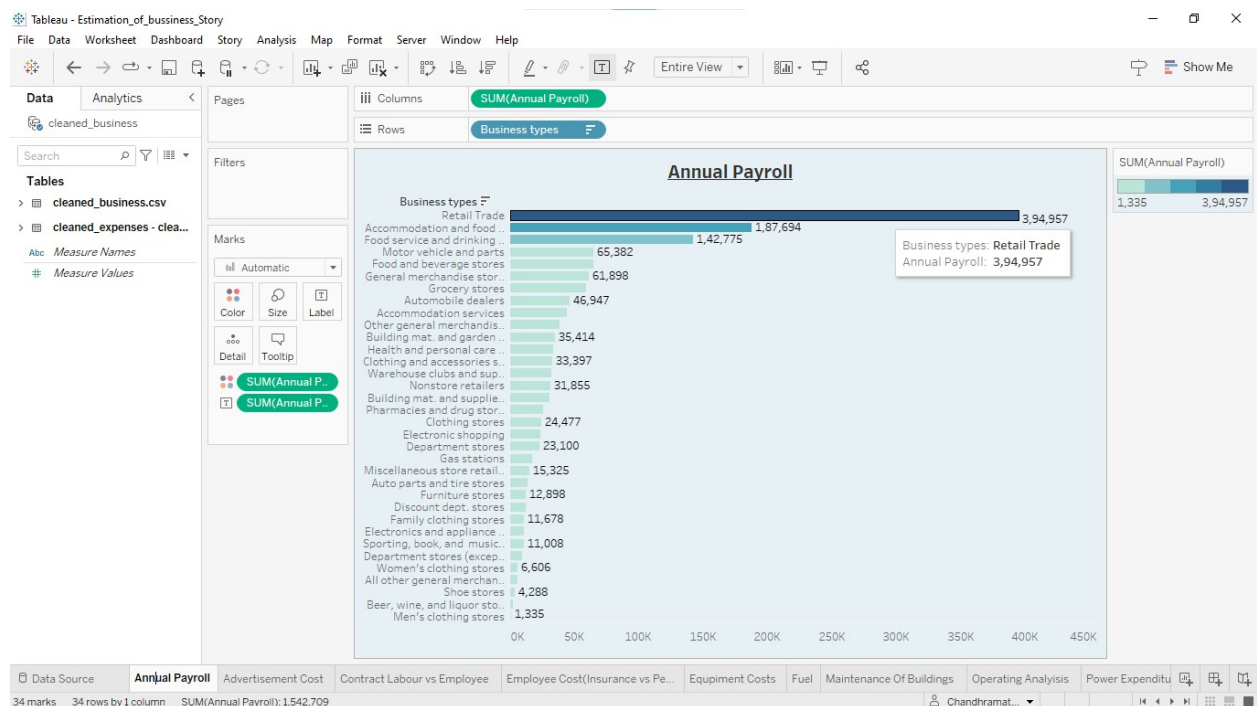
## Worksheet 2: "Advertising and Promotional Expenses"

This worksheet delves into advertising and promotional expenses, showcasing how different businesses allocate their budgets to these activities. The bubble chart illustrates the allocation of expenses, with the size of bubbles indicating the magnitude of spending. Accommodation and food services spend the most on advertising, as indicated by the bubble chart.
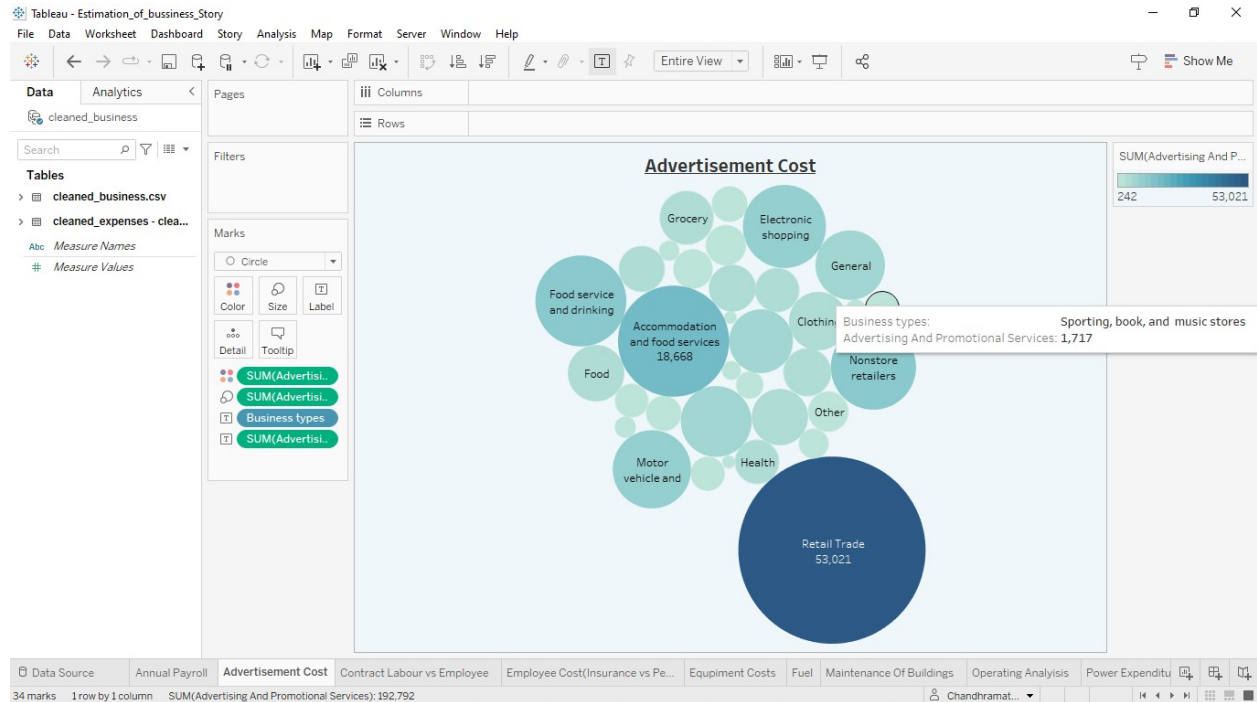
## Worksheet 3: "Employer and Contract Labor Costs"

This comparative bar graph chart presents the expenses of various businesses in both employer and contract labor costs. It enables the financial analyst to identify trends and variations in labor-related expenses, with retail trade businesses emerging as having the highest expenses in both areas.
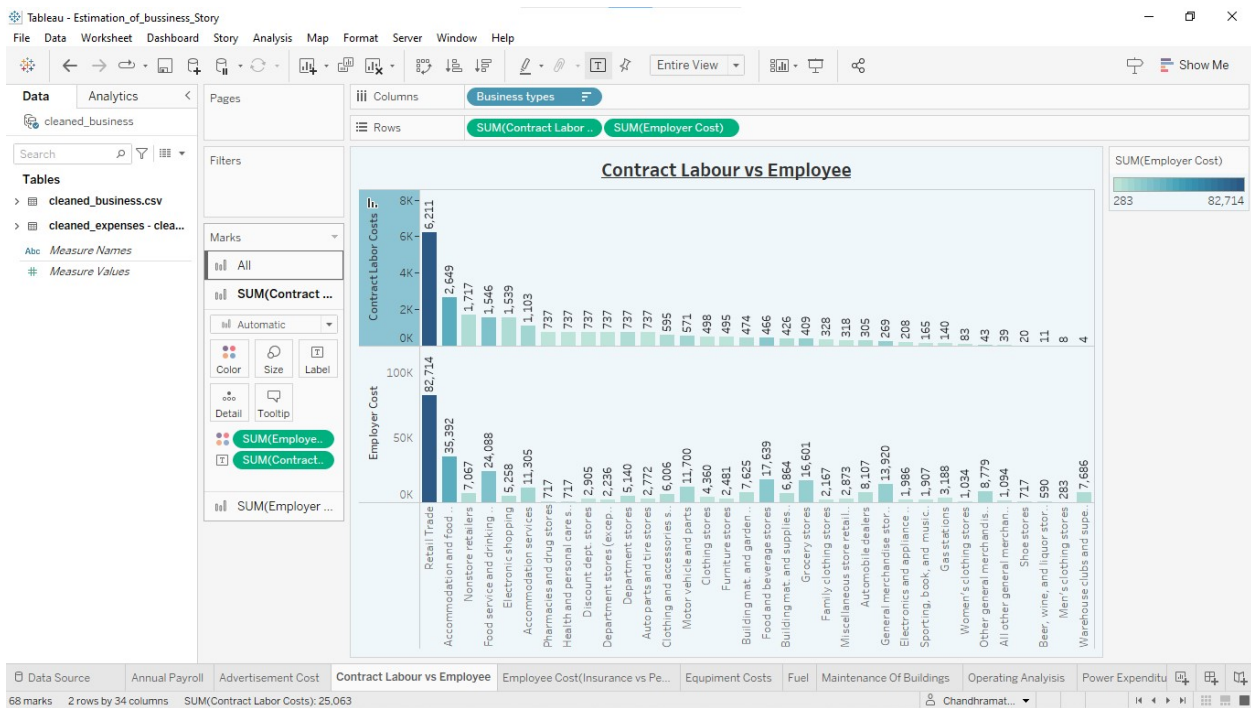
## Worksheet 4: "Employer Cost Health Insurance and Pension Plans"

Similar to Worksheet 3, this worksheet provides insights into employer costs associated with health insurance and pension plans. The comparative bar graph chart allows the financial analyst to understand the distribution of these expenses across different businesses. Retail trade again stands out with the highest expenses in both categories.
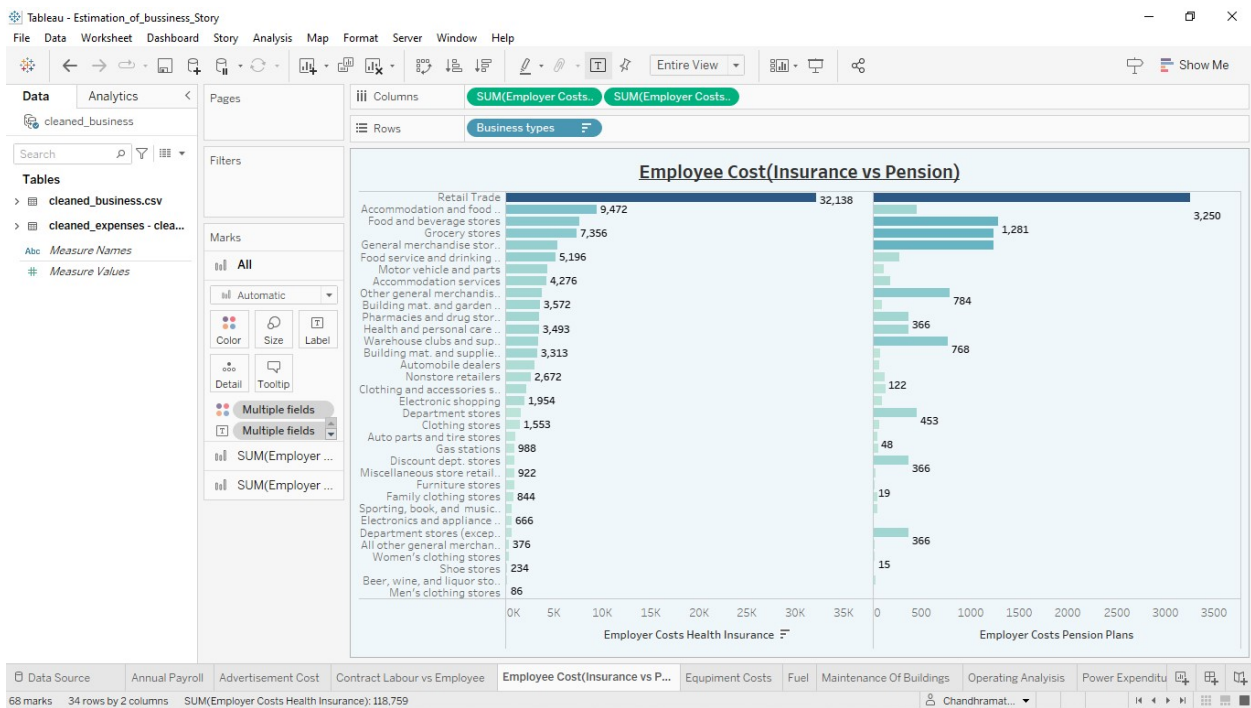
# Worksheet 5: "Expenditure on Equipment"

This worksheet focuses on businesses' expenditures on equipment. The chart displays how different businesses invest in equipment, and it's evident that retail trade allocates the most resources to this category.
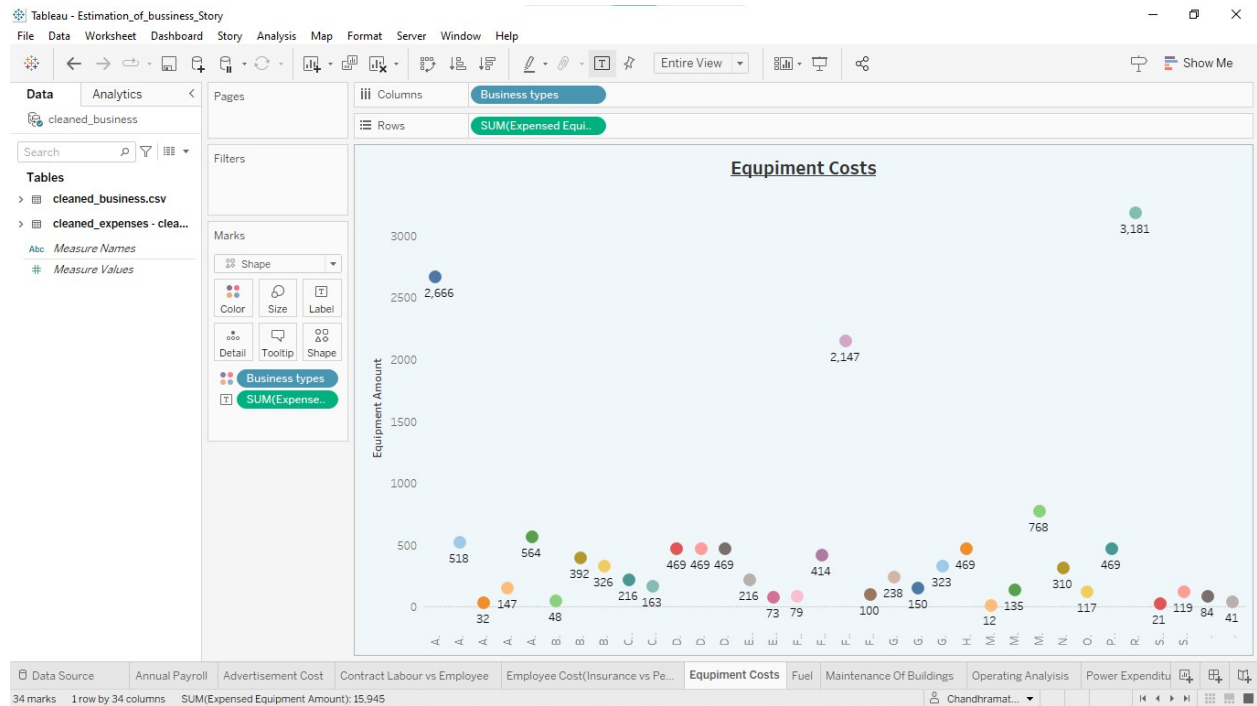
## Worksheet 6: "Expenditure on Fuels"

In this pie chart, businesses' expenditures on fuels are showcased. Accommodation and food services dominate in this field, accounting for a significant portion of the total expenditure (approximately 33.30%).
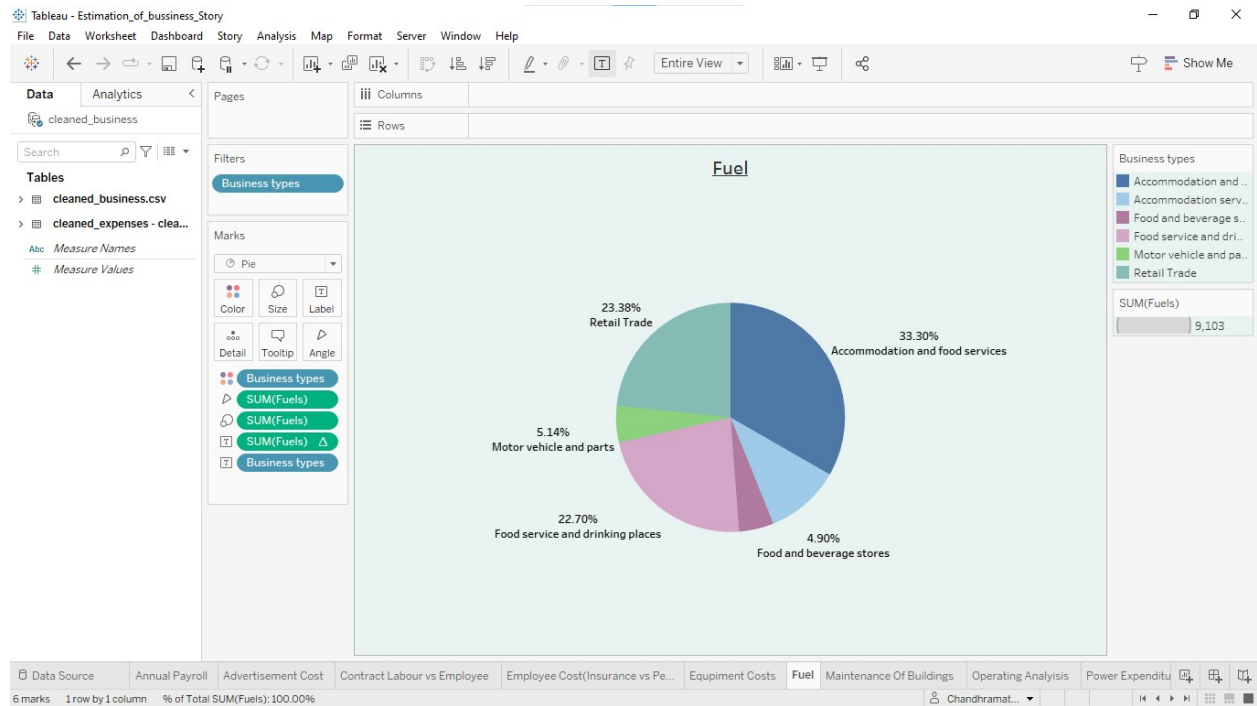
## Worksheet 7: "Maintaining Buildings"

This worksheet details the expenses incurred by various businesses in maintaining their buildings. Retail trade stands out with the highest expenses in this category.
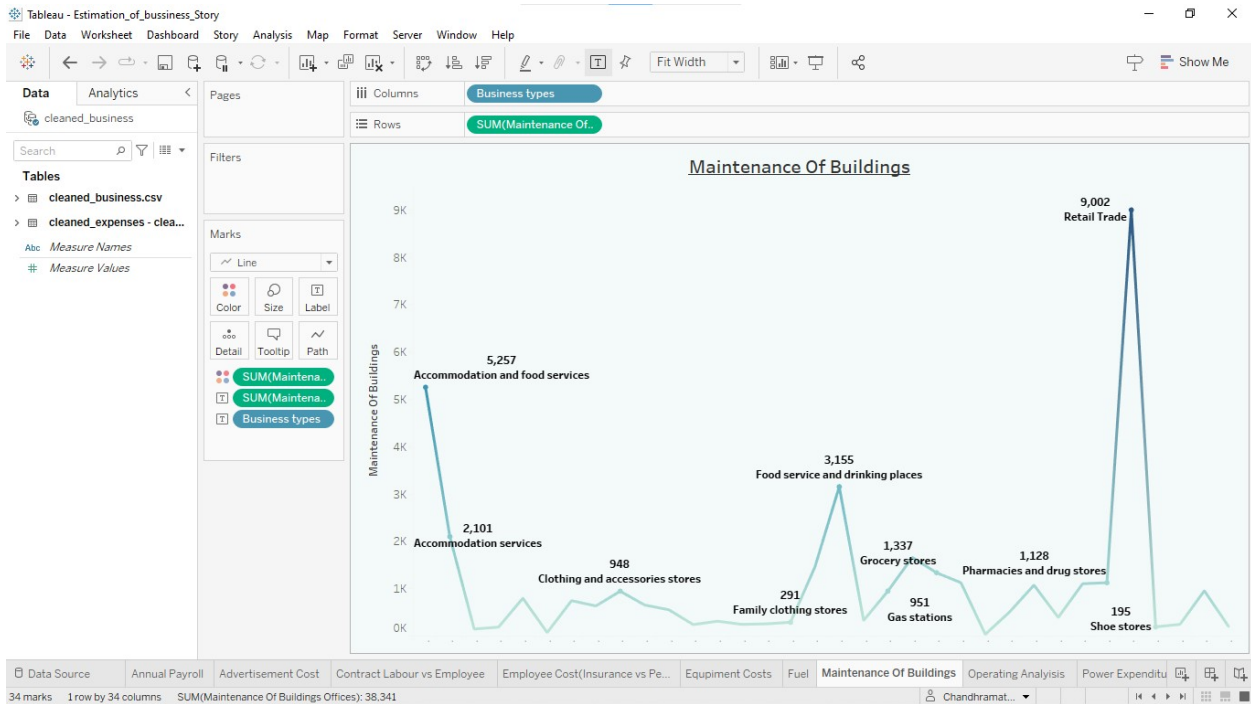
# Worksheet 8: "Electricity Bills"

It presents the expenses of various businesses in electricity bills, with retail trade being the highest spender in this area.
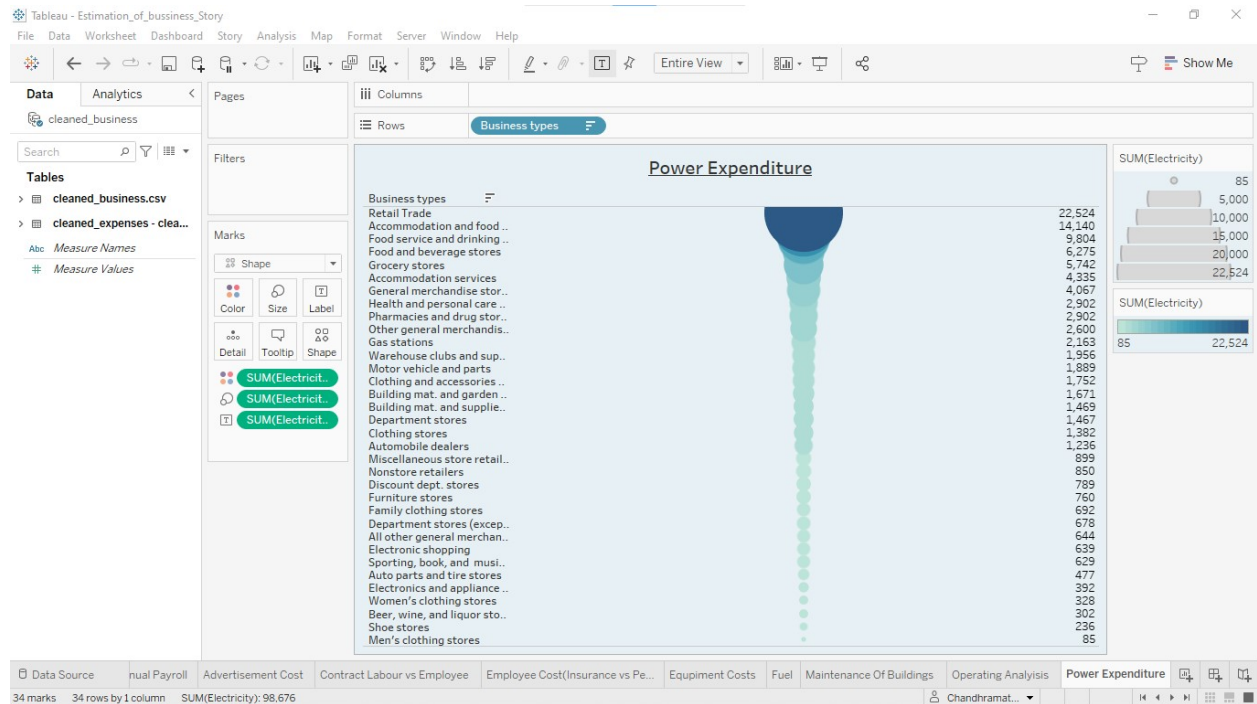
## Worksheet 9: "Rental of Machinery"

This worksheet focuses on the rental expenses incurred by businesses for machinery. Retail trade again leads in this category, indicating their substantial investment in rented machinery.
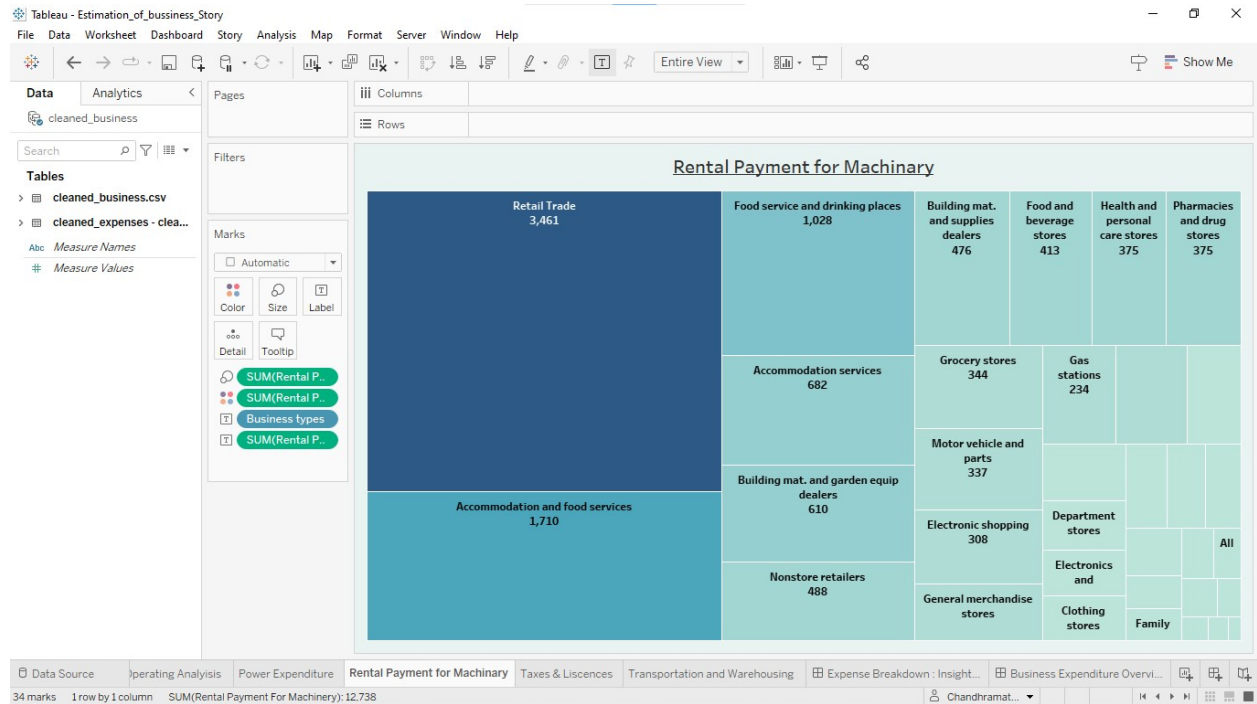
## Worksheet 10: "Expenditure on Taxes and Licenses"

A pie chart is used to illustrate the expenditure of various businesses on taxes and licenses. Retail trade dominates this category with approximately 34.35% of the total expenditure.
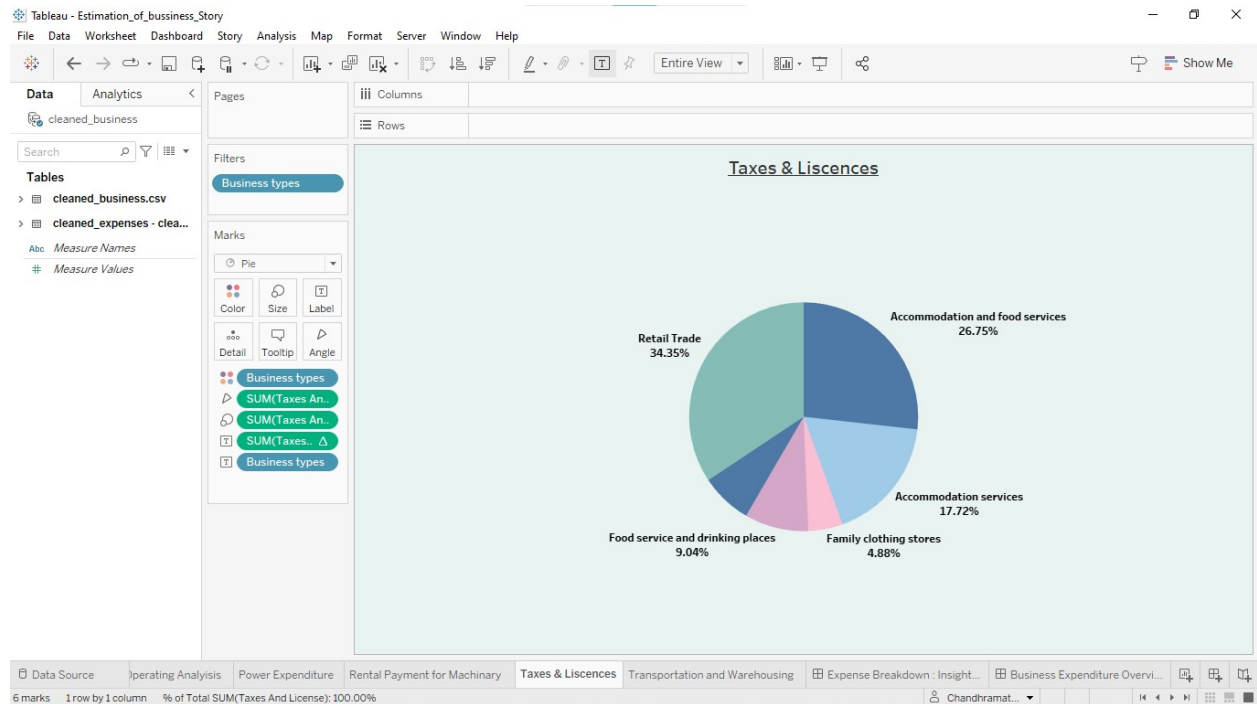
## Worksheet 11: "Transportation, Shipping, and Warehousing"

This worksheet provides insights into the expenditure of various businesses on transportation, shipping, and warehousing. Retail trade emerges with the highest expenditure in this category.
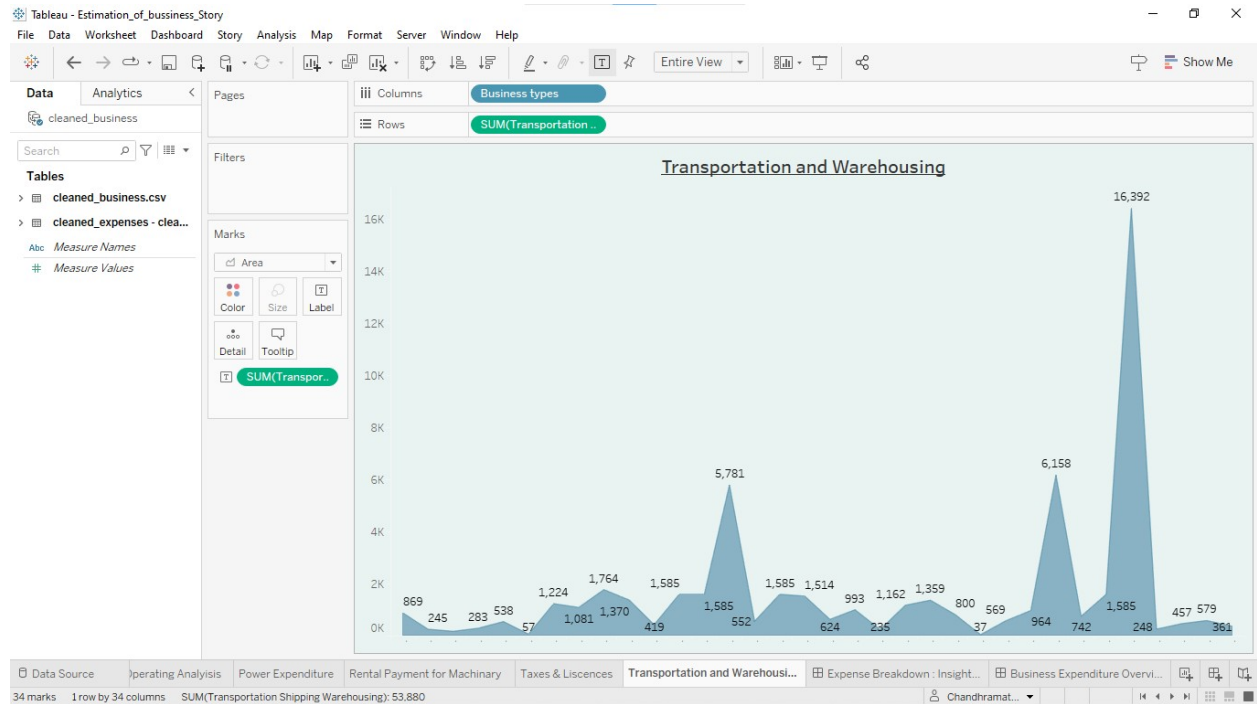
## Worksheet 12: "Operational Expenses"

Using a bubble chart, this worksheet visualizes the operational expenses of various businesses. Retail trade again leads in operational expenses, highlighting the significant resources allocated to this aspect of their business.
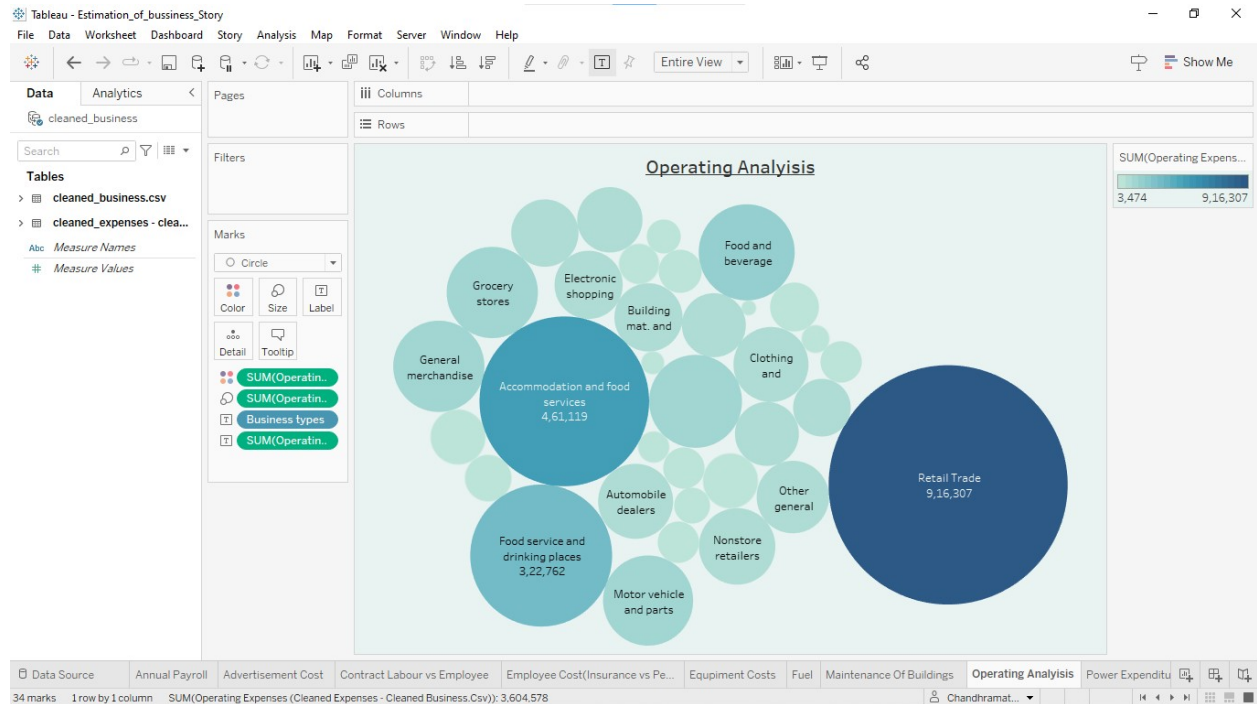
# 6. Creating Dashboards

**Dashboard 1: "Expense Breakdown"**

"Expense Breakdown" is designed to provide a comprehensive understanding of various aspects of business expenses. It combines insights from several worksheets:

- "Annual Payroll" worksheet to showcase the annual payroll of businesses.
- "Employer and Contract Labor Costs" and "Employer Cost Health Insurance and Pension Plans" worksheets for labor cost breakdown.
- "Maintaining Buildings," "Electricity Bills," and "Rental of Machinery" worksheets, highlighting expenses related to maintenance, utilities, and machinery rental.

This dashboard offers an in-depth overview of where businesses allocate their resources and how these expenses contribute to their financial landscape.

# Expense Breakdown : Insights into Diverse Business Costs

## Annual Payroll

Business types

| Business type | Value |
|---|---|
| Retail Trade | 3,94,957 |
| Accommodation and food .. | |
| Food service and drinking .. | |
| Motor vehicle and parts | |
| Food and beverage stores | 65,074 |
| General merchandise stor.. | |
| Grocery stores | 59,408 |
| Automobile dealers | |
| Accommodation services | 44,919 |
| Other general merchandis.. | |
| Building mat. and garden .. | 35,414 |
| Health and personal care .. | |
| Clothing and accessories s.. | 33,397 |
| Warehouse clubs and sup.. | |
| Nonstore retailers | 31,855 |
| Building mat. and supplie.. | |
| Pharmacies and drug stor.. | 26,322 |
| Clothing stores | |
| Electronic shopping | 24,175 |
| Department stores | |
| Gas stations | 17,508 |
| Miscellaneous store retail.. | |
| Auto parts and tire stores | 13,857 |
| Furniture stores | |
| Discount dept. stores | 12,890 |
| Family clothing stores | |
| Electronics and appliance .. | 11,044 |
| Sporting, book, and music.. | |
| Department stores (excep.. | 10,210 |
| Women's clothing stores | |
| All other general merchan.. | 6,130 |
| Shoe stores | |
| Beer, wine, and liquor sto.. | 3,163 |
| Men's clothing stores | |

0K   100K   200K   300K   400K   500K

## Operating Analyisis

Accommodation and food services 4,61,119

Retail Trade 9,16,307

Food service and drinking

## Maintenance Of Buildings

Maintenance Of Buildings

8K

6K — 5,257 Accommodation and food services

4K

2K — 2,101 Accommodation services

948 Clothing and accessories stores

3,155 Food service and drinking places

291 Family clothing stores

1,337 Grocery stores

951 Gas stations

1,128 Pharmacies and drug stores

9,002 Retail Trade

195 Shoe stores

0K

## Dashboard 2: "Business Expenditure Overview"

"Business Expenditure Overview" provides a high-level perspective on various expense categories. It combines insights from the following worksheets:

- "Advertising and Promotional Expenses" for insights into marketing expenses.
- "Expenditure on Equipment" to visualize investments in equipment.
- "Expenditure on Fuels" to understand fuel-related costs.
- "Expenditure on Taxes and Licenses" to explore the impact of regulatory and tax obligations.
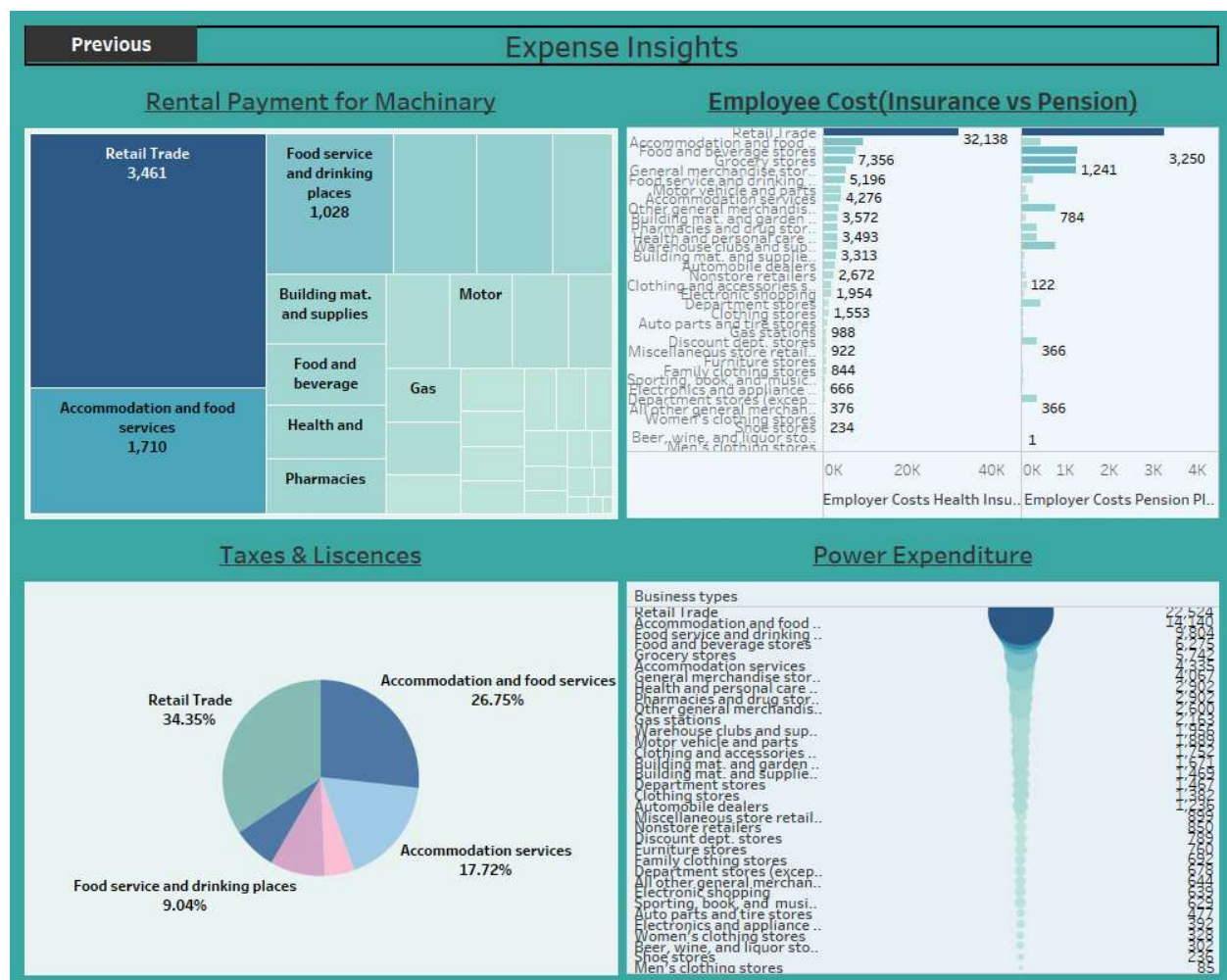


This dashboard allows the financial analyst to make quick comparisons and identify areas of expenditure that may require attention.

## Dashboard 3: "Expense Insights"

"Expense Insights" offers a deep dive into crucial aspects of business expenses and leverages insights from multiple worksheets:

- "Transportation, Shipping, and Warehousing" to gain insights into logistics and transportation costs.
- "Operational Expenses" to understand general operational costs.
- "Maintaining Buildings" and "Electricity Bills" to visualize facility-related expenses.
- "Annual Payroll" for labor cost analysis.



This dashboard equips the financial analyst with detailed insights into areas that may require optimization, cost-cutting, or further analysis.

# 7. Combining Dashboards into a Single View

**Navigation Buttons and Interactivity**

To enhance the user experience and provide a seamless way to access insights across all three dashboards, we've combined them into a single view with the help of navigation buttons and interactive features. Here's how we achieved this:

**Navigation Buttons:**
- We implemented navigation buttons within each dashboard to allow the financial analyst to switch between "Expense Breakdown," "Business Expenditure Overview," and "Expense Insights" effortlessly.
- These buttons are strategically placed for user convenience, enabling them to explore the specific insights they need with a simple click.

**Interactivity:**
- Interactive elements, such as tooltips and filters, have been integrated into the dashboards to provide a dynamic and engaging experience.
- Tooltips offer additional information and context when users hover over data points, making it easier to interpret the visualizations.
- Filters allow users to customize their view by selecting specific business categories, time frames, or expense categories.

The combined view, with these navigation and interactivity features, ensures that the financial analyst can seamlessly transition between different perspectives and drill down into specific areas of interest. This approach enhances the overall user experience and facilitates a comprehensive understanding of business expenses.

# 8. Creating a Story

**Story Overview**

A key aspect of our project is to tell a compelling and coherent narrative that ties together the insights from our dashboards. This is where the "Story" in Tableau comes into play. Here's an overview of our story:

**Objective:**
Our story aims to provide a structured narrative that guides the financial analyst through a journey of understanding and optimizing business expenses. It synthesizes the insights gained from the individual dashboards and presents them in a cohesive manner.
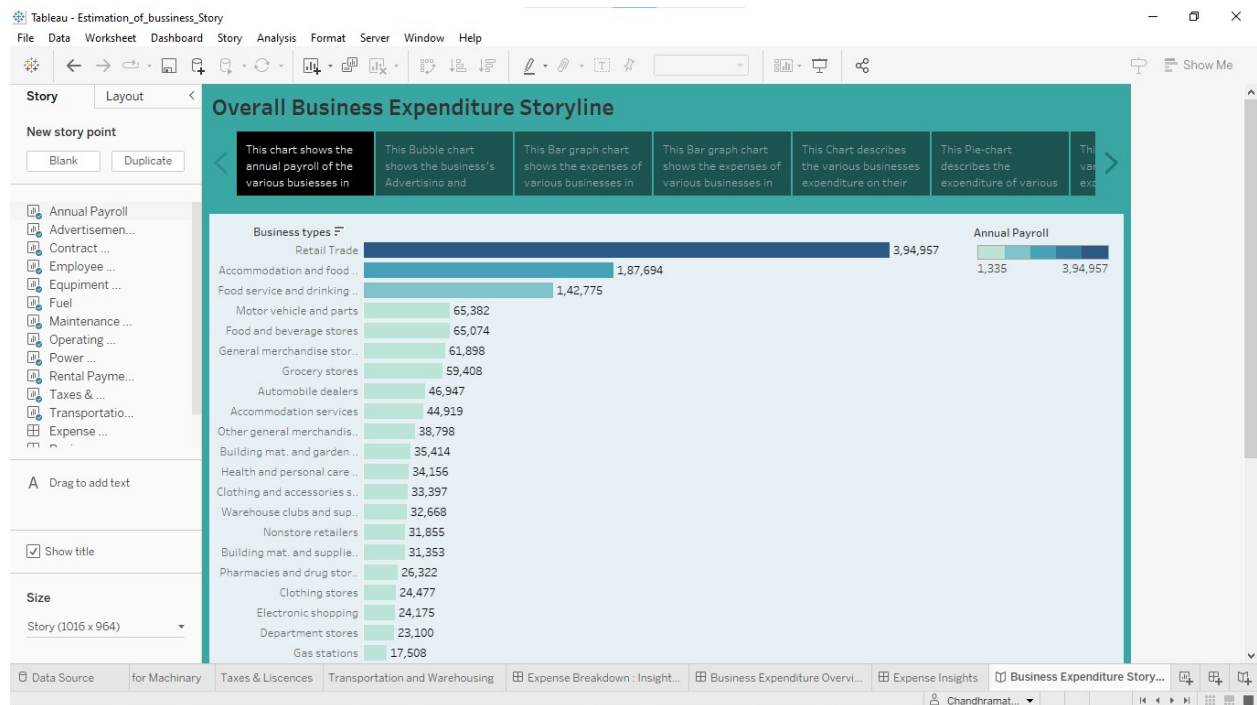


**Interactive Elements:**
- Throughout the story, we've incorporated interactive elements such as tooltips, filters, and navigation buttons to make the narrative engaging and user-friendly.

# 9. Publishing on Tableau Public

**Preparing for Publishing**

Before sharing our project on Tableau Public, we took several preparatory steps to ensure a smooth and effective publishing process:

**Validation and Testing:**
- We thoroughly validated and tested all dashboards, worksheets, and the story to verify that they function correctly and provide accurate insights.

**Data Security:**
- We ensured that sensitive or confidential data was appropriately handled and excluded from the public version of the project to maintain data security.

**Optimizing Performance:**
- We optimized the performance of our visualizations to ensure they load quickly and are responsive.

**Uploading Dashboards and Story**

After completing the preparation steps, we proceeded with the uploading process to Tableau Public:

**Dashboard Upload:** We uploaded each of the three dashboards, namely "Expense Breakdown," "Business Expenditure Overview," and "Expense Insights" in a single Dashboard to Tableau Public.

**Story Upload:** The story that guides the financial analyst through our narrative was also uploaded, allowing users to access all insights in a structured manner.

# 10. Conclusion

**Key Takeaways and Lessons Learned**

In concluding our project, we reflect on the key takeaways and lessons learned throughout the journey:

**Key Takeaways:**

- Data Visualization Empowers: We've learned that data visualization is a powerful tool for making complex information more accessible and actionable. It enables our financial analyst persona to gain a deeper understanding of business expenses.
- User-Centric Design: Understanding the needs and challenges of our financial analyst persona through the empathy map was a crucial step. Designing with the end user in mind led to more meaningful and relevant visualizations.
- Collaboration and Ideation: Our brainstorming sessions fostered creativity and innovation. We discovered that a diverse set of perspectives can lead to better solutions and more impactful visualizations.
- Optimization Opportunities: Through our project, we've identified areas where businesses can optimize their expenses, whether it's in labor costs, equipment expenditures, or other categories.

**Lessons Learned:**
- Data Preparation is Key: We've learned that data preparation is a time-consuming but essential step. Clean and well-structured data is the foundation of effective data visualization.
- Context Matters: Providing context for visualizations is crucial. The annotations and descriptions we added helped users interpret the data more effectively.
- Iterative Process: Building dashboards and a story is an iterative process. We refined our visualizations and narrative as we progressed to make them more impactful.

**Future Recommendations**

As we conclude this project, we also look ahead to future recommendations:

- Continuous Improvement: We recommend regularly updating the project with new data to provide ongoing insights into evolving business expenses.

## 11. Appendix

DASHBOARD :
https://public.tableau.com/views/Estimation_of_bussiness_Dashboard/ExpenseBreakdownInsightsintoDiverseBusinessCosts?:language=en-US&:display_count=n&:origin=viz_share_link

Story :
https://public.tableau.com/views/Estimation_of_bussiness_Story/BusinessExpenditureStorylineOverall?:language=en-US&:display_count=n&:origin=viz_share_link

Demonstration Video : https://youtu.be/gLiuDS1YraE?si=Q4aNV_QT226cp1-x