

PROJECT REPORT

Team ID	LTVIP2025TMID51607
Project Name	Cosmetic Insights : Navigating Cosmetics Trends and Consumer Insights with Tableau

Index / Table of Contents

1. INTRODUCTION

1.1 Project Overview

1.2 Purpose

2. IDEATION PHASE

2.1 Problem Statement

2.2 Empathy Map Canvas

2.3 Brainstorming

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

3.2 Solution Requirement

3.3 Data Flow Diagram

3.4 Technology Stack

4. PROJECT DESIGN

4.1 Problem–Solution Fit

4.2 Proposed Solution

4.3 Solution Architecture

5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

6. FUNCTIONAL AND PERFORMANCE TESTING

6.1 Performance Testing

7. RESULTS

7.1 Output Screenshots

8. ADVANTAGES & DISADVANTAGES

9. CONCLUSION

10. FUTURE SCOPE

11. APPENDIX

- Source Code (if any)

- Dataset Link
- GitHub & Project Demo Link

1. 1. INTRODUCTION

1.1 Project Overview

The project titled "Cosmetic Insights: Navigating Cosmetics Trends and Consumer Insights with Tableau" focuses on analyzing cosmetic product data using Tableau to discover brand performance and skin suitability trends.

The project explores:

- Product pricing patterns
- Brand rankings
- Ingredient labels
- Suitability for different skin types

Using Tableau's visualization and story features, we deliver interactive dashboards for cosmetic industrial stakeholders.

1.2 Purpose

- Identify popular cosmetic brands based on rank and label
- Analyze price variations across brands
- Determine product suitability for various skin types (Sensitive, Dry, Normal, Oily)
- Enable consumers and analysts to make informed decisions through interactive visual dashboards

2. IDEATION PHASE

2.1 Problem Statement

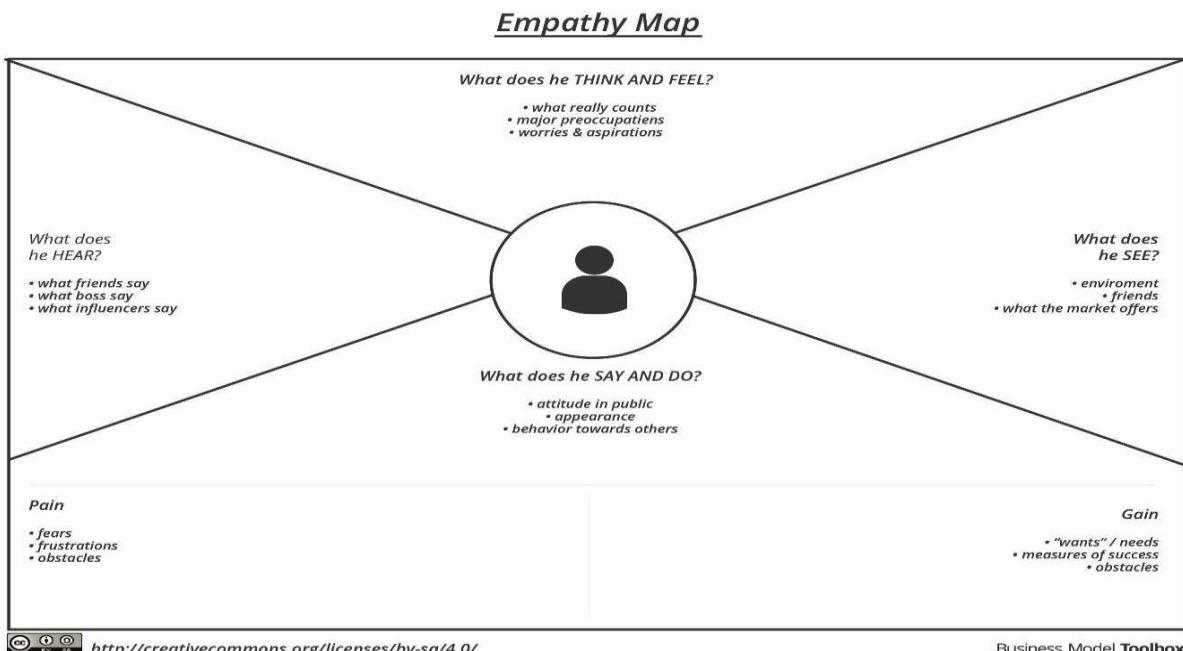
Cosmetic buyers often struggle to find products best suited for their skin type. Marketers lack insights into what ingredient labels and brand features customers prefer. There's a need for a solution that provides clear visual insights into product performance.

I am	Describe customer with 3-4 key characteristics - who are they?	Describe the customer and their attributes here
I'm trying to	List their outcome or "job" the care about - what are they trying to achieve?	List the thing they are trying to achieve here
but	Describe what problems or barriers stand in the way - what bothers them most?	Describe the problems or barriers that get in the way here
because	Enter the "root cause" of why the problem or barrier exists - what needs to be solved?	Describe the reason the problems or barriers exist
which makes me feel	Describe the emotions from the customer's point of view - how does it impact them emotionally?	Describe the emotions the result from experiencing the problems or barriers

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A brand analyst at a cosmetics company.	Understand how customer preferences vary across product categories and demographic	the data is large and difficult to interpret manually	I don't have an intuitive or visual way to analyze customer behavior and trends	frustrated and unable to provide useful marketing insights
PS-2	marketing strategist at a beauty brand.	identify which cosmetic products are trending in different regions	I don't have a visual tool that consolidates consumer preferences and sales data.	The data is scattered in raw spreadsheet s and lacks visual patterns	lost and unsure how to plan marketing campaigns effectively

2.2 Empathy Map Canvas

(Primary user = Real-estate analyst/ marketing executive)



Section

Content

Says

We need visual insights on which cosmetic products are trending.
I want to compare consumer preferences across age groups and regions.

Thinks	I'm not sure if our campaigns match what consumers actually want. There might be demand trends we're not tracking properly.
Does	Uses Excel reports or sales logs to track performance manually. Spends hours reviewing product sales and feedback in raw format.
Feels	Frustrated with data overload and lack of visual tools. Wants confidence when recommending marketing plans to leadership.
Sees	Messy sales reports, CSV files, and static charts. Disjointed insights without clear consumer trends.
Hears	Leadership asking for trend-based campaigns. Marketing heads pushing for data-backed decisions.
Pains	Manual effort with low visibility into preferences Hard to present compelling reports with plain data.
Gains	Interactive Tableau dashboards that highlight preferences and performance. Improved targeting and stronger marketing RO

2.3 Brainstorming & Idea prioritization

Step-1: Team Gathering, Collaboration and Select the Problem Statement

The image shows three vertical panels of a digital template. The first panel on the left is titled 'Brainstorm & idea prioritization' and includes a lightbulb icon. It says: 'Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.' Below it, it lists: '10 minutes to prepare', '1 hour to collaborate', and '2-8 people recommended'. The middle panel is titled 'Before you collaborate' and includes a circular icon with a person and a gear. It says: 'A little bit of preparation goes a long way with this session. Here's what you need to do to get going.' Below it, it lists: 'Team gathering', 'Set the goal', and 'Learn how to use the facilitation tools'. The third panel on the right is titled 'Define your problem statement' and includes a circular icon with a question mark. It says: 'What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.' Below it, it lists: 'Key rules of brainstorming' with items like 'Stay in topic.', 'Defer judgment.', 'Go for volume.', 'Encourage wild ideas.', 'Listen to others.', and 'If possible, be visual.'

Step-2: Brainstorm, Idea Listing and Grouping

Raw Ideas:

- Track most trending cosmetic products by category
- Show consumer preferences by age/gender/location
- Visualize product performance over time
- Compare sales by brand or product type
- Use pie charts for market share by brand
- Use bar graphs for ratings by category
- Dashboard with filters for product type and timeframe
- Explore the correlation between reviews and sales

Grouped into Categories:

1. Product Characteristics

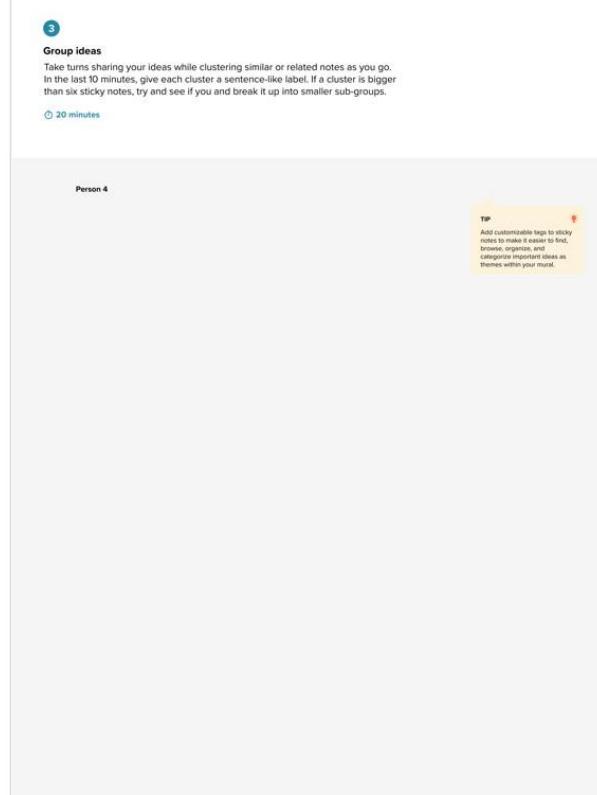
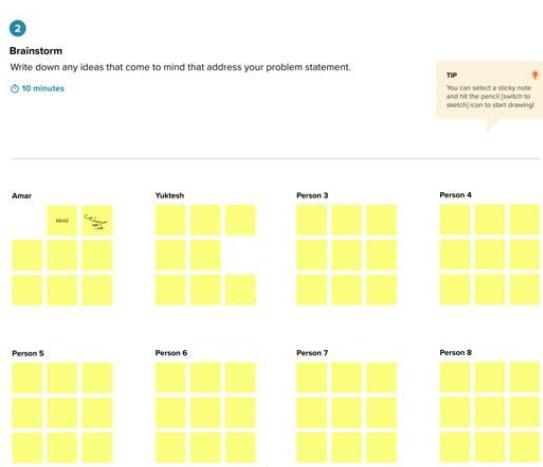
- Product type (lipstick, foundation, etc.)
- Brand comparison
- Rating and reviews

2. Visualization Methods:

- Pie chart for market share
- Line chart for trends over time
- Bar chart for product ratings
- Dashboard with filters

3. Business Insights

- Which product types are most in demand
- Consumer preference trends over time - Brand performance comparison



Step-3: Idea Prioritization

We used a simple prioritization method based on two criteria:

- Value to stakeholders (marketing team, analysts, product developers)
- Feasibility in Tableau

Top Prioritized Ideas:

1. Dashboard visualizing product sales by category and brand
2. Consumer preference filters (age, gender, location)
3. Line chart showing product trends over time
4. Market share pie chart by brand

5. Ratings vs. sales correlation analysis

These ideas offer high-value business insights through effective and feasible visualizations using Tableau.

3. REQUIREMENT ANALYSIS

3.1 Customer Journey Map

1. User browses dataset of cosmetic products
2. Filters products based on brand, price, or skin suitability
3. Views dashboards to compare rank, label, and price
4. Makes informed product or marketing decisions

3.2 Solution Requirements

Functional Requirements:

Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Upload	Upload cosmetics dataset in CSV format
FR-2	Data Preprocessing	Clean null/missing values, standardize formats, categorize relevant variables
FR-3	Visualization	Design interactive Tableau dashboards showcasing trends, sales, consumer habits
FR-4	Filtering & Interactivity	Enable filters for year, brand, product type, skin type, etc.
FR-5	Dashboard Sharing	Publish dashboards to Tableau Public, generate and manage shareable links
FR-6	Report Generation	Export visual insights and key summaries as high-quality PDF reports

Non-functional Requirements:

Following are the non-functional requirements of the proposed solution.

FR No.	Non-Functional Requirement	Description
NFR-1	Usability	Dashboards must be easy to navigate and interpret for all stakeholders
NFR-2	Security	Secure Tableau links and anonymized dataset to protect user data
NFR-3	Reliability	Dashboards should load correctly without data loss or rendering issues
NFR-4	Performance	Dashboards should load in under 5 seconds for optimal user experience
NFR-5	Availability	Dashboards must be accessible online 24/7 on Tableau Public
NFR-6	Scalability	System should support future datasets with more years or cosmetic categories

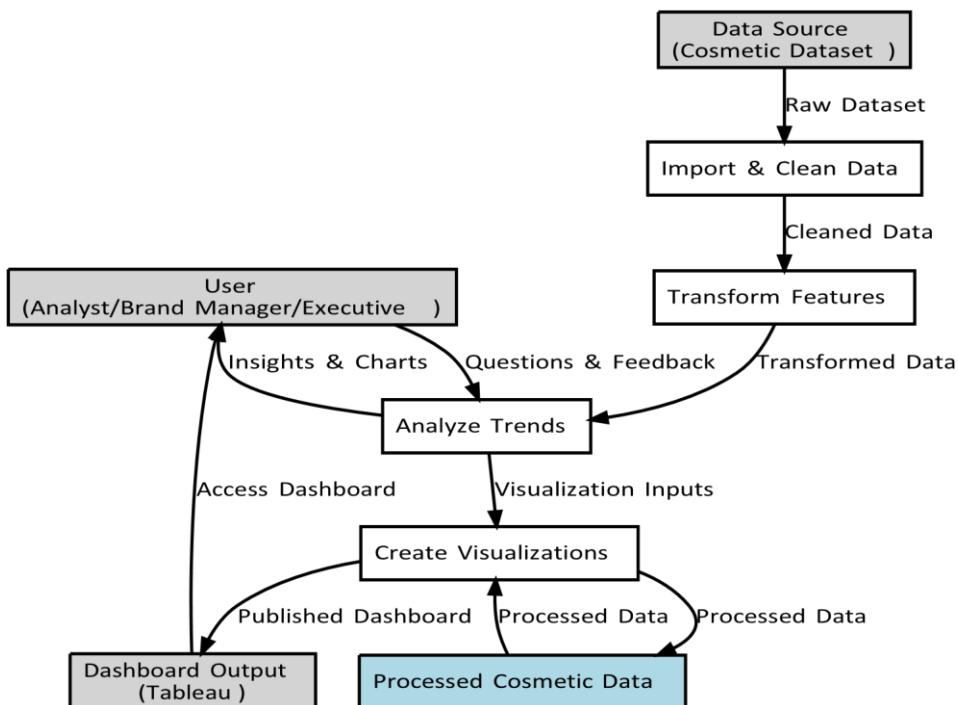
3.3 Data Flow Diagram

1. Dataset input (CSV format)
2. Preprocessing: Cleaning, calculated fields, binning
3. Visualizations: Price vs Brand, Suitability charts, Rank analysis
4. Dashboards created and published via Tableau Public
5. Users interact with visuals via filters and story views

Flow Summary:

1. Raw cosmetic dataset is imported into Tableau.
2. Columns like product sales, consumer demographics, ingredient lists, and review sentiment are processed.
3. Multiple visualizations (bar charts, line graphs for trends, pie charts for market share, treemaps for product categories) are created.
4. Dashboards are compiled and published to Tableau Public.
5. Users access dashboards for strategic decisions regarding product launches, marketing campaigns, and inventory management.

Example : DFD Level 0(Industry Standard)



Example : Flow



User Stories

User stories Table (For Tableau Dashboard Project):

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria

Analyst (Dashboard User)	View Sales & Product Performance	USN-1	As an analyst, I want to view overall sales by product category and region so I can understand top performers.	I can see KPIs like total sales, average price per unit, and sales by product category in a single overview dashboard.
Analyst (Dashboard User)	Analyze Consumer Behavior	USN-2	As an analyst, I want to compare sales based on consumer demographics (age, gender) to understand target audiences.	I can view bar charts showing sales distribution across different age groups and genders.
Marketing Manager	Understand Trend Impact	USN-3	As a marketing manager, I want to visualize emerging beauty trends (e.g., clean beauty, specific ingredients) to tailor campaigns.	I can use a trend line chart to see the growth or decline of specific cosmetic trends over time.
Product Development (Dashboard User)	Explore Product Features & Ingredients	USN-4	As a product developer, I want to explore product sales grouped by key ingredients or benefits (e.g., hydrating, anti-aging).	I can view a grouped chart showing sales by ingredient type and product benefit.
Sales Executive	Identify Regional Opportunities	USN-5	As a sales executive, I want to visualize sales distribution by geographic region to identify high-growth areas.	I can see a map visualization showing performance per region/city.
Admin (Dashboard Publisher)	Public Dashboard	USN-6	As an admin, I want to upload dashboards to Tableau Public for stakeholder access.	I can publish the work and share the Tableau Public link.
User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria
Analyst (Dashboard User)	Filter Data	USN-7	As an analyst, I want to filter dashboards by time period (e.g., quarter, year) or specific product lines.	I can use filter controls to dynamically adjust visualizations.
Executive	Export Visual Reports	USN-8	As an executive, I want to download and share charts with my team for presentations.	I can export visuals as images or PDFs from Tableau.

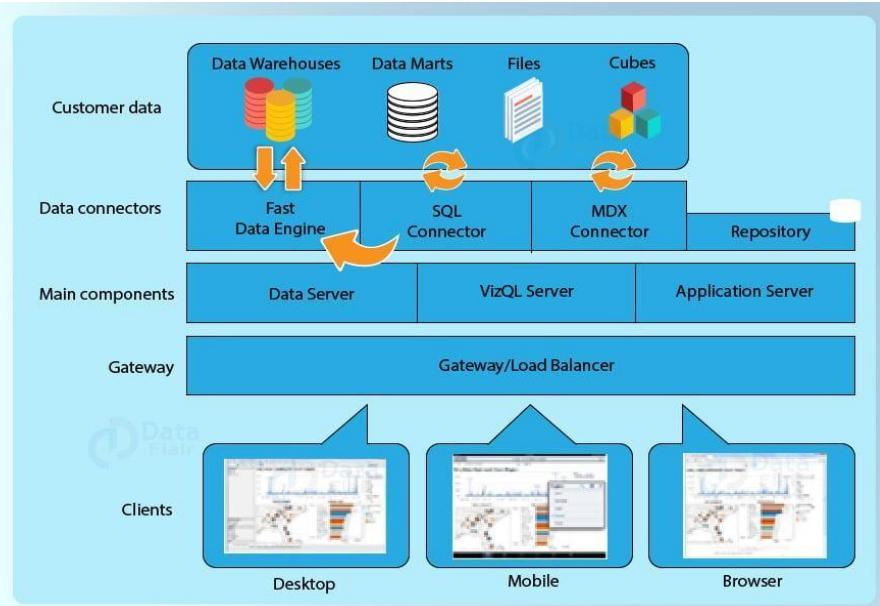
3.4 Technology Stack

- Tool: Tableau Desktop, Tableau Public
- Data Preprocessing: Excel
- Data Format: CSV
- Reporting: PDF export, screenshots

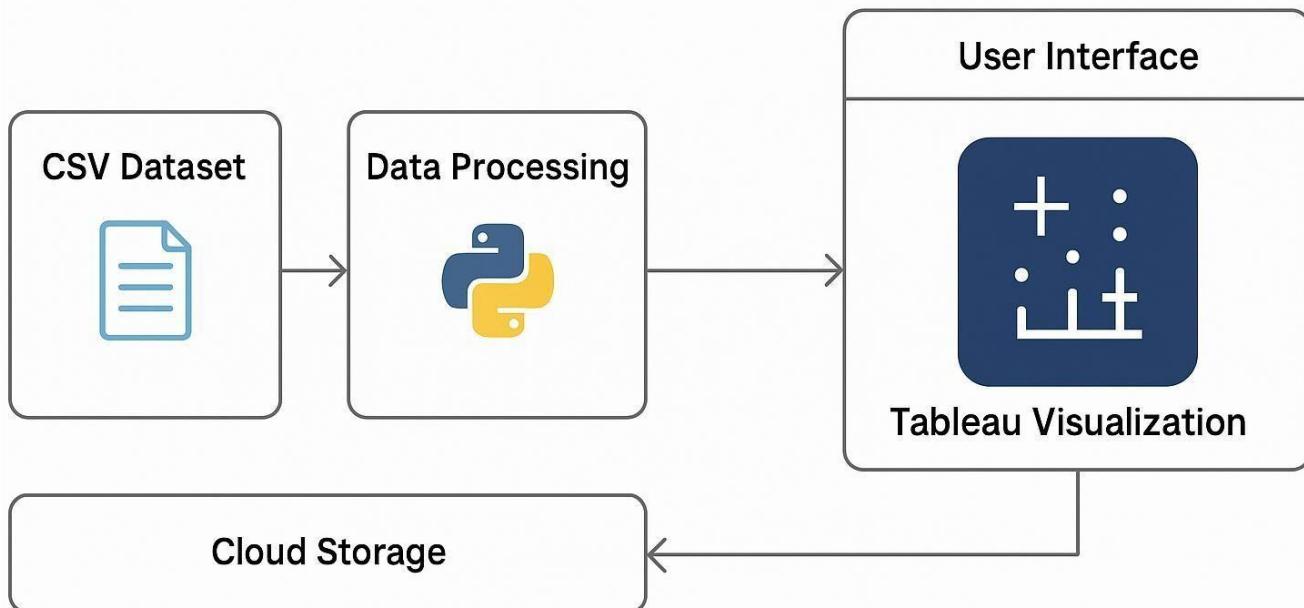
Technical architecture Overview:



Tableau Architecture



Technical Architecture



Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Python (Public)
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	SHA-256for IAM
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	3 -Tier Arch (UI)

4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Tableau PU
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's etc.)	Local cache Tableau

4. PROJECT DESIGN

4.1 Problem-Solution Fit

Consumers need clear insights on brand suitability. Our Tableau dashboards offer visual comparisons by brand, label, and skin suitability. The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns and recognize what would work and why **Purpose**:

- Solve complex problems in a way that fits the state of your customers.
- Succeed faster and increase your solution adoption by tapping into existing mediums and channels of behavior.
- Sharpen your communication and marketing strategy with the right triggers and messaging.
- Increase touch-points with your company by finding the right problem-behavior fit and building trust by solving frequent annoyances, or urgent or costly problems.
- Understand the existing situation in order to improve it for your target group.**

Template:

<p>Define CS, fit into CC</p> <p>Focus on J&P, tie into BE, understand RC</p> <p>Identify strong TR & EM</p>	<p>1. CUSTOMER SEGMENT(S) Who is your customer? I.e. working parents of 0-5 y.o. kids</p> <p>2. JOBS-TO-BE-DONE / PROBLEMS Which jobs-to-be-done (or problems) do you address for your customers? There could be more than one; explore different sides.</p> <p>3. TRIGGERS What triggers customers to act? I.e. seeing their neighbour installing solar panels; reading about a more efficient solution in the news;</p> <p>4. EMOTIONS: BEFORE / AFTER How do customers feel before they face a problem or a job and afterwards? I.e. lost, insecure > confident; In control - use it in your communication strategy & design.</p>	<p>CS</p> <p>6. CUSTOMER CONSTRAINTS What constraints prevent your customers from taking action or limit their choice of solutions? I.e. spending power, budget, no cash, network connection, available devices.</p> <p>J&P</p> <p>9. PROBLEM ROOT CAUSE What is the real reason that this problem exists? What is the back story behind the need to do this job? I.e. customers have to do it because of the change in regulations.</p> <p>TR</p> <p>EM</p> <p>SL</p>	<p>CC</p> <p>AS Explore AS, differentiate</p> <p>RC</p> <p>BE Focus on J&P, tie into BE, understand RC</p> <p>CH Extract online & offline CH of BE</p> <p>8.1 ONLINE What kind of actions do customers take online? Extract online channels from #7</p> <p>8.2 OFFLINE What kind of actions do customers take offline? Extract offline channels from #7 and use them for customer development.</p>
		5. AVAILABLE SOLUTIONS Which solutions are available to the customers when they face the problem or need to get the job done? What have they seen in the past? What pros & cons do these solutions have? I.e. solar panel installers, calculate usage and benefits; indirectly associated: customers spend free time on volunteering work (I.e. Greenpeace)	

Category	Description
Customer Segment	Cosmetic brand managers, product developers, marketing teams, trend analysts.
Key Problem(s)	Difficulty understanding fast-changing cosmetic trends, consumer preferences, and feedback across categories.

Why it's a problem	Leads to poor product launches, missed trends, weak marketing campaigns, and low customer satisfaction.
Existing Alternatives	Manual analysis of reviews, Excel-based reports, time-consuming surveys, inconsistent competitor research.
Your Solution	Tableau dashboards that visualize cosmetic product trends, sentiment analysis, category ratings, and price-performance comparisons.
Main Benefit	Clear, visual, and actionable insights to identify emerging trends, understand customer needs, and improve data-driven marketing and development.
Success Criteria	Better product-market fit, faster trend identification, enhanced customer engagement, and informed strategic decisions.

References:

1. <https://www.ideahackers.network/problem-solution-fit-canvas/>
2. <https://medium.com/@epicantus/problem-solution-fit-canvas-aa3dd59cb4>

4.2 Proposed Solution

- Import cosmetic dataset
- Clean nulls, create bins and calculated fields
- Create dashboards for brand, label, price, and suitability
- Build a Tableau Story with filters and captions
- Share dashboard via Tableau Public

S.No.	Parameter	Description
1	Problem Statement	Cosmetic brands struggle to understand fastchanging trends, consumer preferences, and sentiments. This leads to missed opportunities, poor marketing, and low customer satisfaction.

2	Idea / Solution Description	We created a Tableau dashboard that visualizes product trends, category performance, consumer reviews, and pricing patterns. It helps brands quickly understand what products and features are most appreciated.
3	Novelty / Uniqueness	The dashboard combines product ratings, review sentiment, and trend insights in one place. It's simple to use and helps teams make data-driven decisions faster.
4	Social Impact / Customer Satisfaction	Helps cosmetic brands deliver more relevant, consumer-friendly products. Enhances customer satisfaction by responding to real feedback and trends.
5	Business Model	The dashboard can be offered as an internal analytics tool for cosmetic companies or as a market research service for external clients.
6	Scalability of the Solution	The solution can be expanded to analyze new product categories, competitor data, or global trends by integrating more data sources into Tableau.

4.3 Solution Architecture

- Input: Cosmetic CSV file
- Processing: Excel + Tableau Desktop
- Visualization: Dashboards + Story
- Output: Tableau Public link for exploration

5. PROJECT PLANNING & SCHEDULING

Product Backlog, Sprint Schedule, and Estimation

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points
Sprint-1	Data Preparation	USN-1	Upload cosmetics dataset in CSV format	3
Sprint-1	Data Cleaning	USN-2	Clean and preprocess data (handle nulls, rename columns, filter dates)	4
Sprint-1	Initial Visualizations	USN-3	Create bar, pie, and donut charts for brand and category trends	5
Sprint-2	Filter Integration	USN-4	Add filters (product type, age group, location) in dashboard	4
Sprint-2	Story Creation	USN-5	Build Tableau story with scenes, titles, and captions	5
Sprint-2	Dashboard Publishing	USN-6	Publish dashboard to Tableau Public and generate access link	3
Sprint-3	Performance Testing	USN-7	Test dashboard loading and filter responsiveness	4
Sprint-3	Screenshot and Documentation	USN-8	Capture dashboard screenshots and write final insights report	4
Sprint-3	GitHub Folder Setup	USN-9	Organize files and submit using required folder structure	4
Sprint-4	Final Review	USN-10	Review and validate all content before submission	6
Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points
Sprint-4	Video Demo	USN-11	Record Walkthrough demo of the dashboard and upload	6

Project Tracker, Velocity & Burndown Chart: (4 Marks)

Sprint	Total Story Points	Duration	Sprint Start Date	Sprint End Date (Planned)	Story Points Completed (as on Planned End Date)
Sprint-1	12 sp	6 Days	24 June 2025	25 June 2025	12 sp
Sprint-2	12 sp	6 Days	26 June 2025	4 July 2025	12 sp
Sprint-3	12 sp	6 Days	02 July 2025	7 July 2025	-
Sprint-4	12 sp	6 Days	8 July 2025	13 July 2025	-

Velocity:

Imagine we have a 10-day sprint duration, and the velocity of the team is 20 (points per sprint). Let's calculate the team's average velocity (AV) per iteration unit (story points per day)

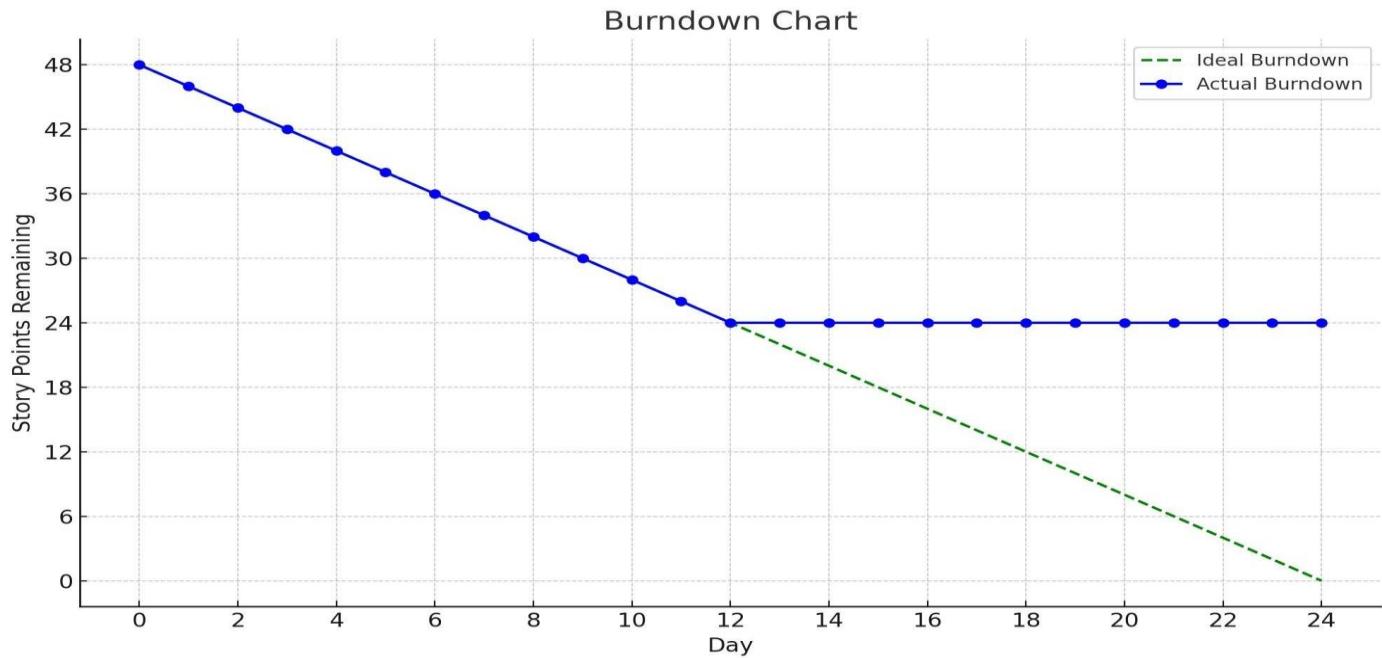
$$AV = \frac{\text{sprint duration}}{\text{velocity}} = \frac{20}{10} = 2$$

Average Velocity Calculation :

- Av = Total Completed Story points + Number of Days
- AV=24 sp / 12 days = 2 sp /day

Burndown Chart:

A burn down chart is a graphical representation of work left to do versus time. It is often used in agile software development methodologies such as Scrum.

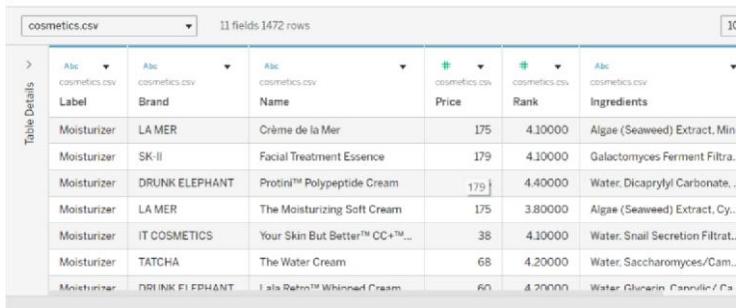
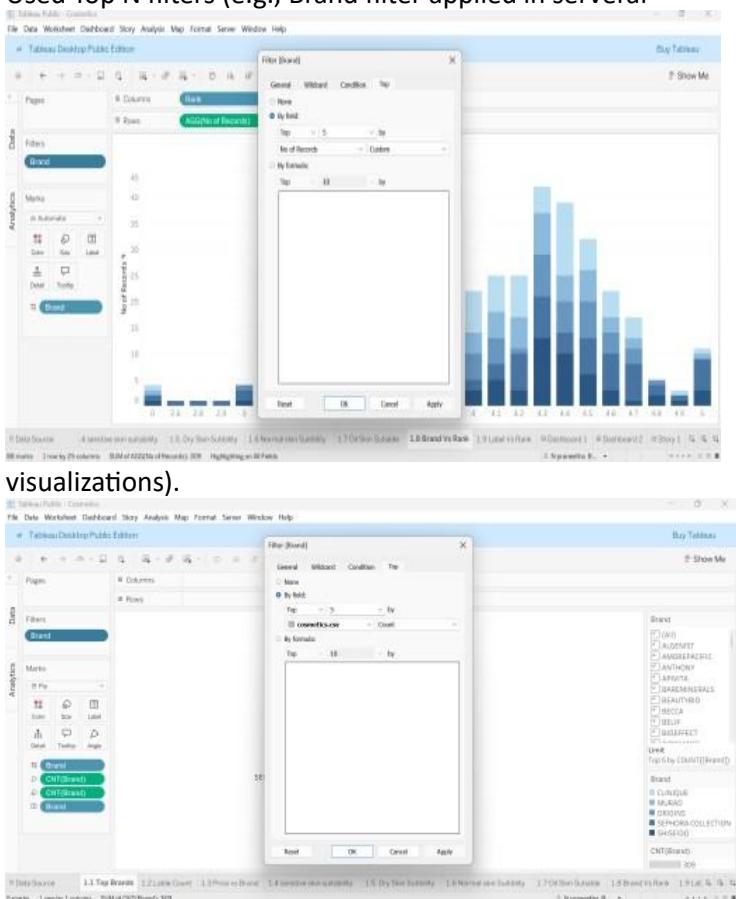


6. FUNCTIONAL AND PERFORMANCE TESTING

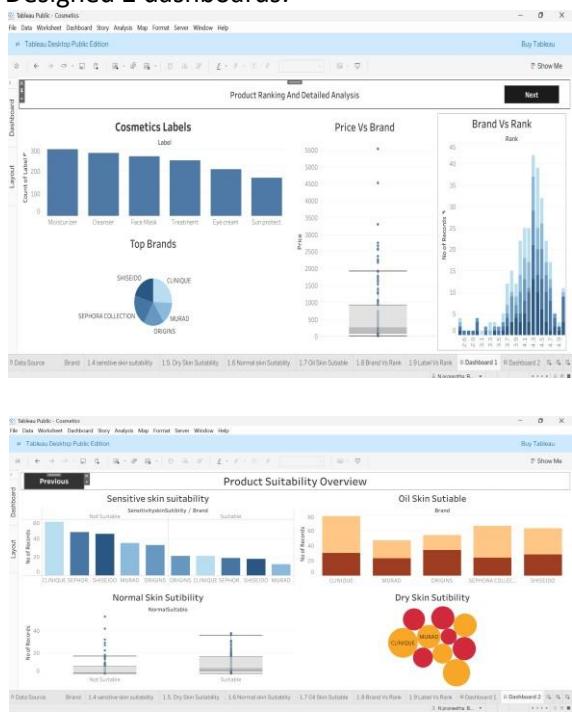
6.1 Model Performance Testing:

Project team shall fill the following information in model performance testing template.

S.No.	Parameter	Screenshot / Values
1.	Data Rendered	<p>Full dataset with 11 fields and 1472 rows from Cosmetics.csv</p>

2.	Data Preprocessing	 <p>Handled missing values, converted types , created bins</p>
3.	Utilization of Filters	<p>Used Top N filters (e.g., Brand filter applied in several visualizations).</p> 

4.	Calculation fields Used	<ul style="list-style-type: none"> Created Price Range Bins Calculated Average Rank Used IF conditions for skin suitability grouping
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5.	Dashboard design	<p>No of Visualizations :9</p> <ol style="list-style-type: none"> 1.Top Brands 2. Label Count 3. Price vs Brand 4. Sensitive Skin Suitability 5. Dry Skin Suitability 6. Normal Skin Suitability 7. Oil Skin Suitability 8. Brand vs Rank 9. Label vs Rank <p>Designed 2 dashboards:</p>  <p>Link: https://public.tableau.com/views/Cosmetics_17513898243280/Dashboard1?:language=en-US&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link</p>
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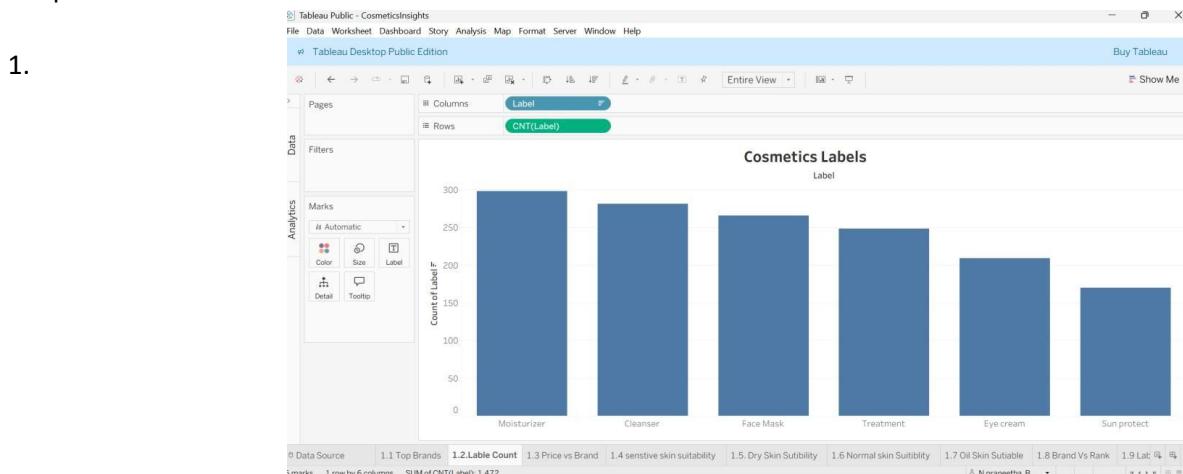
6	Story Design	<p>Story Title: Understanding Product Suitability and Brand Performance</p> <p>Slides Included:</p> <ol style="list-style-type: none"> 1. Top Brands – Pie chart showing top 5 brands by product count 2. Different of Labels – Label-wise distribution 3. Price of Different – Price comparison across brands 4. Skin Suitability – Visuals for Sensitive, Dry, Normal, and Oily skin 5. Brand Ranking – Rank comparison by brand 6. Label Ranking – Rank vs Label visualization <p>Features:</p> <ul style="list-style-type: none"> • Filtered using Brand and Category • Each slide has interactive controls • Captions provided for clarity  <p>Link:</p> <p>https://public.tableau.com/views/Cosmetics_17513898243280/Story1?:language=en-US&publish=yes&:sid=&:redirect=auth&:&display_count=n&:origin=viz_share_link</p>
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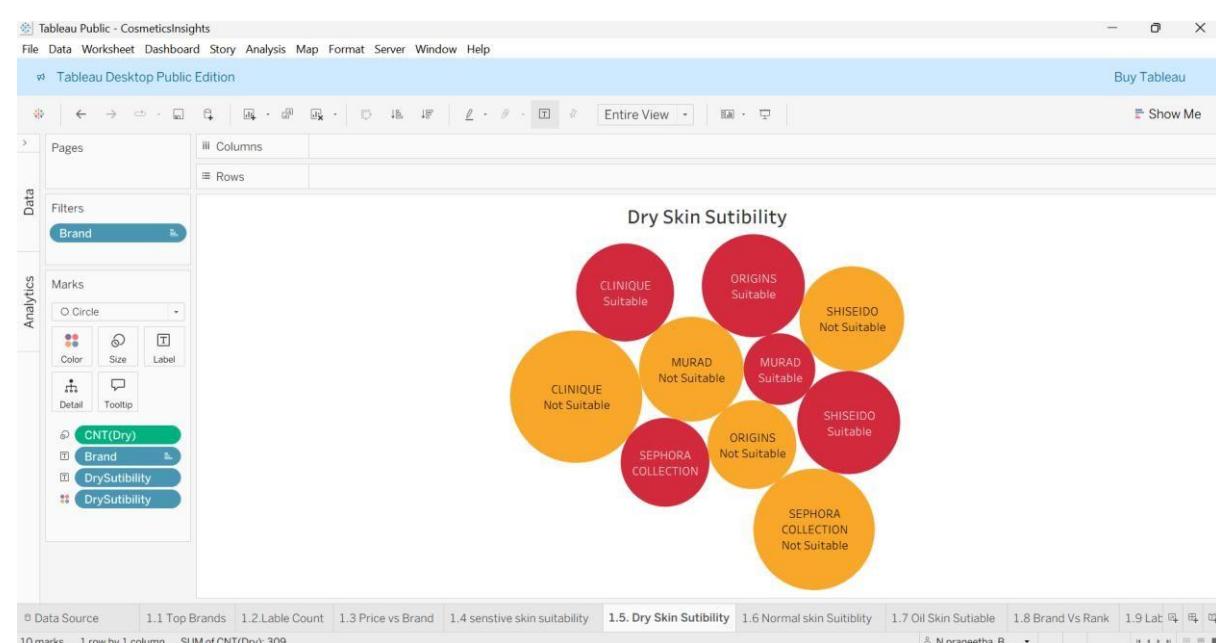
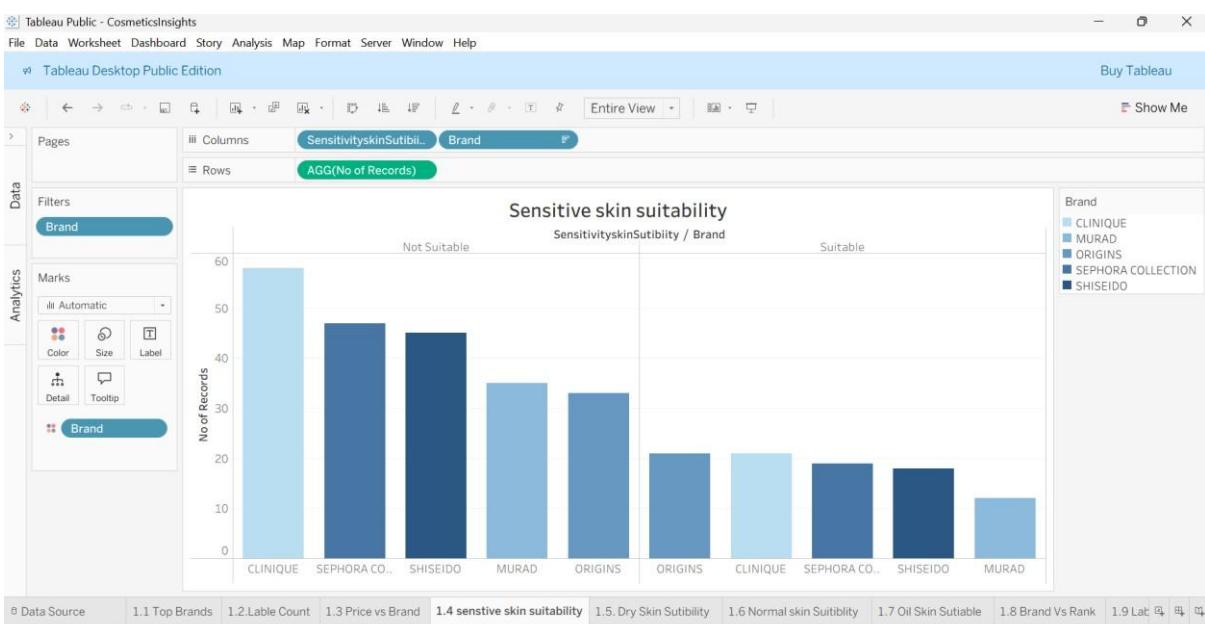
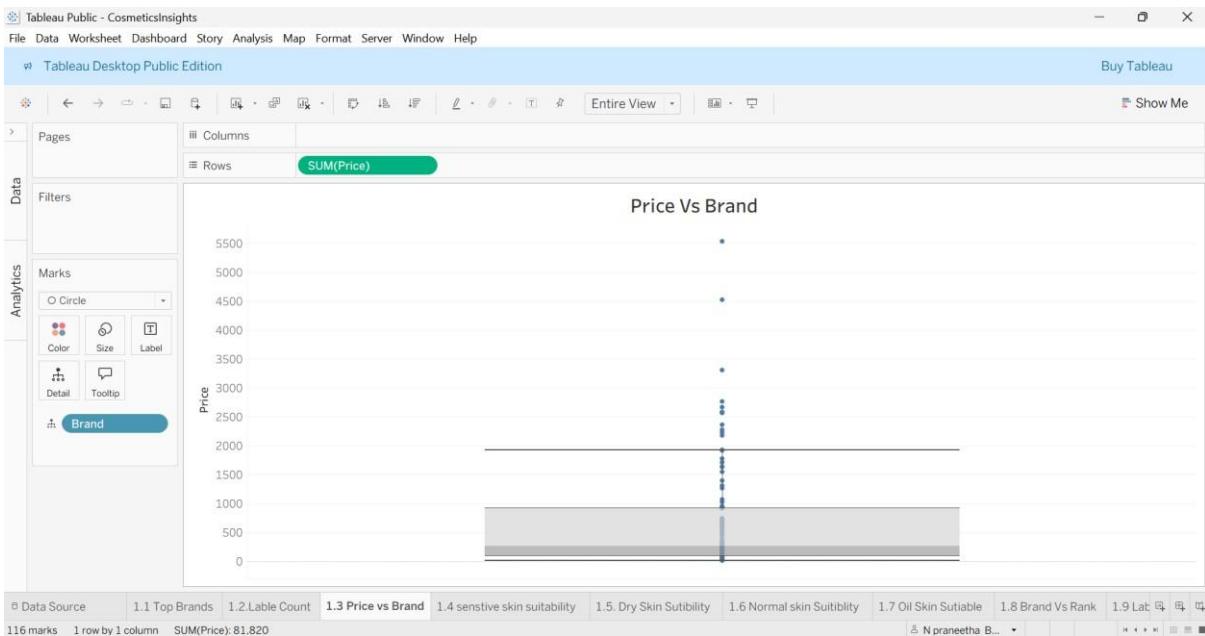
7. RESULTS

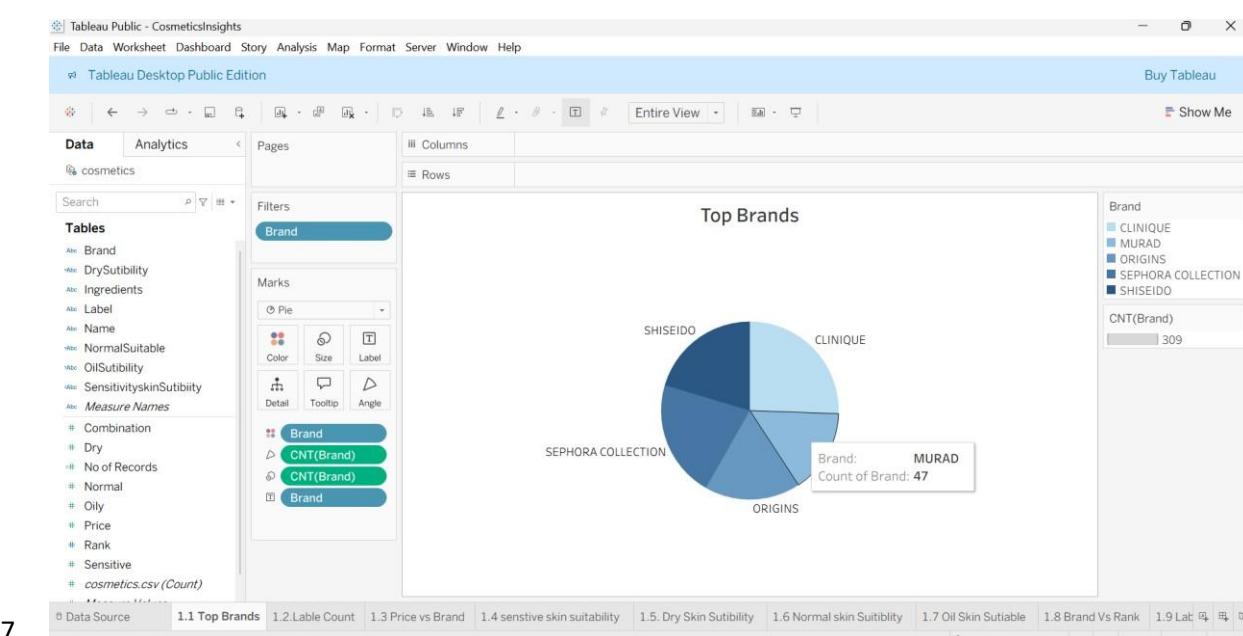
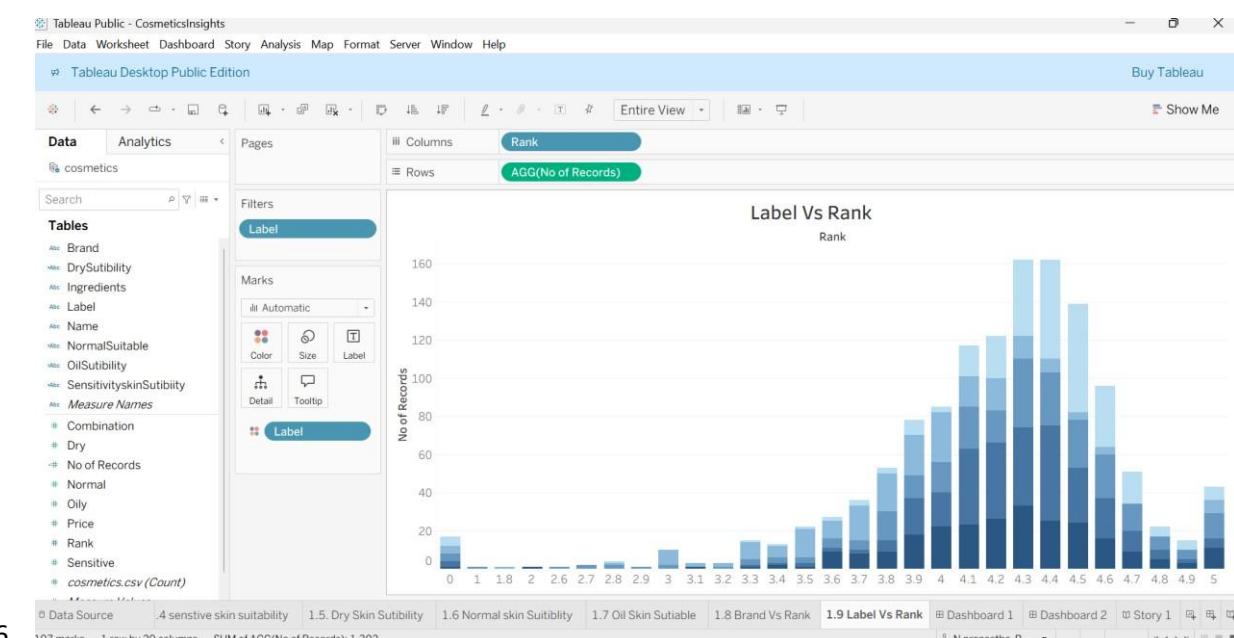
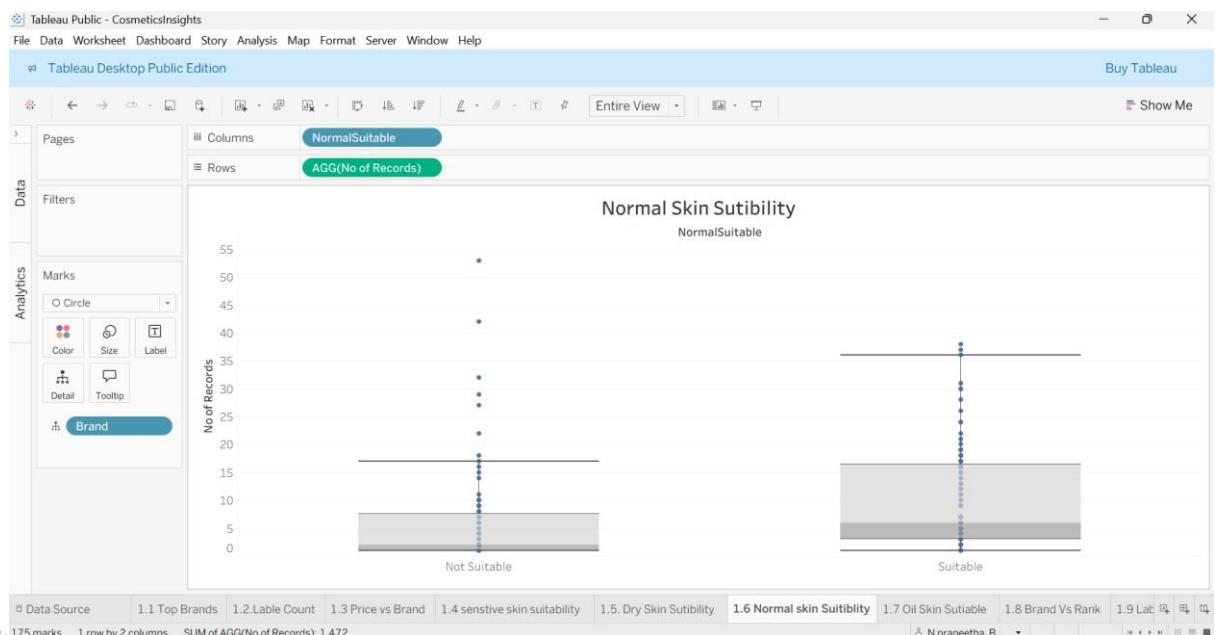
The Tableau story created delivers:

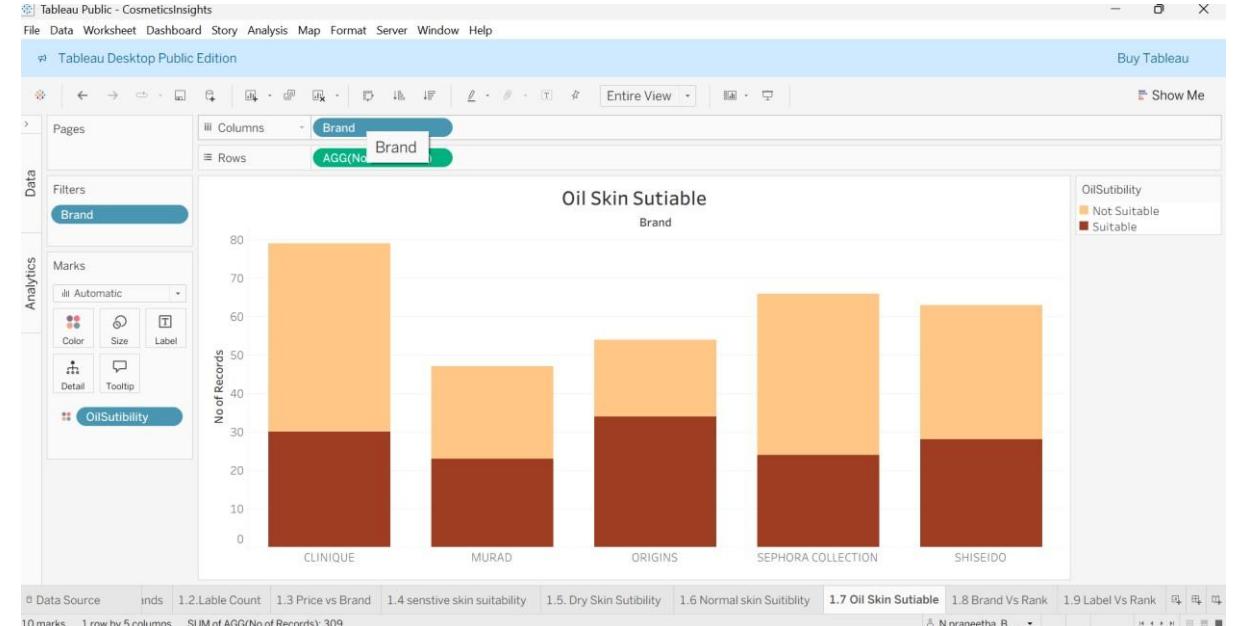
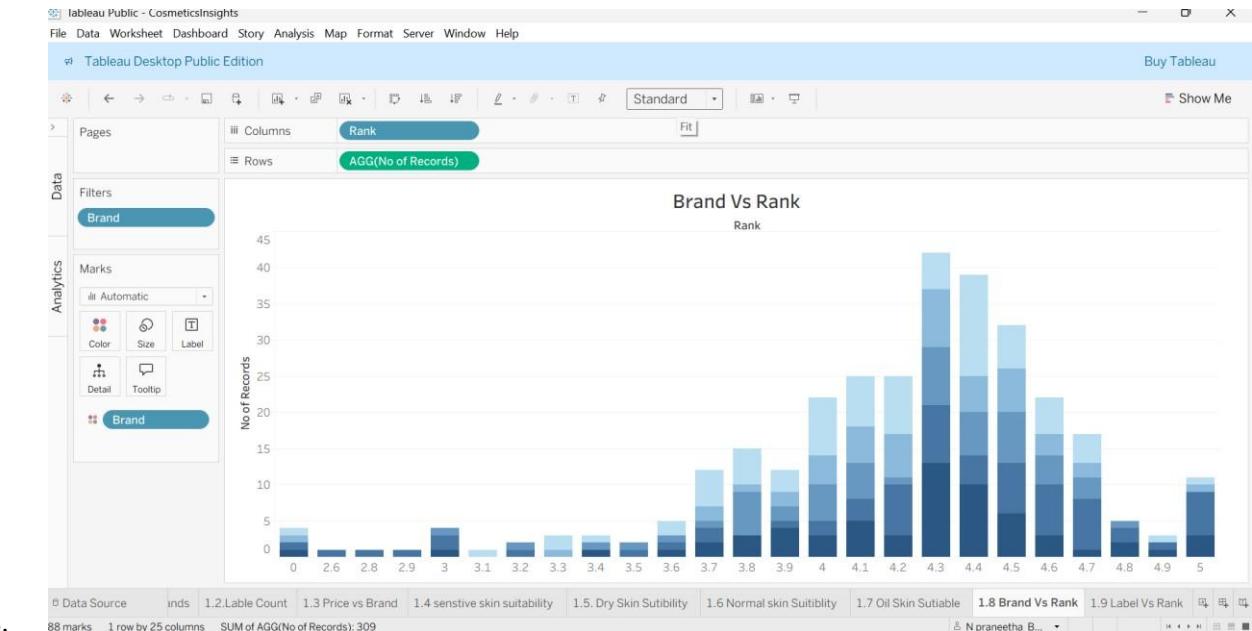
- A clear comparison of top brands by price and rank
- Ingredient label distribution
- Product suitability insights per skin type
- Story-based visual walkthrough with filters

Output Visuals:





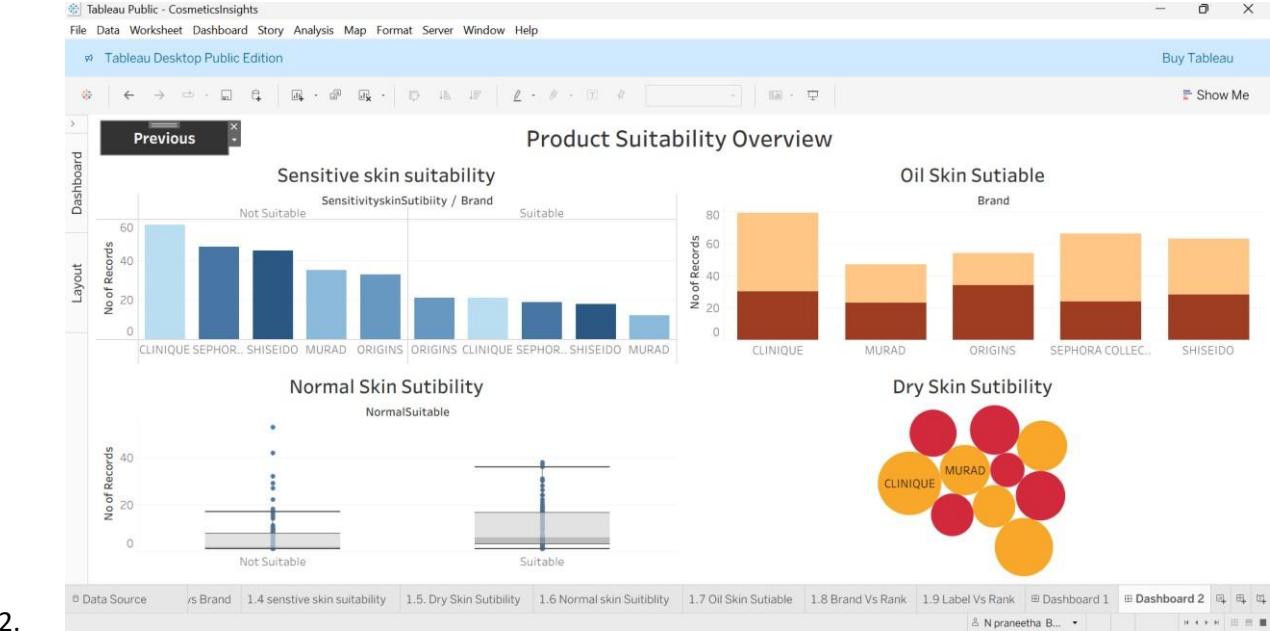
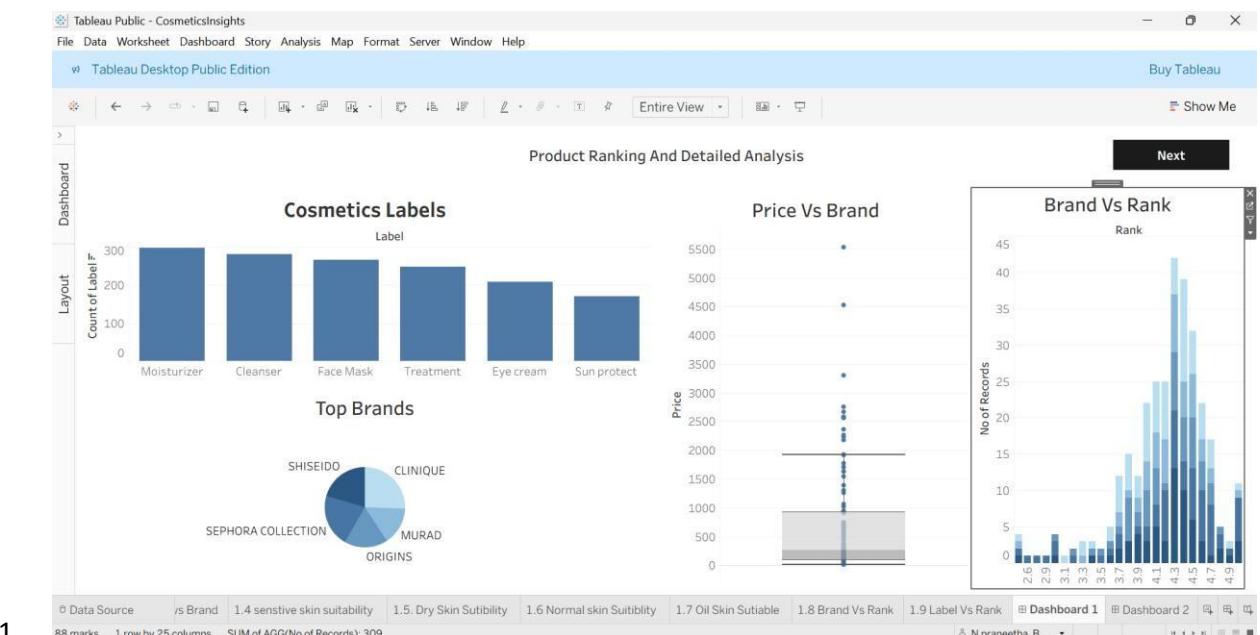




10. Final Dashboard Views:

Filename: Dashboard.png

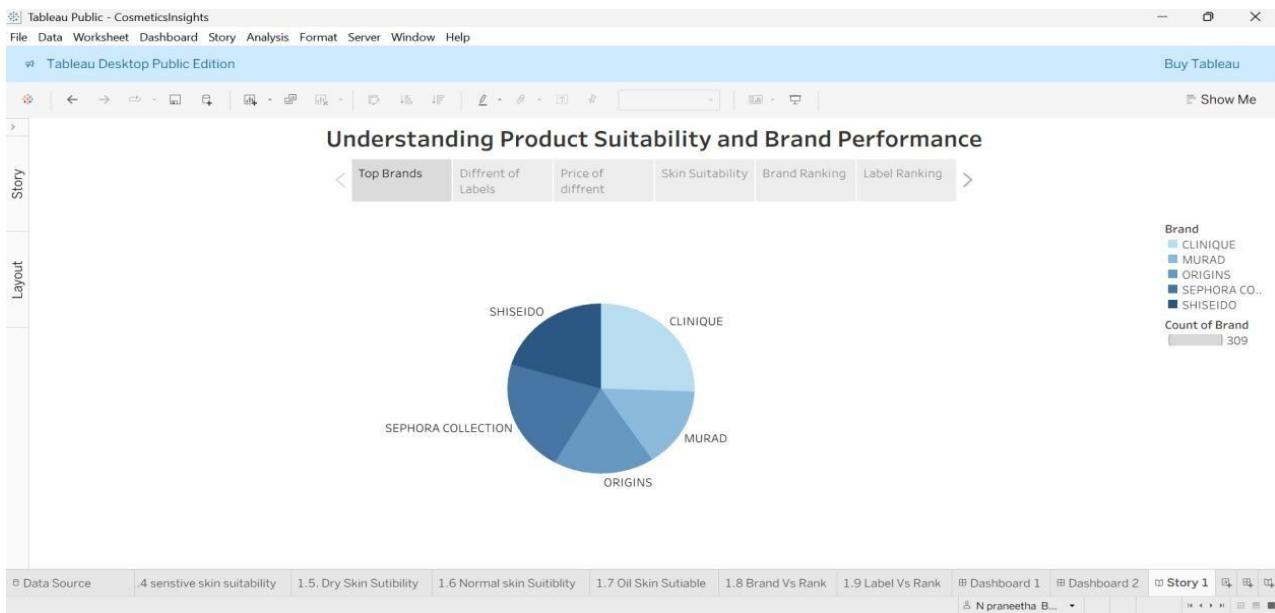
Caption : This interactive Tableau dashboard compiles all the above visualizations, complete with filters tooltips for user interaction.



11.Tableau Story Screen:

Filename: Story.png

Caption: The Story view walks users through each visualization in a narrative format with titles and captions, ideal for stakeholder presentation.



Note : Screenshots are stored in the folders:

- 6.Project Executable files/Dashboard.png
- 6. Project Executable files/Story.png

Link:

https://public.tableau.com/views/Cosmetics_17513898243280/Dashboard1?:language=en-US&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

Link:

https://public.tableau.com/views/Cosmetics_17513898243280/Story1?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

8. ADVANTAGES & DISADVANTAGES

Advantages:

- Interactive dashboard with multiple filters
- Skin-type based product recommendations
- Useful for both customers and marketers

Disadvantages:

- Dataset is static, doesn't auto-refresh
- No predictive analytics

9. CONCLUSION

The Cosmetic Insights project uses Tableau to reveal product trends and customer preferences. Visualizations help users explore top-performing brands and product suitability based on their skin type. It offers a reliable, interactive visual experience for consumers and businesses alike.

10. FUTURE SCOPE

- Integrate real-time product review data
- Add predictive insights (e.g., sentiment or pricing trend)
- Extend dataset with more brand categories
- Enable dynamic dataset uploads for future users

11. APPENDIX

- ✓ Dataset Link:

Source: Cosmetics Dataset

- <https://www.kaggle.com/datasets/kingabzpro/cosmetics-datasets>

- ✓ Tableau Dashboard Link:

Dashboard (interactive)

- https://public.tableau.com/views/Cosmetics_17513898243280/Dashboard1?:language=en-US&:sid=&:display_count=n&:origin=viz_share_link

- ✓ Tableau Story Link:

Story View with Scenes and Captions

- https://public.tableau.com/views/Cosmetics_17513898243280/Story1?:language=en-US&publish=yes&:sid=&:redirect=auth&:display_count=n&:origin=viz_share_link

- ✓ Project Demo Link:

Original Link

- <http://drive.google.com/file/d/19FGhCdImYFvIV19ZIpFQFmhWFraUjZcY/view>

- ✓ GitHub : [<https://github.com/praneetha2506/Cosmetic-Insights-Navigating-Cosmetics-Trends-and-Consumer-Insights-with-Tableau.git>]