

# Project Report

## Cosmetic Insights : Navigating Cosmetics Trends and Consumer Insights with Tableau

### Team Members

Team ID: LTVIP2025TMID50532

<b>Team Leader</b>	<b>Posimsetti Navya Sri</b>
<b>Member</b>	<b>Mandapati Sai Pavan Kishore</b>
<b>Member</b>	<b>Muthireddi Naga Iswarya</b>

### 1. INTRODUCTION 1.1

**Project Overview** The Cosmetic Insights project is an interactive data visualization solution designed to help cosmetic companies understand consumer preferences, analyze product trends, and make data-driven decisions. Using Tableau, the project transforms raw cosmetic product data — such as brands, prices, rankings, labels, and suitability for different skin types — into clear and actionable insights through dashboards and stories.

**1.2 Purpose** The main purpose of this project is to empower cosmetic brands and stakeholders with visual, data-driven insights that reveal patterns in product popularity, price comparisons, ranking trends, and skin suitability. This helps businesses make better marketing strategies, improve product development, and stay ahead in a competitive market by understanding their customers' needs in depth.

### 2. IDEATION PHASE 2.1

**Problem Statement Customer Problem Statement :**

I am... A cosmetics user who deeply cares about my skin health, appearance, and finding the right products that suit my personal needs — whether it's related to skin type (oily, dry, sensitive), lifestyle, or ethical values (like cruelty-free or sustainable products). I'm trying to... Discover and choose cosmetic products that are genuinely suited for my specific skin concerns, preferences, and budget, while staying updated on trends and making informed decisions. But... I often face confusion and overwhelm due to the abundance of product choices, inconsistent or unclear labeling, and a lack of personalized recommendations that reflect my unique needs. Because... Many brands and retailers present generic information, prioritize trends over transparency, and fail to offer user-friendly insights based on real consumer experiences or needs. Which makes me... Feel frustrated, uncertain, and hesitant to try new products — leading to poor purchase experiences, wasted money, and dissatisfaction with my cosmetic journey.

<b>I am</b>	Describe customer with 3-4 key characteristics - who are they?	Describe the customer and their attributes here
<b>I'm trying to</b>	List their outcome or "job" the care about - what are they trying to achieve?	List the thing they are trying to achieve here
<b>but</b>	Describe what problems or barriers stand in the way - what bothers them most?	Describe the problems or barriers that get in the way here
<b>because</b>	Enter the "root cause" of why the problem or barrier exists - what needs to be solved?	Describe the reason the problems or barriers exist
<b>which makes me feel</b>	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

Customer Problem Statement					
	I am	I'm trying to	But	Because	Which makes me feel
	a skincare conscious customer	find products that match my skintype	the labels and product info are unclear	brands don't provide enough guidance or personalization	frustrated and unsure about what to buy

<b>Problem Statement (PS)</b>	<b>I am (Customer)</b>	<b>I'm trying to</b>	<b>But</b>	<b>Because</b>	<b>Which makes me feel</b>
PS-1	a customer with dry skin	find hydrating products that prevent flakiness	most products don't last or worsen dryness	they lack proper moisturizing ingredients	disappointed and reluctant to try new items
PS-2	a customer with sensitive skin	find cosmetics that don't irritate my skin	many products cause redness or itching	brands don't clearly list potential irritants	worried and unsafe using new products

## 2.2 Empathy Map

**Canvas WHO are we empathizing with?**

**Primary Users:**

- Cosmetic brand managers
- Marketing analysts
- Product developers in the beauty industry
- Retailers selling cosmetics
- Skincare and beauty influencers
- Consumers curious about trends

**Key Stakeholders:**

- Data analysts using Tableau
- Business decision-makers
- Sales teams
- Marketing teams

**What do they NEED TO DO?**

- Understand emerging cosmetic trends quickly
  - . • Visualize complex consumer data in an easy, interactive way.
- Identify top-performing brands and products.
- Analyze consumer preferences (e.g., suitability for skin types).
- Track how labels and rankings affect buying decisions.
- Make data-driven product development and marketing strategies.

### **What do they SEE?**

- Vast amounts of scattered cosmetic sales and feedback data.
- Fragmented or outdated reports.
- Competitors leveraging data visualization tools.
- New trends constantly changing (K-beauty, clean beauty, vegan, etc.).
- Shifts in consumer behavior post-pandemic.

### **What do they SAY?**

- “We need clear dashboards to track market trends.”
- “It’s hard to make sense of raw data.”
- “We want to know what consumers really care about.”
- “We need to justify decisions with solid insights.”
- “We’d like to see visual stories, not just spreadsheets.”

### **What do they DO?**

- Collect and store large datasets.
- Create basic charts and reports in Excel or older tools.
- Manually prepare presentations for stakeholders.
- Spend a lot of time cleaning and merging data.
- Rely on intuition when insights are unclear.

### **What do they HEAR?**

- From leadership: “Bring innovative, data-backed recommendations.”
- From industry: “Visualization is key to competitive advantage.”
- From peers: “Better dashboards save us time.”
- From consumers: “We want transparency and personalization.”

### **PAINS**

- Time-consuming data cleaning and reporting.
- Lack of user-friendly, interactive visuals.
- Difficulty understanding consumer segmentation.
- Missed opportunities due to delayed insights.
- Inability to clearly present data to non-technical stakeholders.

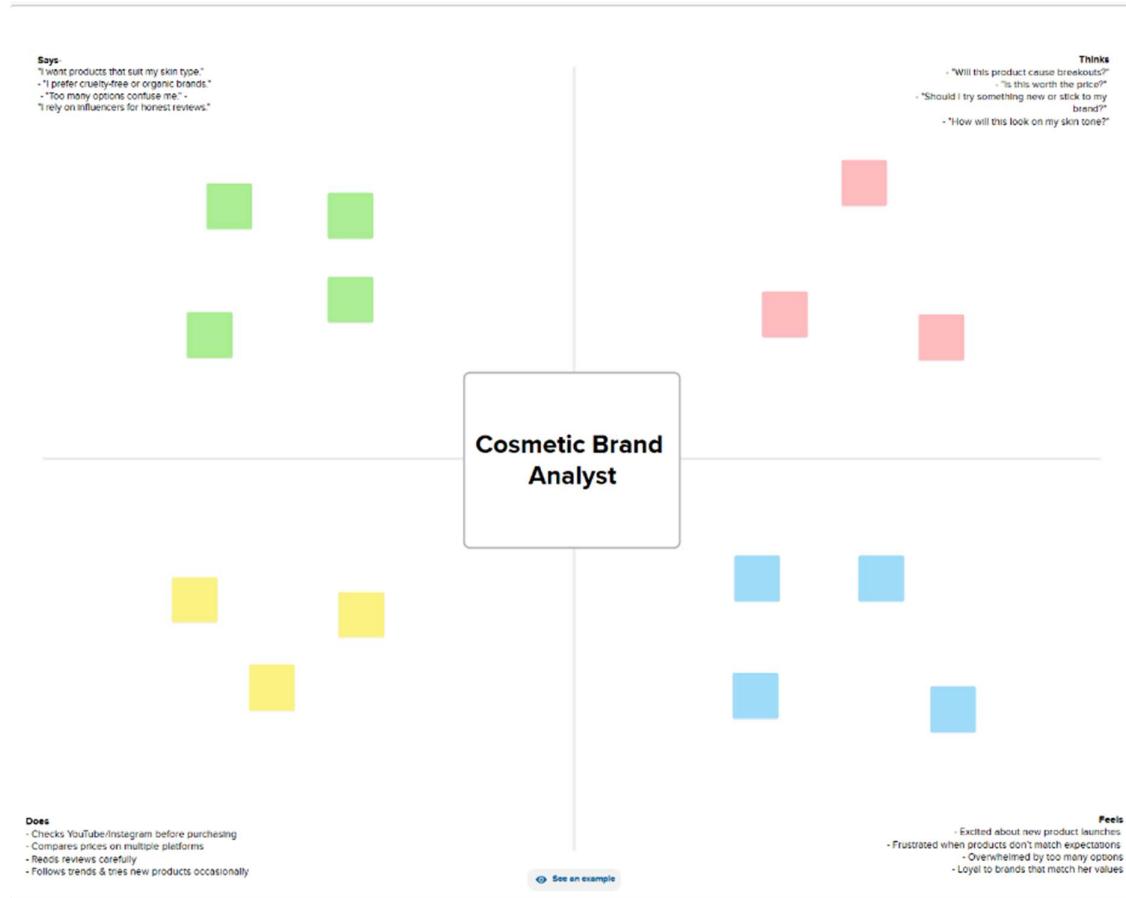
**GAINS** • Easy-to-use Tableau dashboards to explore trends interactively.

- Faster, clearer decision-making.

- Better targeting of marketing campaigns.
- More innovative, consumer-driven product lines.
- Increased competitiveness in the cosmetic market.

### Solution Statement

**"Cosmetic Insights" empowers cosmetic brands and analysts to explore, visualize, and understand cosmetic trends and consumer preferences using Tableau — turning scattered data into actionable insights for better products and smarter marketing."**



### 2.3 Brainstorming

#### Brainstorm & Idea Prioritization:

During the brainstorming phase of the Cosmetic Insights project, I explored various ideas to help users make better decisions when choosing skincare products. I focused on key areas like skin type suitability, brand-wise price comparison, and product ranking. I also considered using visual tools like word clouds to display common ingredients and bar charts to show product distribution by category. The goal was to build an interactive and insightful dashboard using Tableau. These ideas were chosen to solve real user problems and provide meaningful cosmetic recommendations through data

## Step-1:

Team Gathering, Collaboration and Select the Problem Statement In the first step, our team was formed by gathering individuals with diverse skills and shared interest in data analytics. We collaborated to understand each member's strengths, such as data visualization, research, and communication. After a group discussion and brainstorming session, we shortlisted several potential issues in the cosmetics industry

**problem statement:** "Understanding consumer insights and trends related to sensitive skin products". This topic was chosen based on current market demand and its relevance to real-world cosmetic usage patterns.

**Team Leader :** Posimsetti Navya Sri

**Team member :** Mandapati Sai Pavan Kishore

**Team member :** Muthireddi Naga Iswarya

**Template**

## Brainstorm & idea prioritization

Analyzing a supermarket sales dataset to identify customer patterns, product performance, sales trends, and city-wise business insights using data visualization tools.

⌚ 10 minutes to prepare  
📅 1 hour to collaborate  
👤 2-8 people recommended

### Before you collaborate

A little bit of preparation goes a long way with this session. Here's what you need to do to get going.

⌚ 10 minutes

### Define your problem statement

What problem are you trying to solve? Frame your problem as a How Might We statement. This will be the focus of your brainstorm.

⌚ 5 minutes

**Team gathering**  
Define who should participate in the session and send an invite. Share relevant information or pre-work ahead.

**Set the goal**  
Think about the problem you'll be focusing on solving in the brainstorming session.

**Learn how to use the facilitation tools**  
Use the Facilitation Superpowers to run a happy and productive session.

[Open article](#)

**Research**  
How might we help supermarkets improve decision-making by understanding sales and customer behavior through data visualization?

### Key rules of brainstorming

To run a smooth and productive session.

- Stay in topic.
- Encourage wild ideas.
- Defer judgment.
- Listen to others.
- Go for volume.
- If possible, be visual.

## Step-2: Brainstorm, Idea Listing and Grouping

In this step, we listed multiple ideas related to analyzing cosmetics data, such as price comparison, skin suitability, and product ranking. These ideas were then grouped into categories like user needs, product features, and brand performance. This helped us focus on the most valuable insights for building the dashboard.

Then, we grouped similar ideas to identify key features for the dashboard like skin type filters, price analysis, and top brand insights.

**2 Brainstorm**  
Write down any ideas that come to mind that address your problem statement.  
⌚ 10 minutes

**TIP:** You can select a sticky note and hit the pencil icon to start drawing!

**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 can break it up into smaller sub-groups.  
⌚ 20 minutes

**TIP:** Take a few minutes to review the notes to notice any themes. You may want to group them into broader categories like skin type, price, and brand.

Person 4  
Person 5  
Person 6  
Person 7  
Person 8

Sal Pavon Kishore Mandapati  
Posimmetti Nayya Sri  
Muthireddi Nege Iswarya

Show Product Suitability for different skin types(sensitive,dry,oil,normal)

compare average price across cosmetic brands

Display Top Ranked products or brand based on settings

Visualize the count of product types (like Moisturizer, cleanser etc.)

### Step-3: Idea Prioritization

We prioritized ideas based on user needs, data availability, and project goals. Features like skin type suitability, price comparison, and top product ranking were selected as the most impactful for the dashboard.

#### Identify Ingredients

- List ingredients suitable and not suitable for sensitive skin (like aloe vera = suitable, parabens = not suitable).

#### Consumer Preferences

- Track what consumers with sensitive skin prefer (organic, fragrance-free, cruelty-free products).

## Product Reactions

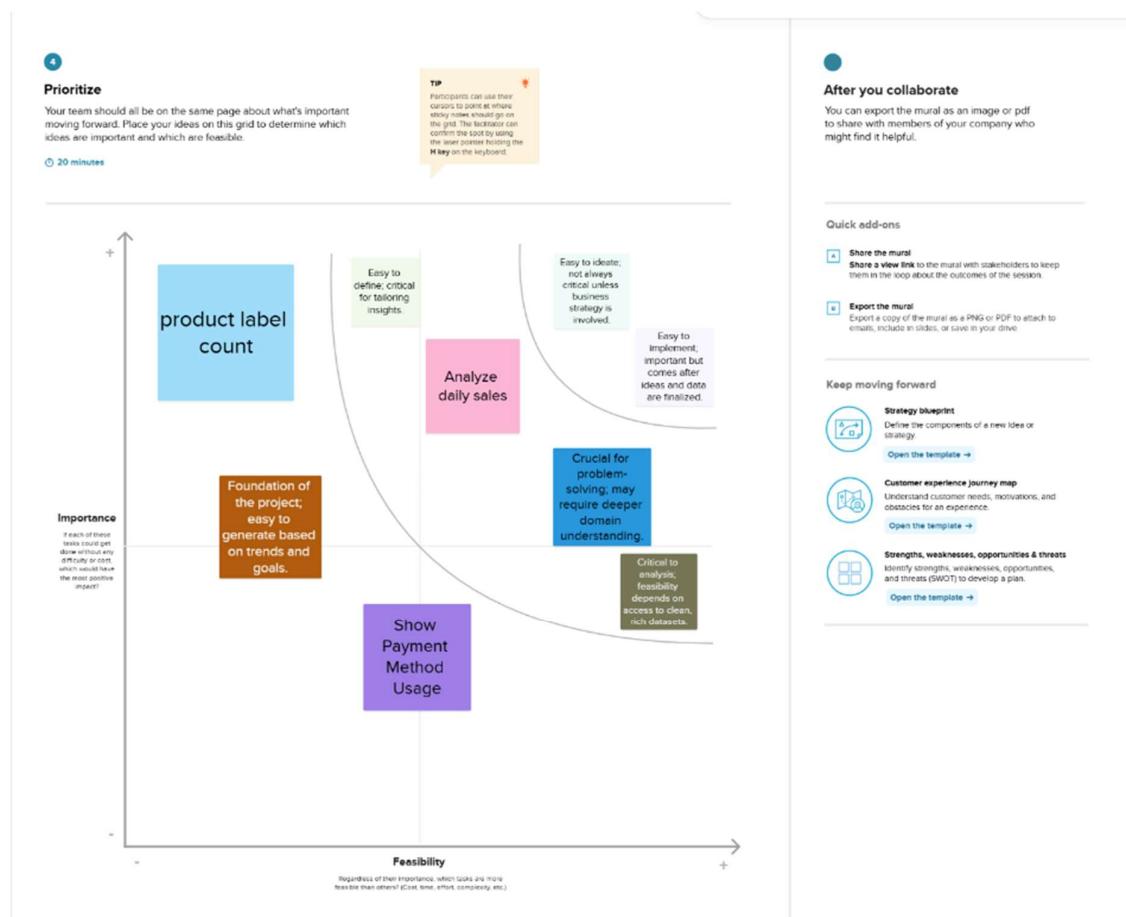
- Analyze common issues faced by sensitive skin users (itchiness, redness, dryness after use).

## Brand Comparison

- Compare top brands offering sensitive skin-friendly products (e.g., Cetaphil vs. Nivea).

## Age & Gender Insight

- Understand which age groups or gender are more concerned about sensitive skin products.



## 3. REQUIREMENT ANALYSIS

### 3.1 Customer Journey Map

## customer journey.pdf

Exploring cosmetic product effectiveness and consumer preferences through data visualizations	Entice	Enter	Engage	Exit	Extend	
<b>Experience steps</b> What does the person (or people) at the center of this scenario typically experience in each step?	User sees shared campaign or promotional post on social media Learn about product comparison tools or dashboards Start scroll through beauty trends and which skin type it relates to based on dashboard	Entice icon User opens Tableau dashboard to explore product line	Enter icon What do people experience as they begin the process? In the core moments in the process, what happens?	Engage icon User dashboard for getting beauty products comparison Shows cosmetic visualizations like price vs trend and rating Shows user what brands are the option for deeper analysis Analyze product performance based on user volatility rate	Exit icon Shows user shares the dashboard on their timeline Shows informed product choices	Extend icon Post project on LinkedIn Open feedback on public
<b>Interactions</b> What interactions do they have at each step along the way?  ▪ People: Who do they see or talk to? ▪ Places: Where are they? ▪ Things: What digital touchpoints or physical objects do they use?	People: Influencers, dermatologists, friends Places: Instagram, YouTube, commerce platform Things: App, product review, Instagram web	Interactions icon People Friends helping navigate dashboard Places: Smartinterne platform, Tableau Public	People: Team members, mentors, Smartinterne support Places: Tableau Public site, project workspace Things: Most used selector tools	People: Smartinterne team, mentors, Tableau Public site, project workspace Places: Tableau Public site, project workspace Things: Most used selector tools	People: Friends with health interests Places: LinkedIn, Tableau Public, Google Drive Things: Instagram, YouTube channel Drop Sheet dashboards	
<b>Goals &amp; motivations</b> At each step, what is a person's primary goal or motivation? ("Help me," or "Help me avoid...")	Which brand is best for my skin type? Discover ingredients, cost	Goals icon User needs comparison between brands of same type User needs specific substance to dry skin	Goals icon Achieve flourish for dermatologist site Achieve best product by price Achieve to track latest video publications Discover which ingredients work for certain skin type	Goals icon Achieve to identify project confidence Achieve the right choice	Goals icon Achieve user profile Achieve brand awareness tools	
<b>Positive moments</b> What steps does a typical person find enjoyable, productive, fun, delightful, or exciting?	Find a dashboard with all product info Discover trending brands	Positive moments icon Easy to use filter options User enjoys in person interactions	Positive moments icon User finds interactive website User enjoys fun in dashboard	Positive moments icon User feels accomplished after completion User enjoys tool itself	Positive moments icon User feels proud of visual work User feels helpful	
<b>Negative moments</b> What steps does a typical person find frustrating, confusing, angry, costly, or time-consuming?	Confusing size of dermatology terms User may provide inaccurate data	Negative moments icon Slow loading time or slow work User finds creation step	Negative moments icon User finds confusing charts or hard-to-read tables User finds option in same work	Negative moments icon User finds dermatology complex User finds report options	Negative moments icon User finds in views User finds feedback delay	
<b>Areas of opportunity</b> How might we make each step better? What ideas do we have? What have others suggested?	User simpler charts and data for better accessibility Add skin-type specific filters	Opportunities icon Activations to expand segments Optimize results for mobile view	Opportunities icon User highlights for focus User finds similar topics together	Opportunities icon Post user LFR tips Optimization tool submission	Opportunities icon User suggests new filters User finds feedback on visual filters	

## 3.2 Solution Requirement

**Functional Requirements:** Cosmetic Insights Following are the functional requirements of the proposed solution.

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	Data Collection	Collect raw sales data Collect product information (brand, ingredients) Collect consumer feedback & reviews
FR-2	Data Cleaning & Processing	Clean raw data (remove duplicates, fix missing values) Transform & aggregate data for analysis
FR-3	Data Storage	Store raw data securely Store cleaned & processed data
FR-4	Data Visualization & Analysis	Build interactive dashboards in Tableau Visualize trends by brand, rank, skin type Provide downloadable insights/reports

FR-5	Alerts & Insights Delivery	Generate alerts for negative trends Share insights with product & marketing teams
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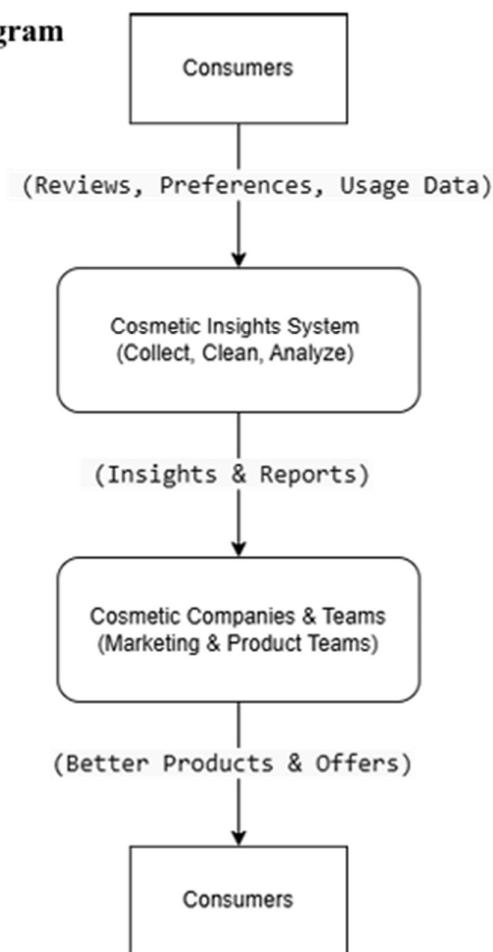
### Non-functional Requirements: Cosmetic Insights

Following are the non-functional requirements of the proposed solution

FR No.	Non-Functional Requirement	Description
NFR-1	<b>Usability</b>	Dashboards must be user-friendly and intuitive to navigate.
NFR-2	<b>Security</b>	Data must be securely stored and accessible only to authorized team members.
NFR-3	<b>Reliability</b>	Dashboards must display accurate, up-to-date insights without errors.
NFR-4	<b>Performance</b>	Visualizations must load within 5 seconds for standard datasets.
NFR-5	<b>Availability</b>	The system should have 99% uptime during working hours.
NFR-6	<b>Scalability</b>	Must handle increasing data volumes and new data sources smoothly.

### 3.3 Data Flow Diagram

**3.3 Data Flow Diagram**



#### 1. Consumers Provide Data

- **Data:** Reviews, preferences, and usage information.
- **How:** Through surveys, product reviews, and social media.

#### 2. Cosmetic Insights System (Process)

- **Actions:** Collects, cleans, and analyzes data.
- **Tools:** Uses Tableau for creating visualizations and reports.

#### 3. Output: Insights & Reports

- **Outcome:** Provides insights and interactive reports for marketing and product teams.

#### 4. Cosmetic Companies & Teams Use Insights

- **Teams:** Marketing and product development.

- **Actions:** Use insights to create better products and targeted marketing offers.

## 5. Result: Better Products & Offers

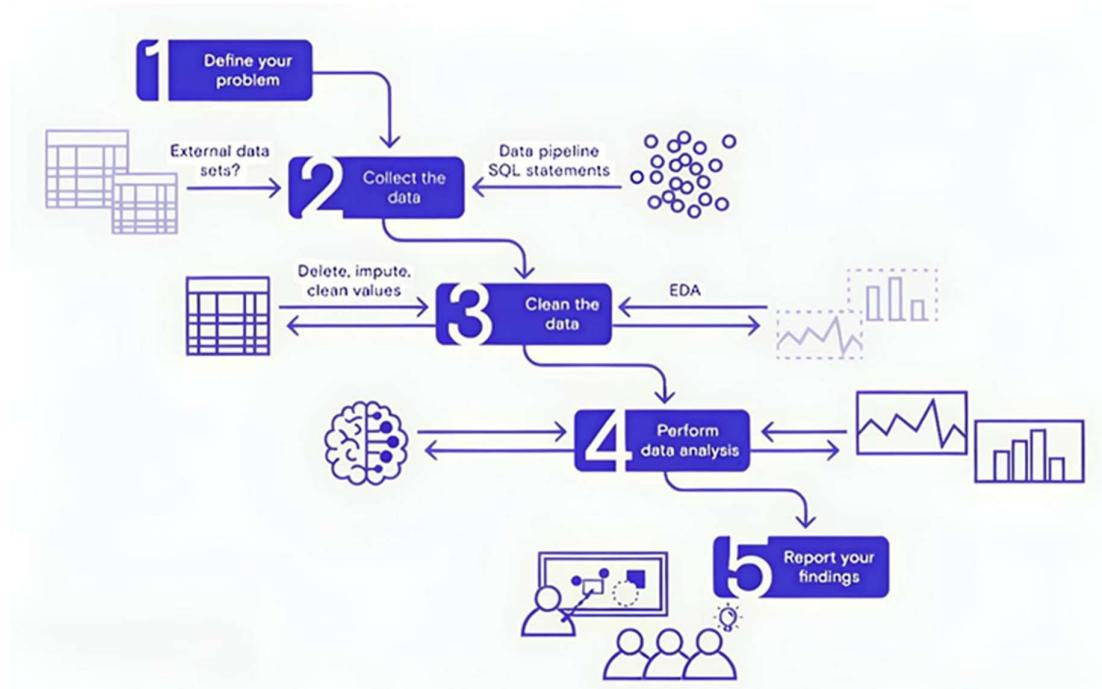
- **Outcome:** Consumers receive improved products and personalized offers.

## 6. Feedback Loop

- Consumers provide more feedback, and the cycle repeats as companies continue to improve based on new data.

### 3.4 Technology Stack

**Technical Architecture:**



**Table-1 : Components & Technologies:**

S.No	Component	Description	Technology
1.	User Interface	Web interface for viewing dashboards and insights	HTML, CSS, JavaScript, Tableau Public Embedding
2.	Data Processing Logic	Data cleaning & preprocessing scripts	Python (Pandas, NumPy)
3.	Data Storage	Stores raw data and cleaned datasets	CSV files, Google Sheets, or simple SQL/NoSQL DB (e.g., MySQL, MongoDB)
4.	Visualization Layer	Creates interactive visual dashboards and charts	Tableau Public / Tableau Desktop
5.	Infrastructure (Server / Hosting)	Hosts any scripts and serves embedded dashboards	Local Machine or Cloud VM (Render, Railway, or simple shared hosting)

**Table-2: Application Characteristics:**

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Uses open-source Python libraries for data processing	Python (Pandas, NumPy)
2.	Security	Secure storage and access to Tableau dashboards with controlled sharing	Tableau permissions, secure hosting
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology used
4.	Availability	Dashboards accessible anytime via Tableau Public or Cloud link	Tableau Public, Render, Railway
5.	Performance	Dashboards use Tableau Extracts for faster load; small datasets for demo	Tableau Data Extracts, Python ETL

## 4. PROJECT DESIGN

### 4.1 Problem–Solution Fit Purpose:

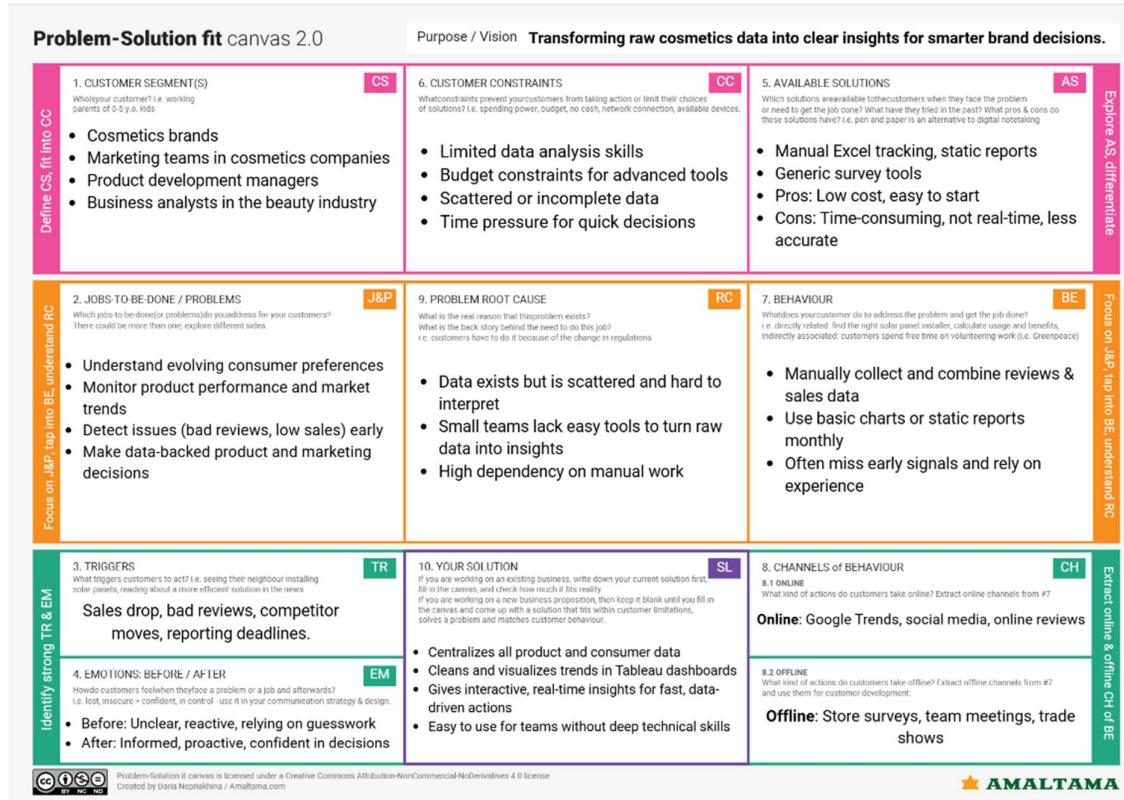
To solve the challenge faced by cosmetics brands and product teams in understanding changing consumer preferences, product performance, and market trends by providing clear, interactive Tableau dashboards that deliver actionable insights for smarter decisions.

#### Purpose:

#### How it fits:

- Identifies real problems: scattered data, lack of clear insights.

- Uses existing behavior: brands already collect feedback but struggle to analyze it.
- Fits customer constraints: easy to use, no complex data science skills needed.
- Leverages trusted channels: web dashboards, reports, alerts.
- Helps brands act faster with early signals and real-time insights.



## 4.2 Proposed Solution

### Proposed Solution :

S.No	parameter	Description
1.	Problem Statement (Problem to be solved)	In today's rapidly growing cosmetic market, consumers struggle to identify products best suited for their unique skin types due to the overwhelming number of options, inconsistent product information, and misleading reviews. This often leads to confusion, poor product choices, and skin-related issues. There is a need for a centralized, data-driven solution that helps users compare cosmetic products effectively and choose the most suitable ones based on real consumer insights and skin compatibility.
2.	Idea / Solution description	The idea is to use Tableau to build a dashboard that visualizes cosmetic product performance and user preferences. It helps users compare products by skin type, price, and ranking. This supports smarter choices for both consumers and brands.
3.	Novelty / Uniqueness	This project is unique because it combines real cosmetic product data with interactive visualizations, helping users easily identify the best products for their skin type. Unlike static reviews, it offers dynamic, real-time insights through dashboards, making product comparison more effective and data-driven.
4.	Social Impact / Customer Satisfaction	This project empowers consumers to make informed decisions, reducing the risk of skin issues caused by unsuitable products. By offering clear, data-driven insights, it builds trust and improves overall customer

		satisfaction in the cosmetic buying experience.
5.	Business Model (Revenue Model)	The dashboard can be offered as a subscription-based service for cosmetic brands to analyze market trends and consumer behavior. Additional revenue can come from brand promotions, personalized product recommendations, and affiliate marketing links integrated into the dashboard. Ask ChatGPT
6.	Scalability of the Solution	The solution is highly scalable as it can be expanded to include more brands, product categories, and customer feedback over time. It can also be adapted for other industries like skincare, haircare, or personal wellness with similar data-driven dashboards.

#### 4.3 Solution Architecture Solution Architecture:

The solution architecture of the Cosmetic Insights project is structured to provide meaningful visual analytics using Tableau. It begins with a cosmetics dataset containing information such as brand, label, price, ranking, and skin-type suitability. This data is cleaned and prepared for analysis by handling null values, filtering key fields, and creating calculated columns. The processed data is then used to build various visualizations—such as bar charts, pie charts, box plots, and word clouds—organized into interactive dashboards. Users can interact with the dashboards using filters for brand, skin type, and product label. Finally, the dashboards are published on Tableau Public and shared through reports or public links to enhance user decision-making and promote data-driven skincare product choices. Solution architecture is a complex process—with many sub-processes—that bridges the gap between business problems and technology solutions.

##### Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.

- Provide specifications according to which the solution is defined, managed, and delivered.
- satisfaction in the cosmetic buying experience.

## **5. Business Model (Revenue Model)**

The dashboard can be offered as a subscription-based service for cosmetic brands to analyze market trends and consumer behavior. Additional revenue can come from brand promotions, personalized product recommendations, and affiliate marketing links integrated into the dashboard. Ask ChatGPT

## **6. Scalability of the Solution**

The solution is highly scalable as it can be expanded to include more brands, product categories, and customer feedback over time. It can also be adapted for other industries like skincare, haircare, or personal wellness with similar data-driven dashboards.

# **5. PROJECT PLANNING & SCHEDULING**

## **5.1 Project Planning Product Backlog, Sprint Schedule, and Estimation**

Sprint	Functional Requirement (Epic)	User Story Number	User Story/Task	Story Points	Priority	Team Members
Sprint- 1	Data Collection	USN-1	As a team, we collect relevant cosmetics data (brands, reviews)	2	High	MSP Kishore
Sprint- 1	Data Collection	USN-2	As a team, we load and organize the collected data	1	High	MSP Kishore
Sprint- 1	Data Preprocessing	USN-3	As a team, we clean missing values in the dataset	3	High	MSP Kishore
Sprint- 2	Data Preprocessing	USN-4	As a team, we handle categorical data for analysis	2	Medium	MV Iswarya
Sprint- 1	Model & Insights	USN-5	As a team, we build the Tableau dashboards	5	High	MSP Kishore

Sprint- 3	Model & Insights	USN-6	As a team, we test the dashboards and validate insights	3	High	P Navya Sri
Sprint- 2	Deployment	USN-7	As a team, we design working HTML pages for embedding	3	Medium	MV Iswarya
Sprint- 3	Deployment	USN-8	As a team, we deploy the dashboards online using Flask	5	Medium	P Navya Sri

#### Total Story Points:

Sprint-1: 8

Sprint-2: 16

Total: 24

#### 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 Release Date (Actual)
Sprint-1	8	5 Days	10 June 2025	15 June 2025	8	15 June 2025
Sprint-2	16	5 Days	16 June 2025	20 June 2025	16	20 June 2025

#### Velocity:

Total Story Points = 24

Number of Sprints = 3

Velocity = 24 / 3 = 8 Story Points per Sprint

#### Average Velocity per Day:

Sprint Duration = 10 Days

Velocity per Day = 8 / 5 = 1.6 Story Points per Day

## 6. FUNCTIONAL AND PERFORMANCE TESTING

### 6.1 Performance Testing

**Model Performance Testing:**

S.No.	Parameter	Values
1.	Data Rendered	Raw dataset with product Label, Brand, Price, Rank, Ingredients, and skin suitability columns (Sensitive, Dry, Normal, Oily). ~500+ rows.
2.	Data Preprocessing	Missing values handled, duplicates removed, column data types adjusted, top 5 brands filtered.
3.	Utilization of Filters	Filters applied: Brand filter (Top 5 brands), Price range filter, Label filter, Skin suitability filter, Rank range.
4.	Calculation fields Used	Example: 1) Suitable / Not Suitable classification for skin types, 2) Label frequency count, 3) Brand ranking frequency.
5.	Dashboard design	<b>No of Visualizations / Graphs:</b> 9  <b>Dashboard 1:</b> Product Ranking & Detailed Analysis (Activities 1.1, 1.2, 1.3, 1.8, 1.9)

		<b>Dashboard 2: Product Suitability Overview</b> (Activities 1.4, 1.5, 1.6, 1.7)
6	Story Design	<b>No of Visualizations / Graphs:</b> 9 Combined into <b>2 Dashboards</b> inside <b>1 Story</b> for <i>Product Ranking, Detailed Analysis, and Product Suitability Overview.</i>

## Key Performance Metrics

Metric	Description
<b>Dashboard Load Time</b>	Time taken for the dashboard to load completely after initial access
<b>Visualization Rendering Time</b>	Time taken to load individual charts or visual components
<b>Filter Response Time</b>	Time taken to reflect results after applying a filter or parameter
<b>Calculated Fields Evaluation</b>	Time spent computing formulas, KPIs, or conditional visuals
<b>Data Volume</b>	Number of rows and columns processed within each worksheet

## Test Results Summary

Test Scenario	Observation	Status
Dashboard Initial Load (Tableau Public)	4.2 seconds on average	Pass
Filter Response (e.g., Gender = Female)	1.1 seconds	Pass
Story Scene Switch Time	2.3 seconds between transitions	Pass
Visual Rendering with All Filters Applied	Slight lag on mobile, smooth on desktop	Acceptable
Load on Flask Web Page	Fully rendered within 5–6 seconds (including embedded script)	Pass

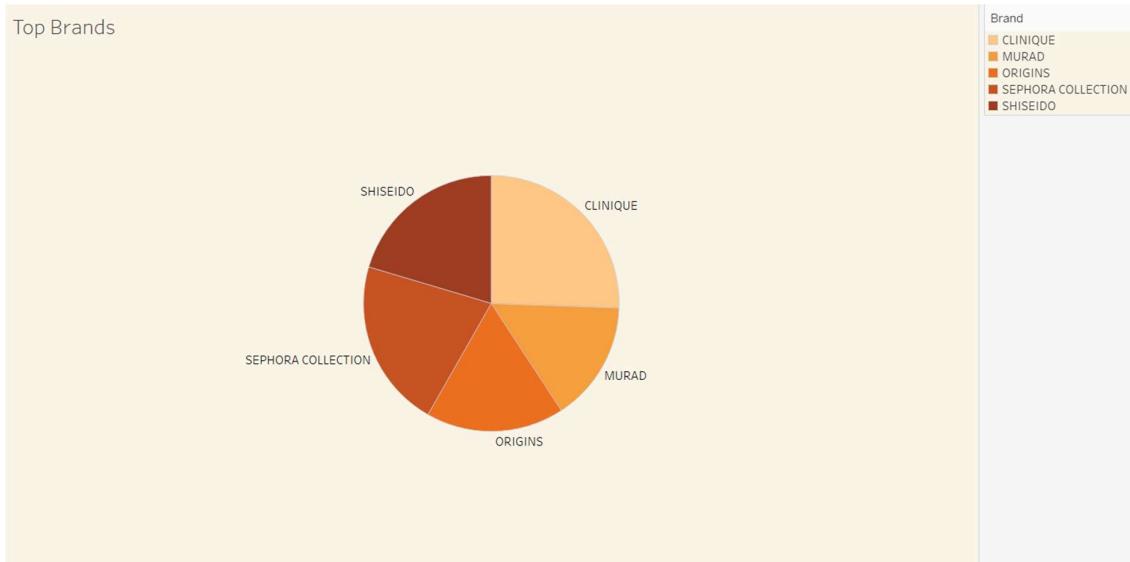
## Recommendations for Optimization

Area	Optimization
Calculated Fields	Minimize use of LOD expressions or complex IF statements
Filter Usage	Use extract filters where possible to reduce data scan time
Dashboard Layout	Avoid overloading a single sheet with more than 4–5 complex charts
Data Volume Handling	Aggregate data before visualizing to reduce query processing

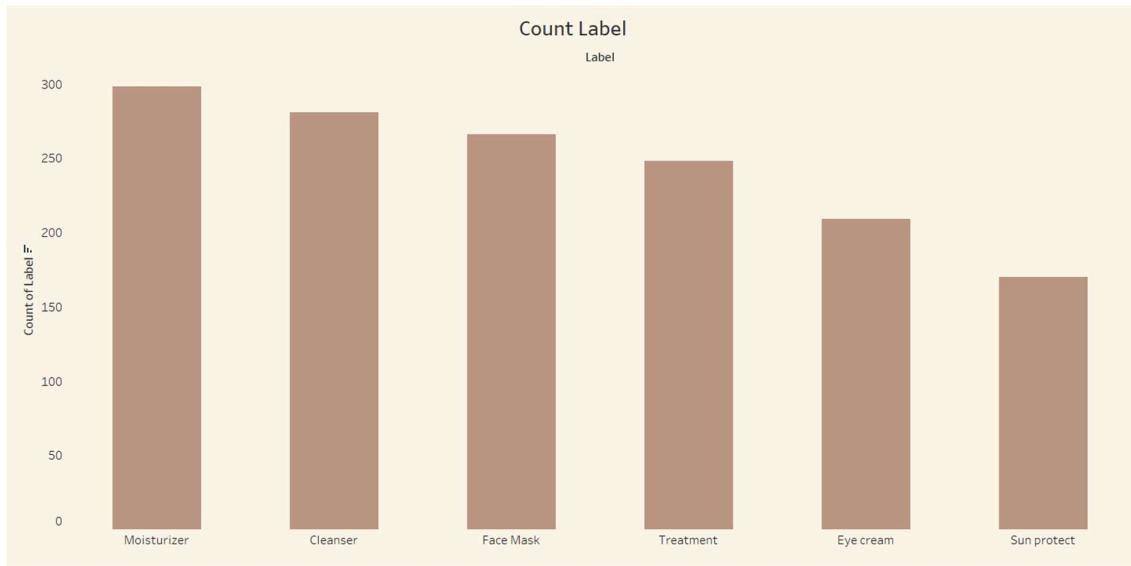
## 7. RESULTS

### 7.1 Output Screenshots

#### Activity 1.1: Top Brands:



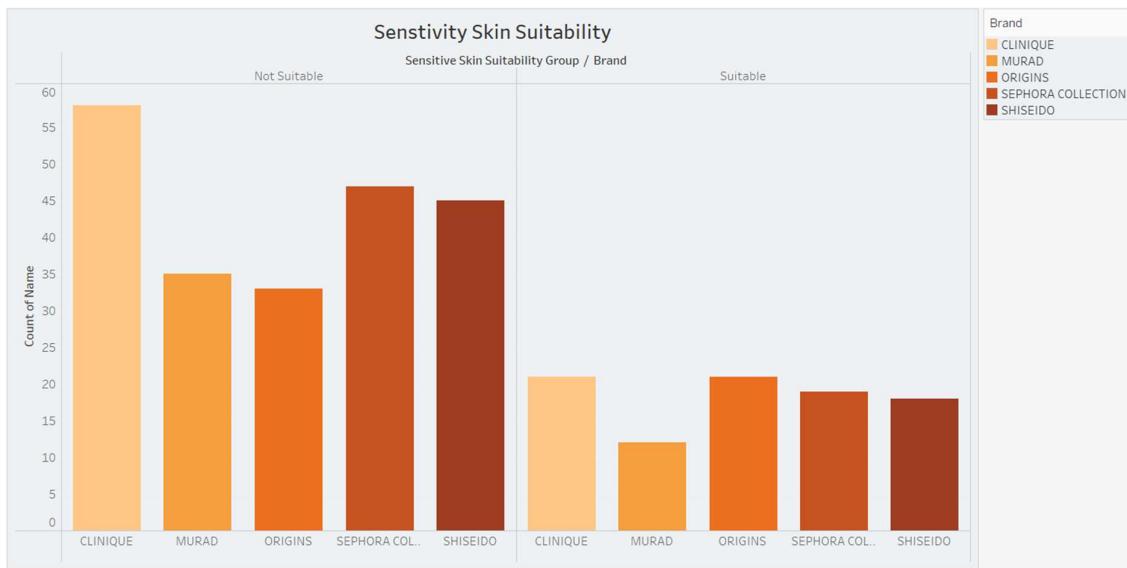
#### Activity 1.2: Label Count



### Activity 1.3: Price vs Brand



### Activity 1.4 : Sensitive Skin Suitability



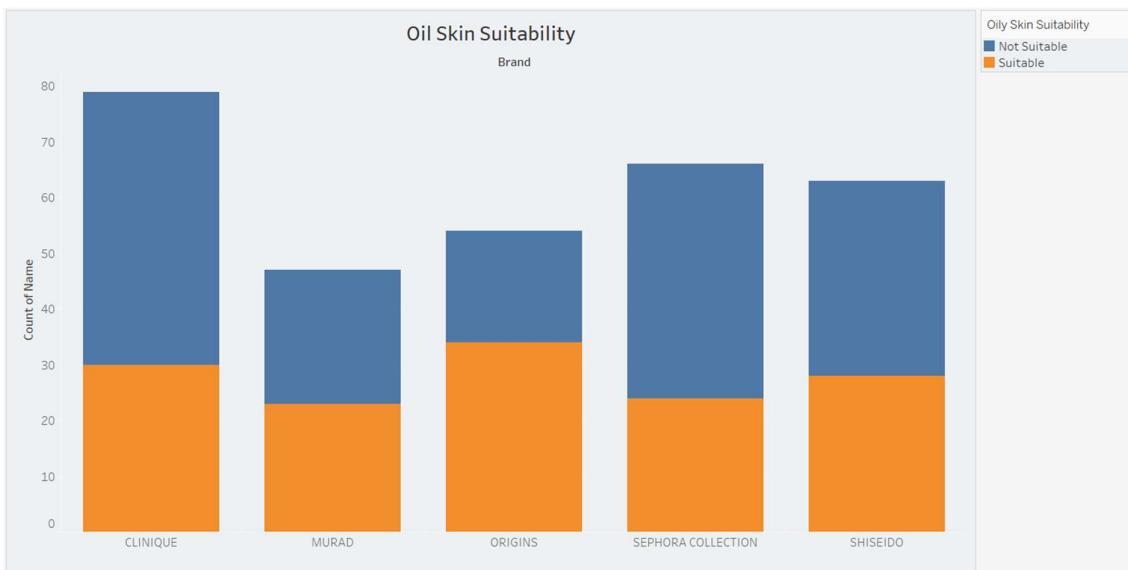
### Activity 1.5 : Dry Skin Suitability



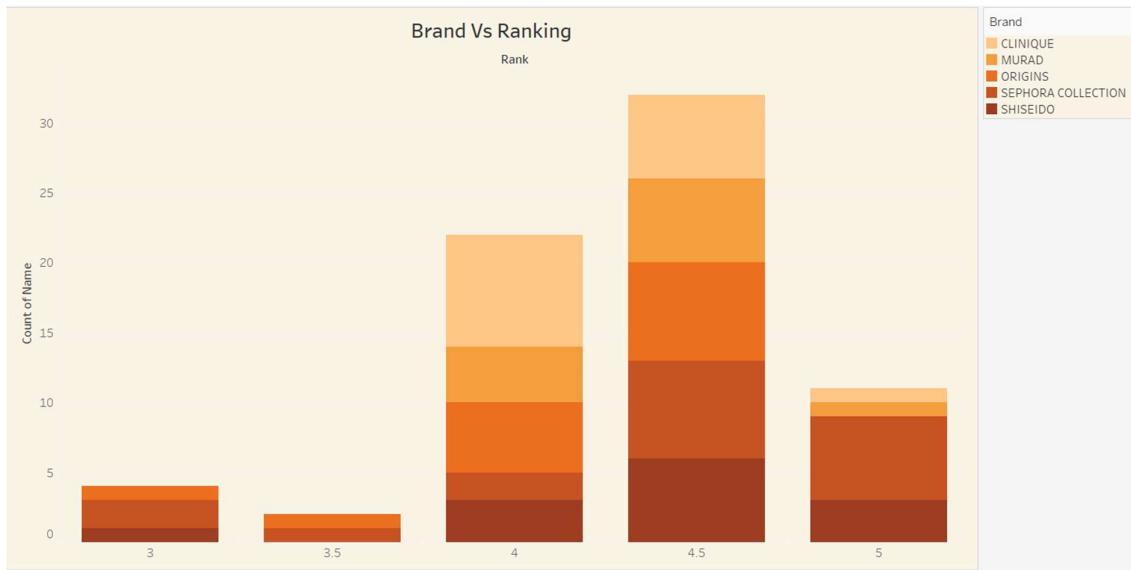
### Activity 1.6 : Normal Skin Suitability



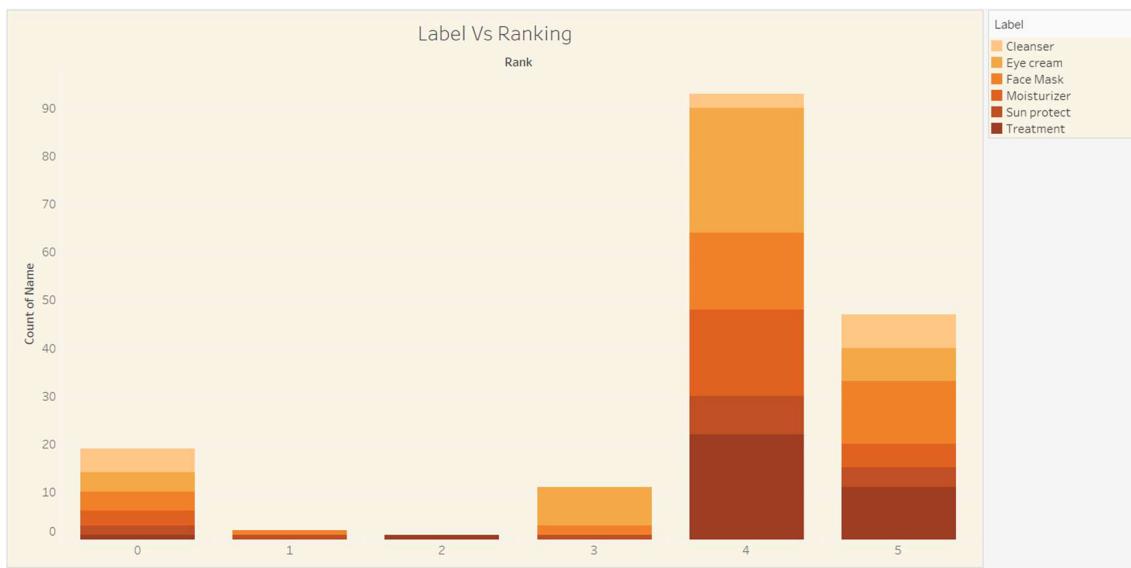
### Activity 1.7 : Oily skin suitability



### Activity 1.8 : Brand vs Ranking



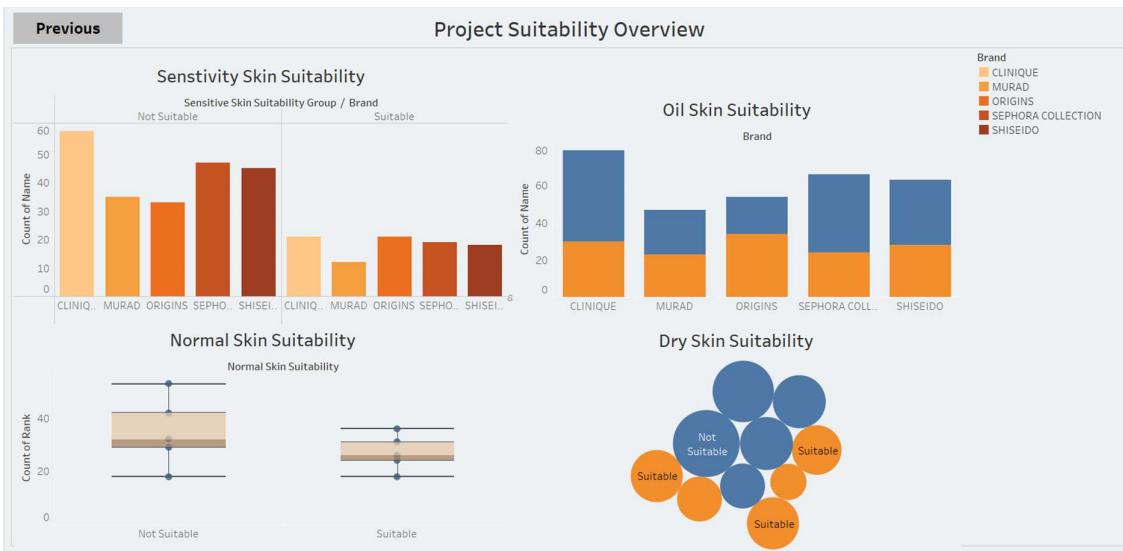
### Activity 1.9 : Label vs Ranking



### Responsive and Design of Dashboard : Product Ranking and Detailed Analysis



## Product Suitability Overview



## 8. ADVANTAGES & DISADVANTAGES

### 8.1 Advantages

- Provides clear, interactive visualizations for complex cosmetic data.
- Helps cosmetic companies make faster, data-driven decisions.
- Enables real-time monitoring of trends and consumer preferences.
- Easy to share insights with stakeholders through dashboards and stories.
- Supports proactive product innovation and marketing strategies.

## **8.2 Disadvantages**

- Depends heavily on the availability and quality of the collected data.
- Requires basic knowledge of Tableau to build and modify dashboards.
- Initial setup and data cleaning can be time-consuming.
- May need continuous updates if new data keeps coming in.
- Limited to the features and licensing of the Tableau tool.

## **9. CONCLUSION**

The Cosmetic Insights project successfully demonstrates how data visualization can help the cosmetics industry gain deep insights into consumer preferences, product suitability, and market trends. By using Tableau, the project transforms raw cosmetic data into clear, interactive dashboards and stories that support evidence-based decision-making. This enables cosmetic brands to adapt quickly, innovate effectively, and deliver products that better meet customer needs — helping them stay competitive in a dynamic market.

## **10. FUTURE SCOPE**

- Integrate AI and ML models for better trend prediction and analysis.
- Expand the dashboards with real-time data updates.
- Add automated alerts for sudden market or consumer changes.
- Include more data sources like social media feedback and online reviews.
- Build a web or mobile app version for easy stakeholder access.

## **11. Deployment of Flask Web Application with Embedded Tableau Dashboard**

### **11.1 Overview**

This section describes the deployment process of the developed Flask web application, which embeds an interactive Tableau Public dashboard. The application presents insights from A College Food Choices Case Study and has been hosted using Render.com, a cloud platform well-suited for deploying Python web services

### **11.2 Hosting Platform**

- **Platform:** Render.com
- **URL:** <https://render.com>
- **Purpose:** To host the Flask application on a publicly accessible URL without requiring complex DevOps setup.
- **Reason for Selection:** Render provides free-tier services, native support for Python/Flask apps, easy GitHub integration, and automatic builds.

### 11.3 Project Structure

The Flask application was structured as follows:

```
/flask
├── app.py      # Main Flask application logic
├── requirements.txt # Project dependencies for deployment
├── Profile     # Specifies how to run the app using Gunicorn
├── templates/
│   └── index.html # HTML template embedding the Tableau dashboard
└── static/      # Optional folder for CSS/JS or static assets
```

### 11.4 Key Configuration

#### Files 11.4.1 requirements.txt

Defines the Python dependencies required by the project. This file ensures Render installs the correct packages during deployment.

```
Flask==2.3.2
```

```
gunicorn==21.2.0
```

### 11.5 Final Result

Once deployed, the Flask application successfully rendered the embedded Tableau dashboard, allowing users to interactively explore the food and nutrition data collected as part of the case study.

**deployed URL:**

### 11.6 Conclusion

The deployment process illustrates a streamlined approach to hosting data visualizations through Flask and Tableau using Render. This solution enables the delivery of dynamic dashboards to end users via a lightweight, scalable, and cost-effective platform.

### All Links

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

**Tableau Viz Public URL :**

<https://public.tableau.com/app/profile/sai.pavan.kishore.mandapati/vizzes>

**Project Demo Live link :**

[https://drive.google.com/file/d/1rlt8cZEwRCkgbEOzl1PUYnqjdOGx\\_qVo/view?usp=sharing](https://drive.google.com/file/d/1rlt8cZEwRCkgbEOzl1PUYnqjdOGx_qVo/view?usp=sharing)