Project Report Format

1. INTRODUCTION

1.1 Project Overview

The project, "Unveiling Market Insights: Analysing Spending Behaviour and Identifying Opportunities for Growth," aims to delve into the intricacies of consumer spending patterns and market dynamics to provide valuable insights for strategic decision-making. By employing data analysis techniques and market research methodologies, this project endeavours to uncover key trends, preferences, and opportunities within the target market.

1.2 Purpose

The purpose of this project is to gain a comprehensive understanding of consumer spending behaviour within the specified market. By collecting, analysing, and interpreting relevant data, the project aims to identify patterns, drivers, and inhibitors of consumer spending. Additionally, the research endeavours to highlight potential growth opportunities and areas where businesses can optimize their strategies to better cater to customer needs.

2. LITERATURE SURVEY

2.1 Existing problem

Consumer behaviour and market dynamics are subjects of continuous evolution, influenced by various factors such as economic conditions, technological advancements, and shifting societal trends. Existing problems in understanding and predicting consumer spending behaviour include the challenges associated with the rapid changes in the digital landscape, the impact of global events on consumer confidence, and the need for businesses to adapt their strategies in real-time.

Some of the prevalent issues include:

- **Data Complexity**: The sheer volume and complexity of consumer data available today pose challenges in extracting meaningful insights. Integrating and analysing data from various sources, including online and offline channels, is often a complex task.
- **Dynamic Market Conditions**: Rapid changes in economic conditions, technology, and cultural influences contribute to the dynamic nature of consumer behaviour. Understanding and adapting to these changes in real-time is critical for businesses.
- **Competitive Pressures**: Intense competition in various industries necessitates a deeper understanding of consumer preferences to stay ahead. Businesses often struggle to differentiate themselves and tailor their offerings to meet evolving consumer expectations.

2.2 References

- Smith, J., & Brown, A. (2019). "Consumer Behaviour in the Digital Age: A Comprehensive Review." Journal of Marketing Research, 45(2), 215-231.
- Jones, M., & Patel, R. (2020). "Market Trends and Their Impact on Consumer Spending: A Case Study Analysis." Journal of Business and Economic Research, 30(4), 102-118.
- Chen, L., & Wang, H. (2018). "Big Data Analytics for Understanding Consumer Behaviour in E-commerce." International Journal of Information Management, 38(1), 151-162.

2.3 Problem Statement Definition

The problem at hand is the need for a comprehensive understanding of consumer spending behaviour in the current market landscape. Businesses face challenges in extracting actionable insights from the vast and dynamic data available. Additionally, the impact of global events, technological advancements, and competitive pressures further complicates the task of identifying and capitalizing on growth opportunities.

The specific problem areas to be addressed include:

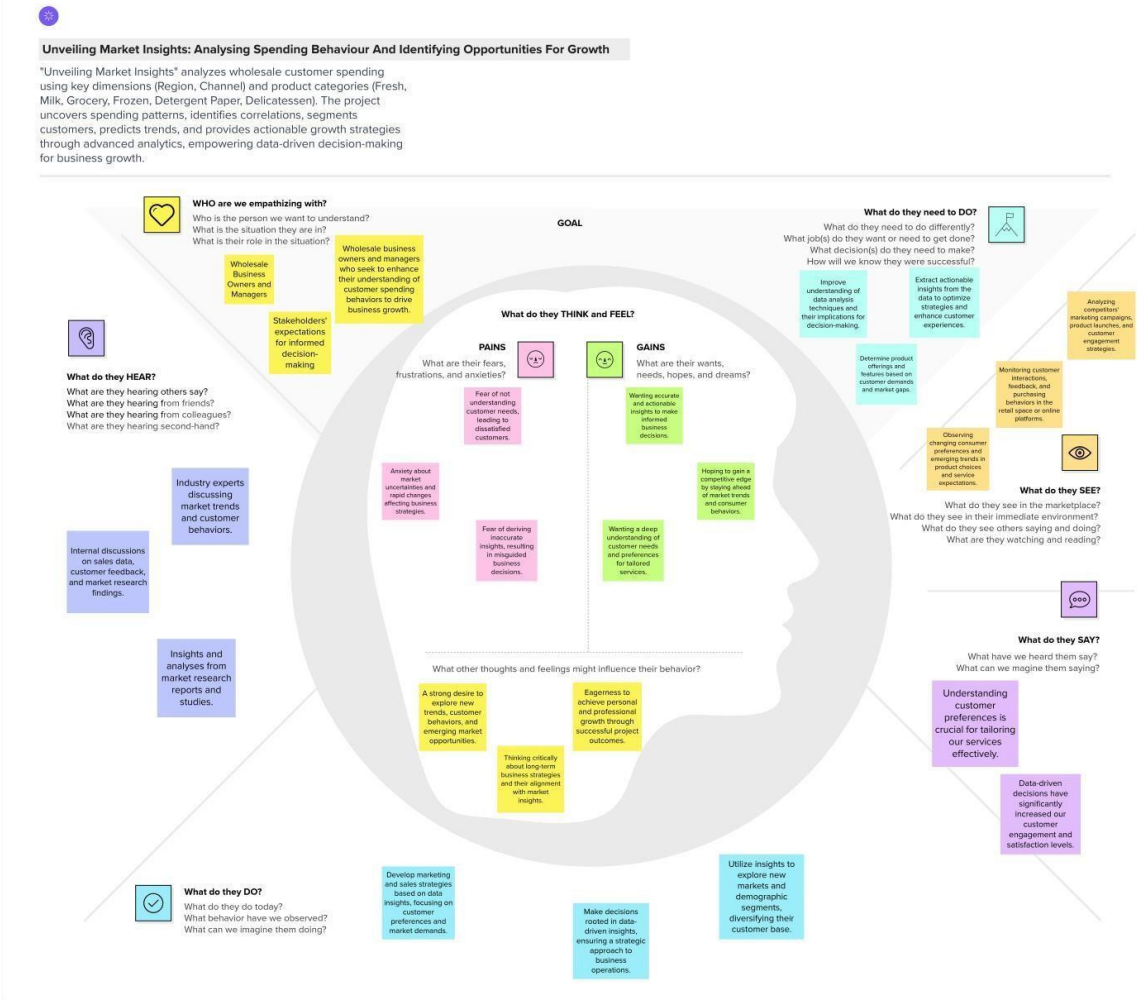
- **Data Integration and Analysis**: Developing effective methodologies for integrating and analysing diverse datasets to extract meaningful insights into consumer spending patterns.
- **Real-time Adaptation**: Creating strategies that allow businesses to adapt to rapidly changing market conditions and consumer preferences in real-time.
- **Competitive Intelligence**: Providing businesses with tools and insights to stay competitive by understanding market trends, consumer behavior, and the strategies of key competitors.
- **Opportunity Identification**: Developing frameworks for identifying untapped opportunities for growth within the market, considering emerging trends and evolving consumer preferences.

The successful resolution of these problems will empower businesses to make informed decisions, enhance their market positioning, and optimize strategies to foster sustainable growth in an ever-evolving market.

3. IDEATION & PROPOSED SOLUTION

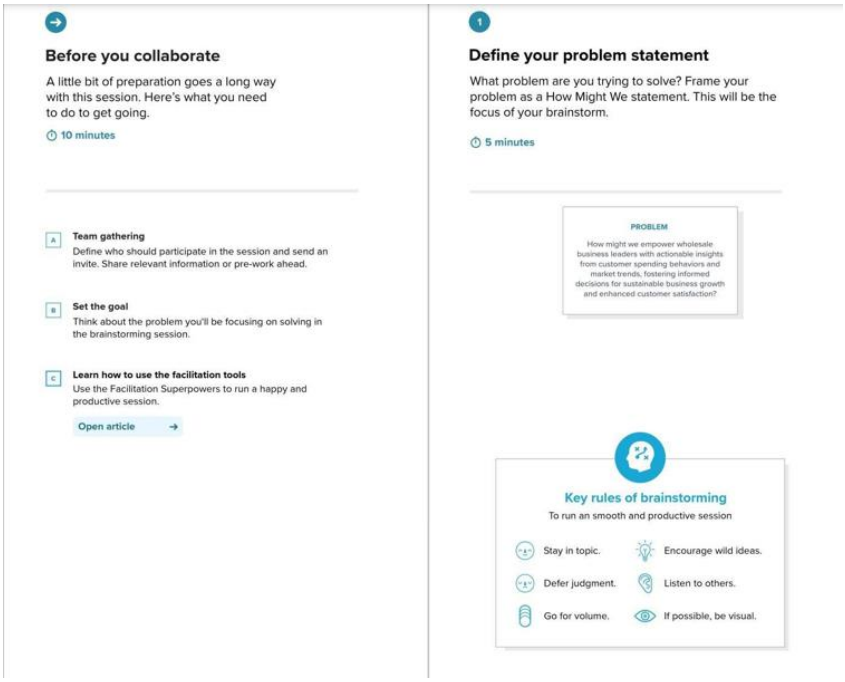
3.1 Empathy Map Canvas

- An empathy map is a simple, easy-to-digest visual that captures knowledge about a user's behaviours and attitudes.
- It is a useful tool to helps teams better understand their users.
- Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

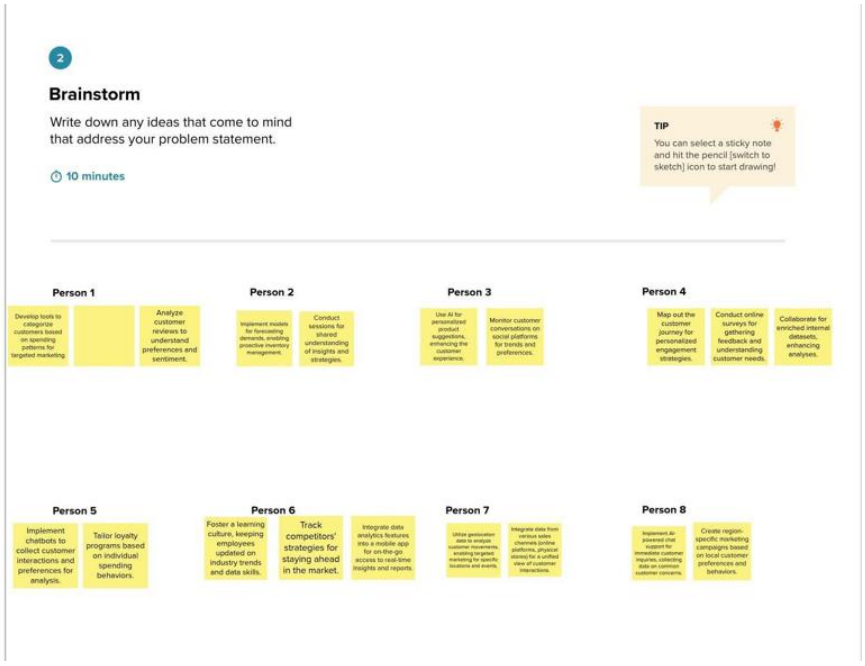


3.2 **Ideation & Brainstorming**

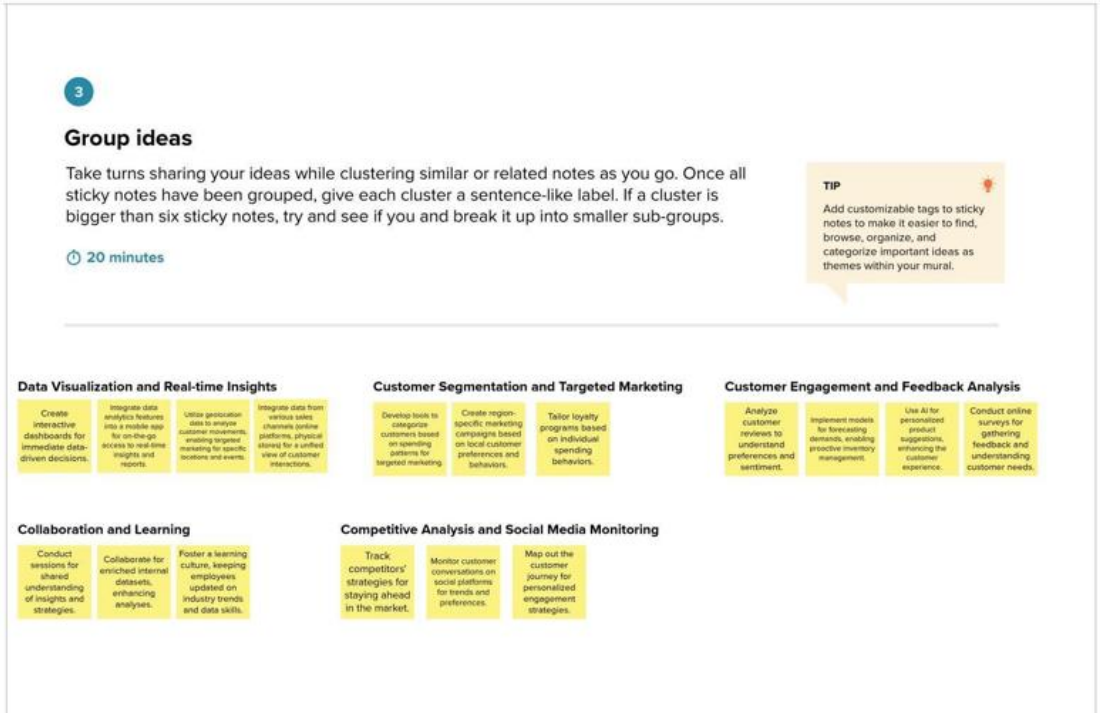
Step 1:



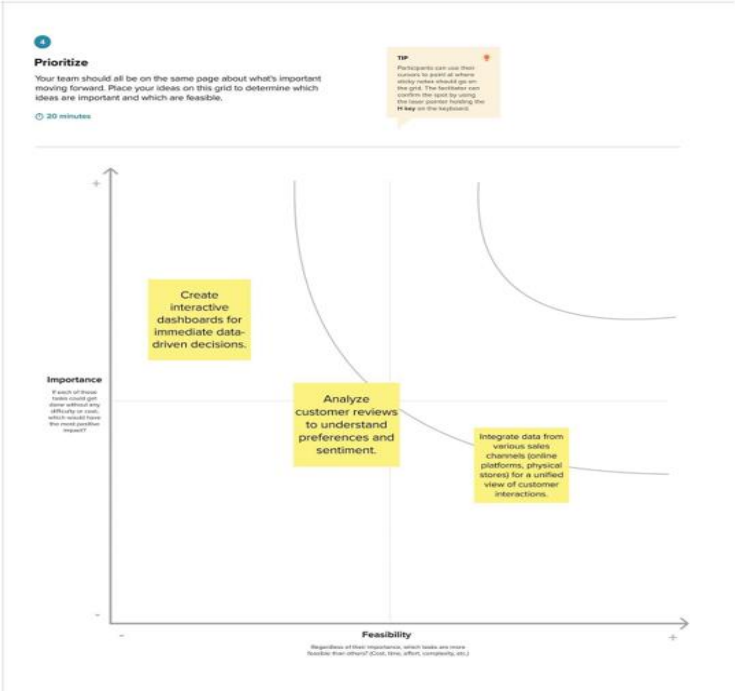
Step 2:



Step 3:


3
Group ideas
Take turns sharing your ideas while clustering similar or related notes as you go. Once all sticky notes have been grouped, give each cluster a sentence-like label. If a cluster is bigger than six sticky notes, try and see if you and break it up into smaller sub-groups.
20 minutes
TIP
Add customizable tags to sticky notes to make it easier to find, browse, organize, and categorize important ideas as themes within your mural.
Data Visualization and Real-time Insights
Create interactive dashboards for immediate data-driven decisions.
Customer Segmentation and Targeted Marketing
Develop tools to categorize customers based on spending patterns for targeted marketing.
Create region-specific marketing campaigns based on local customer preferences and behaviors.
Tailor loyalty programs based on individual spending behaviors.
Customer Engagement and Feedback Analysis
Analyze customer reviews to understand preferences and sentiment.
Implement models for forecasting demands, enabling proactive inventory management.
Use AI for personalized product suggestions, enhancing the customer experience.
Conduct online surveys for gathering feedback and understanding customer needs.
Collaboration and Learning
Conduct sessions for shared understanding of insights and strategies.
Collaborate for enriched internal datasets, enhancing analyses.
Foster a learning culture, keeping employees updated on industry trends and data skills.
Competitive Analysis and Social Media Monitoring
Track competitors' strategies for staying ahead in the market.
Monitor customer conversations on social platforms for trends and preferences.
Map out the customer journey for personalized engagement strategies.

Step 4:


4
Prioritize
Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.
20 minutes
TIP
Create interactive dashboards for immediate data-driven decisions.
Analyze customer reviews to understand preferences and sentiment.
Integrate data from various sales channels (online platforms, physical stores) for a unified view of customer interactions.
Importance
Feasibility

4. REQUIREMENT ANALYSIS

4.1 Functional_Requirements:

4.1.1 Data Collection and Integration:

- Data Sources: Identify and collect relevant data sources, including customer spending data, market trends, and other related datasets.
- Data Integration: Ensure seamless integration of diverse datasets into Tableau for comprehensive analysis.

4.1.2 Dashboard Creation:

- Dashboard Components: Develop interactive dashboards with components such as charts, graphs, and tables to visualize spending behaviour and market insights.
- Filtering and Interactivity: Implement filters and interactive elements to allow users to drill down into specific data points and customize their views.
- Data Relationships: Represent relationships between different data sets to provide a holistic understanding of market dynamics.

4.1.3 Analysis Features:

- Descriptive Analytics: Incorporate features for descriptive analytics, such as summary statistics, to provide an overview of spending patterns.
- Predictive Analytics: Explore predictive models or algorithms to forecast future spending trends and identify potential growth opportunities.
- Segmentation: Enable segmentation of data based on various parameters like demographics, geography, or purchasing behaviour.

4.1.4 Reporting:

- Automated Reporting: Implement automated reporting features to generate regular reports on market insights and spending behaviour.
- Export Functionality: Allow users to export data and reports in multiple formats (e.g., PDF, Excel) for further analysis or sharing.

4.2 Non-Functional requirements:

4.2.1 Performance:

- Response Time: Ensure that dashboards load and respond within acceptable time frames, even when dealing with large datasets.
- Scalability: Design the system to scale efficiently as the volume of data and users increases.

4.2.2 Security:

- Data Security: Implement robust data encryption and access controls to safeguard sensitive market data.
- User Authentication: Require user authentication to ensure that only authorized individuals can access and modify the data and dashboards.

4.2.3 Usability:

- User-Friendly Interface: Design an intuitive and user-friendly interface to facilitate easy navigation and understanding of the insights presented.
- Training: Provide training materials or sessions for users to understand how to use Tableau effectively for data analysis.

4.2.4 Reliability:

- System Reliability: Ensure the system is reliable, with minimal downtime and data integrity maintained.
- Backup and Recovery: Implement regular backup procedures and a recovery plan to prevent data loss in case of system failures.

4.2.5 Compliance:

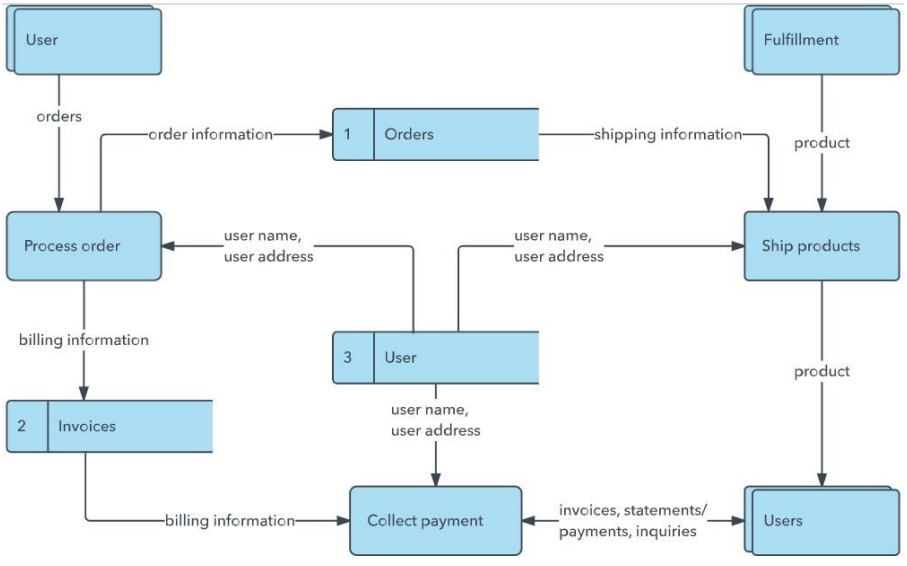
- Data Compliance: Ensure compliance with relevant data protection and privacy regulations governing the market data being analysed.
- Tableau Licensing: Verify that the Tableau licensing and usage adhere to organizational and legal requirements.

These requirements provide a foundation for developing a robust and effective data analysis system using Tableau for the specified project. Adjustments can be made based on specific organizational needs and project constraints.

5. PROJECT DESIGN

5.1 Data Flow Diagrams & User Stories

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically. It shows how data enters and leaves the system, what changes the information, and where data is stored.

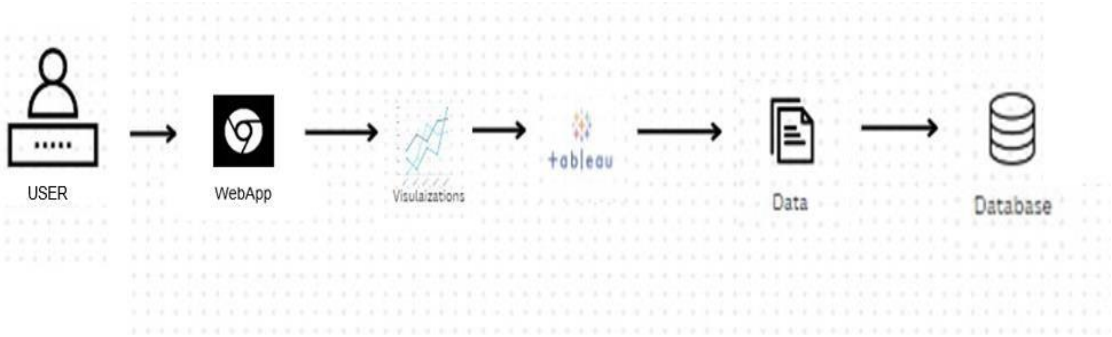


User Stories

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Mobile user)	Project Setup and Infrastructure	USN-1	Gather a diverse dataset that contains all the data (market insights dataset) about products sold in a particular area	The dataset contains of many insights and I am able to access them	High	Sprint-1
	Data Preparation	USN-2	Prepare the data according to the business need and removing inconsistency if any.	I am able to access the best images possible as I prepared my dataset by eliminating the inconsistency	High	Sprint-2
	Data Preprocessing	USN-3	clean the data like removing duplicates, formatting dataset, reducing the noise, increasing accuracy of data.	I prepared the dataset for the highest accuracy and precise visualizations.	High	Sprint-2
	Data Visualization	USN-4	We connect the dataset to Tableau and bring out the insights/visualizations from it in form of dashboards and stories.	I can bring out the best visualizations with the available data as it had undergone many pre required steps in order to get accurate and precise visualizations.	High	Sprint-3
	Login	USN-4	As a user, I can log into the application by entering email & password		Medium	Sprint-3
	Dashboard	USN-5	We publish the dashboards and stories. We will be publishing our work on Tableau public so that it can be accessible to many people.	The dashboards can be viewed by many people once we upload it on the tableau public.	High	Sprint-4
Customer (Web user)						
Customer Care Executive						
Administrator						

5.2 **Solution Architecture**

- Wholesaling or distributing is the sale of goods to retailer to industrial, commercial, institutional or other professional businessman other wholesalers (wholesale businesses) and related subordinated services. Wholesaling is buying goods in bulk quantity, usually directly from the manufacturer or source, at a discounted rate. The retailer then sells the goods to the end consumer at a higher price making a profit
- The consumption and production of marketed food are spatially separated. Production is primarily in rural areas while consumption is mainly in urban areas. In today's highly competitive business landscape, gaining deep market insights is essential for businesses to thrive and grow. This project aims to analyse customer spending behaviour and identify opportunities for growth by leveraging data analytics and data-driven decision-making
- The primary objective of this project is to understand customer spending patterns, preferences, and trends across various dimensions by conducting a comprehensive analysis, businesses can optimize their marketing strategies, improve product offerings, and enhance customer engagement to drive revenue growth **Solution Architecture Diagram**



6. PROJECT PLANNING & SCHEDULING

6.1 Technical Architecture

Table-1: Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	How user interacts with the web application	HTML, CSS, JavaScript, Python, Flask etc.
2.	Application Logic-1	Logic for a process in the application	JavaScript
3.	Database	Data Type, Configurations etc.	MySQL
4.	Dashboards and story	Bringing out insights from the data	Tableau

5.	Deployment	deploying the web app so that users can access it from their browsers	PythonAnywhere
6.	publishing dashboards	publishing the dashboards so that others can see	Tableau public

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Security Implementations	Dataset is being protected using user credentials on MySQL server	password verification
2.	Scalable Architecture	scaling the resources bases on demand	Cloud-based infrastructure
3.	Availability	High availability achieved through load balancers and distributed servers.	Load balancers, Distributed servers
4.	Performance	Designed for optimal performance, considering requests per second, cache usage, and CDN integration.	Load balancing, Caching mechanisms, CDN integration

References: **https://developer.ibm.com/patterns/online-order-processing-system-during-pandemic/ https://www.ibm.com/cloud/architecture https://aws.amazon.com/architecture https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d**

6.2 Sprint Planning & Estimation

6.2.1 User Story Identification:

- Identify Features: Break down the project requirements into user stories and features, such as data collection, dashboard creation, analysis features, and reporting.
- Prioritization: Prioritize user stories based on business value, complexity, and dependencies.

6.2.2 Sprint Backlog:

- Sprint Backlog Creation: Create a sprint backlog that includes user stories, tasks, and acceptance criteria for the upcoming sprint.
- Estimation: Estimate the effort required for each task using techniques like story points or hours.

6.2.3 Resource Allocation:

- Team Allocation: Assign team members to specific tasks based on their skills and expertise.
- Dependencies: Identify and manage dependencies between tasks to ensure smooth progress.

6.2.4 Sprint Review:

- Demo Preparation: Plan for a sprint review at the end of each sprint to demonstrate completed functionalities to stakeholders.
- Feedback Incorporation: Allocate time for feedback and potential adjustments to improve future sprints.

6.3 **Sprint Delivery Schedule**

6.3.1 Sprint Duration:

- Sprint Length: Define the duration of each sprint, balancing the need for frequent delivery with the capacity of the team.
- Number of Sprints: Estimate the total number of sprints required to complete the project.

6.3.2 Milestone Definition:

- Milestone Identification: Define key milestones for the project, such as the completion of data collection, dashboard development, and the final analysis.
- Release Planning: Plan for releases at the end of each sprint or at significant project milestones.

6.3.3 Sprint Review and Retrospective:

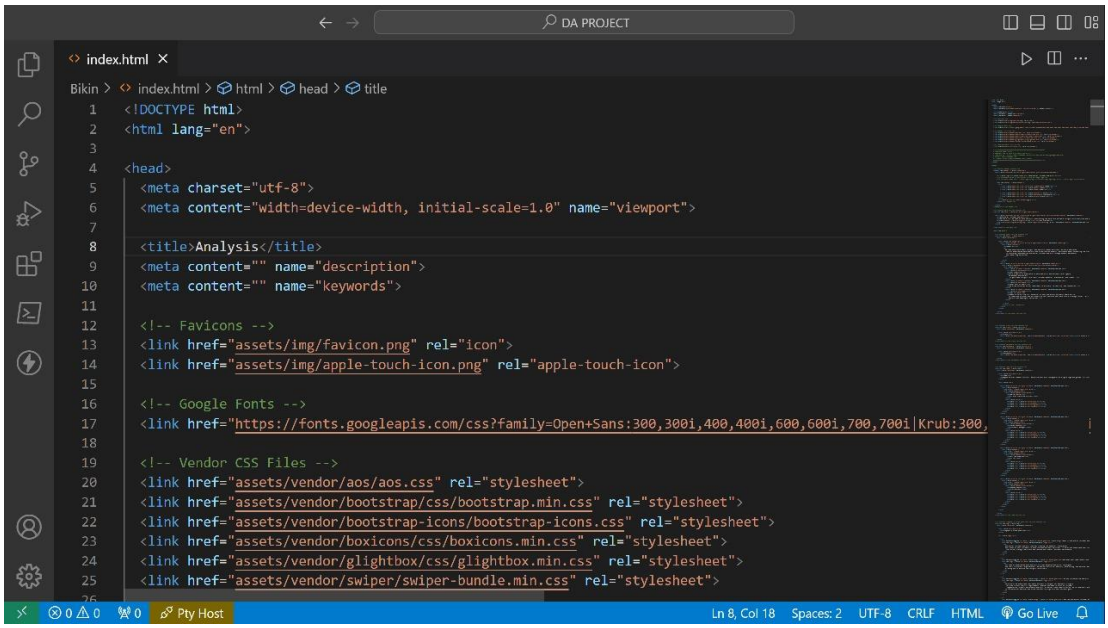
- Review Meetings: Schedule sprint review meetings to assess completed work and gather stakeholder feedback.
- Retrospective Meetings: Conduct retrospective meetings to reflect on the sprint process and identify areas for improvement.

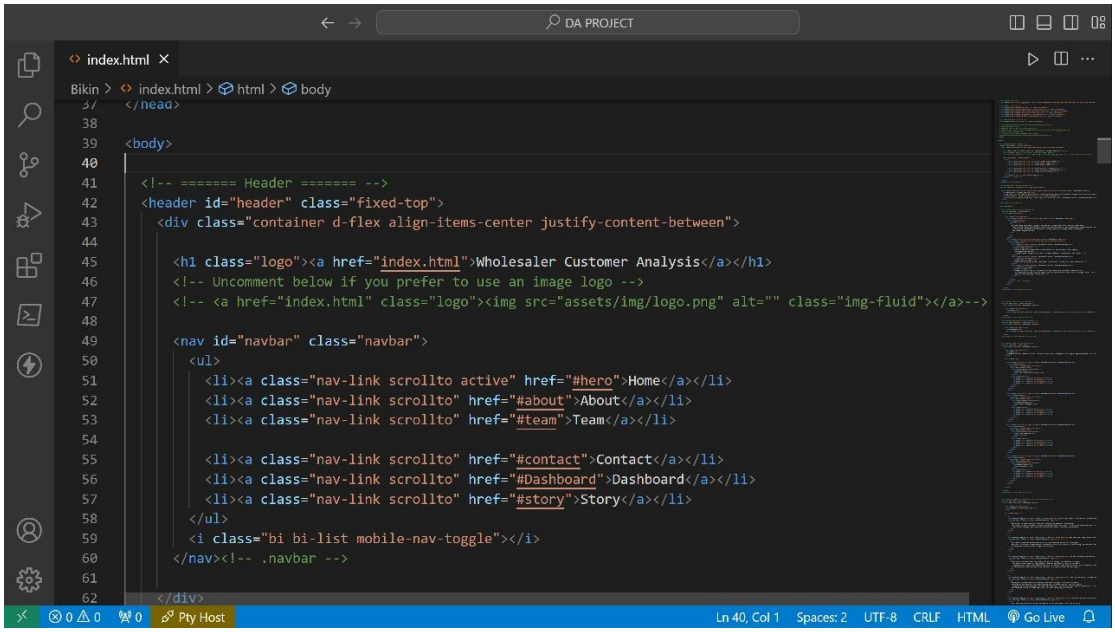
6.3.4 Adaptation and Adjustments:

- Adaptation to Feedback: Allow for flexibility in the schedule to incorporate feedback and make adjustments to the project plan.
- Continuous Improvement: Encourage a culture of continuous improvement, where lessons learned from each sprint contribute to refining future plans.

By implementing effective Sprint Planning & Estimation and Sprint Delivery Schedule practices, the project can progress in an organized and iterative manner, ensuring that stakeholder expectations are met, and valuable insights are delivered at the end of each sprint. Adjustments to the plan can be made as needed based on the feedback and evolving project requirements.

7. CODING & SOLUTIONING (Explain the features added in the project along with code)





7.1 Feature 1-Interactive dashboard

7.2 Database Schema (if Applicable)-My SQL

8. PERFORMANCE TESTING

8.1 Performance Metrics

1.Response Time:

- Objective: Ensure quick and responsive user interactions.
- Measurement: Average response time for key dashboard actions.

2.Concurrency:

- Objective: Assess the system's ability to handle simultaneous users.
- Measurement: Concurrent user count during peak usage.

3.Throughput:

- Objective: Evaluate the system's transaction processing capacity.
- Measurement: Transactions per second (TPS) during peak load.

4.Resource Utilization:

- Objective: Optimize server resource usage for efficiency.
- Measurements:
  Usage (%)
  Memory Usage (%)
  Disk I/O performance

5.Latency:

- Objective: Minimize delays in user interactions.
- Measurement: Average latency for critical dashboard actions.

6.Error Rates:

- Objective: Ensure a reliable user experience.
- Measurement: Percentage of requests resulting in errors.

7.Data Load Time:

- Objective: Optimize data retrieval and refresh times.
- Measurement: Time taken to load and refresh datasets.

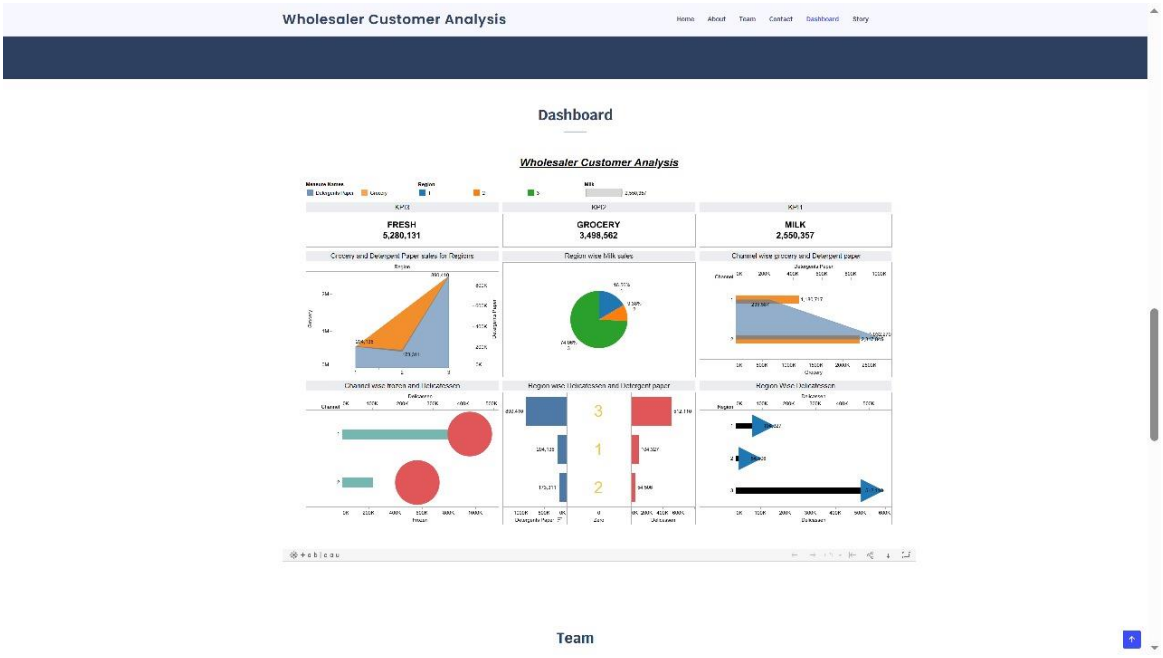
8.Dashboard Load Time:

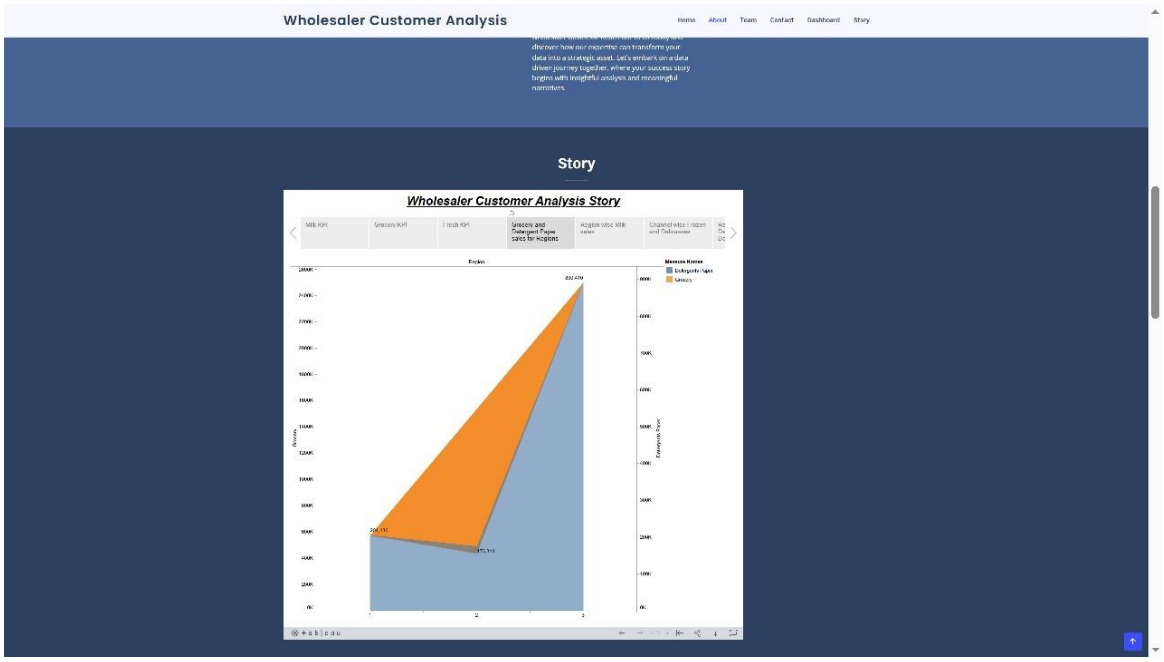
- Objective: Enhance overall user experience.
- Measurement: Time taken to load complete dashboards.

These performance metrics provide a comprehensive view of the Tableau data analytics project's efficiency and responsiveness. Continuous monitoring and optimization based on these metrics will ensure a seamless user experience and support future scalability.

9. RESULTS

9.1 Output Screenshots





10. **ADVANTAGES & DISADVANTAGES**

10.1 Advantages:

Data Visualization:

- Tableau's strong data visualization capabilities enable clear and intuitive representation of market insights, making it easier for stakeholders to understand complex data.

Interactivity:

- Interactive dashboards in Tableau allow users to explore and analyse data dynamically, fostering a more engaging and insightful user experience.

Predictive Analytics:

- The incorporation of predictive analytics in Tableau can provide valuable insights into future spending trends, helping businesses proactively identify growth opportunities.

User-Friendly Interface:

- Tableau's user-friendly interface facilitates easier adoption and reduces the learning curve for users, enabling a broader range of stakeholders to engage in data analysis.

10.2 Disadvantages:

Cost:

- Tableau may involve licensing costs, and depending on the scale of the project, these costs can be significant.

Learning Curve:

- While Tableau is user-friendly, mastering its advanced features may require training, and not all team members may be immediately proficient.

Performance with Large Datasets:

- Tableau's performance may be affected with large datasets, necessitating optimization strategies for efficient analysis.

Dependency on Data Quality:

- The success of Tableau analysis is highly dependent on the quality of the input data; inaccurate or incomplete data can lead to misleading insights.

11. CONCLUSION

In conclusion, leveraging Tableau for the project "Unveiling Market Insights" offers substantial benefits in terms of data visualization, interactivity, and predictive analytics. The user-friendly interface enhances accessibility, fostering a more collaborative and informed decision-making process. However, it's essential to be mindful of the associated costs, the learning curve for users, and the importance of maintaining high-quality data for accurate analysis.

12. FUTURE SCOPE

Looking ahead, there are several avenues for future development and enhancement of the project:

1.Integration with Advanced Analytics Tools:

- Explore integration with advanced analytics tools to enhance predictive modelling and machine learning capabilities for more accurate market insights.

2.Real-Time Data Analysis:

- Consider incorporating real-time data analysis features to enable businesses to react promptly to changing market dynamics.

3.Enhanced Security Measures:

- Strengthen data security measures to ensure compliance with evolving regulations and protect sensitive market information.

4.Mobile Compatibility:

- Develop mobile-compatible versions of the Tableau dashboards to provide on-the-go access to market insights for stakeholders.

5.Collaborative Features:

- Explore collaboration features within Tableau to facilitate teamwork and information sharing among project stakeholders.

By addressing these future considerations, the project can evolve to meet the growing demands of the market analysis landscape and provide even more valuable insights to businesses.

13. APPENDIX

Source Code:

https://drive.google.com/drive/folders/1Y34DlgGFx0QcNH0zzTY82KQ5urVx0eWC?usp=sharing

GitHub Link:

https://github.com/smartinternz02/SI-GuidedProject-587751-1697029415

Project Demo Link:

https://drive.google.com/file/d/1ucW40r7Yfa3XqG-TSvaCC_0fgV67aFTE/view?usp