

Project Report Format

1. INTRODUCTION :-

1.1 Project Overview

This project analyzes cosmetics data to understand consumer preferences, brand performance, and product suitability across skin types using Tableau. It provides interactive dashboards to support data-driven decisions in the beauty industry.

1.2 Purpose

To provide meaningful insights to cosmetic brands by visualizing data on price, skintype suitability, and product trends using Tableau.

2. IDEATION PHASE

2.1 Problem Statement

Example:- Cosmetic Insights – Navigating Cosmetics Trends and Consumer Insights with Tableau



Customer Problem Statement Template for Cosmetic Insights – Navigating Cosmetics Trends and Consumer Insights with Tableau:

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	a skincare enthusiast	find trending but affordable cosmetic products that suit my skin type	the market has too many products with confusing claims	there's no centralized data that shows real consumer insights or trend patterns	overwhelmed and unsure about what to buy
PS-2	a cosmetic brand marketer	understand customer preferences and emerging beauty trends	traditional surveys and social media tracking give incomplete or biased results	they lack realtime, datadriven visual insights	frustrated and uncertain while planning product campaigns

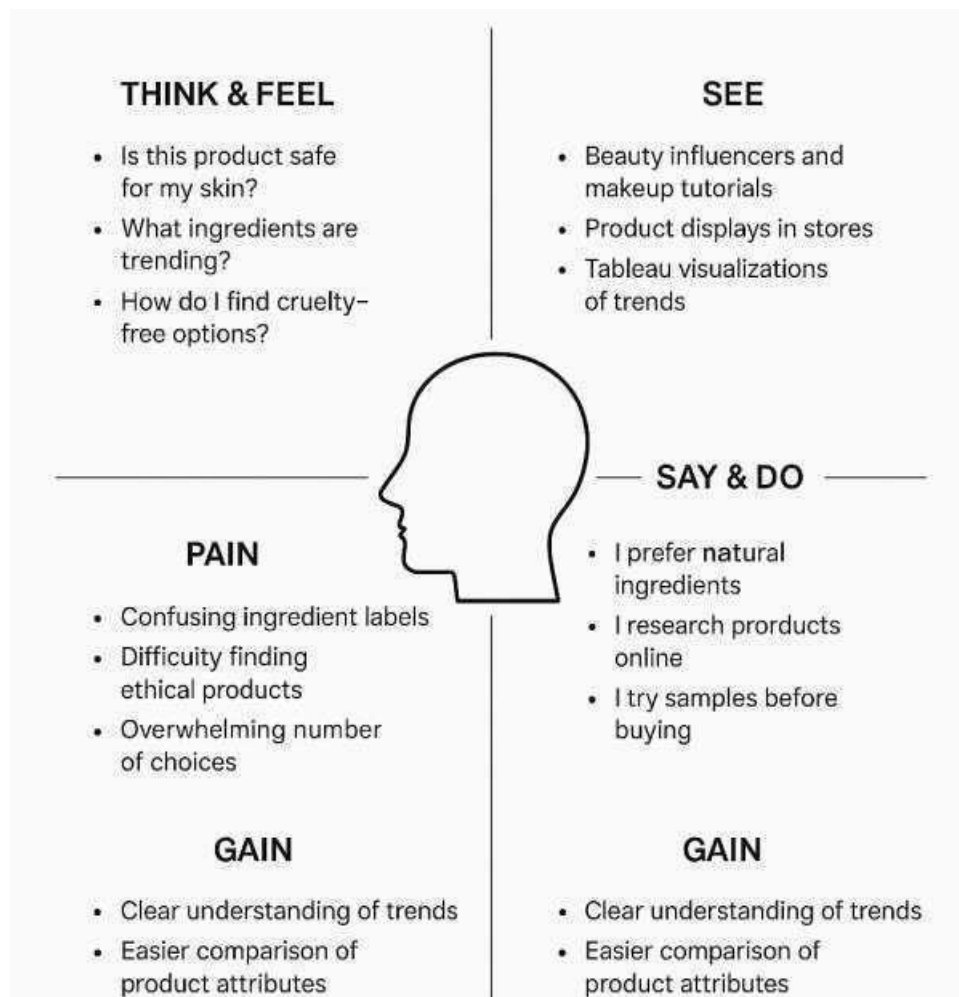
2.2 Empathy Map Canvas

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.

Example:- Cosmetic Insights – Navigating Cosmetics Trends and Consumer Insights with Tableau



2.3 Brainstorming

Problem: Understanding how cosmetic brands and products perform across pricing, skin- type suitability, and popularity using Tableau visualizations. **Step 2:**

Brainstorming, Idea Listing and Grouping:

Idea	Group
Show total products per label	Category Overview
Compare average price by brand	Brand Analysis
Use pie chart for top brands	Brand Performance
Analyze skin suitability across dry/oily/normal/sensitive	Suitability Analysis
Word cloud for top ingredients	Ingredient Trends
Filters for skin type and brand	Interactivity
Publish dashboards to Tableau Public	Deployment

Step 3: Idea Prioritization:

Idea	Feasibility	Impact	Priority
Suitability per skin type	High	High	High
Brand vs Rank	High	High	High
Label Count & Label vs Rank	High	Medium	High
Word Cloud of Ingredients	Medium	Medium	Medium
Filters(skin type, label,brand)	High	High	High
Public dashboard to Tableau Public	High	Medium	Medium

3. REQUIREMENT ANALYSIS

3.1 Customer Journey map

Step	What does the person typically experience?	Interactions	Things (Digital/Physical Touchpoints)	Places	People	Goals & Motivation	Positive Moments	Negative Moments	Areas of Opportunity
Entice (Awareness)	Sees ads or influencer videos about trending products	Scrolls social media, watches beauty videos	Instagram, YouTube, brand-sponsored posts	At home, on phone	Influencers, friends	Help me discover new trending cosmetics	Sees something exciting & trendy	Unsure if product works for them	Offer data-driven trend rankings in Tableau
Engage (Explore)	Researches products online and compares options	Uses search engines, brand sites, reviews	Google, cosmetic websites, blog articles	Phone or PC at home	Beauty bloggers, website authors	Help me find what fits my skin type and budget	Enjoys reading positive reviews	Gets confused with too many choices	Use Tableau to compare by skin type, price, trend score
Evaluate (Shortlist)	Narrow down top products and reads detailed reviews	Clicks reviews, checks ingredients, ratings	Ecommerce sites, comparison charts, reviews	Online stores	No People –solo browsing	Help me pick the safest and best option	Finds a highly rated product with real photos	Fake reviews or misleading claims	Use Tableau visuals to show verified reviews, ingredient data
Purchase (Buy)	Adds product to cart and completes payment	Fills in details, confirms order	Amazon, Nikai, Flipkart, etc.	Website or mobile app	Optional: chats with support	Help me feel sure I bought the right product	Finds coupon or quick delivery	Fears product is fake or won't work	Add verified seller visual cues, ratings in dashboard
Experience (Use product)	Uses the product over a few days/weeks	Applies it, takes selfies, monitors skin	Mirror, phone camera, skincare product	Home, washroom	Self, family, or online community	Help me improve my skin/look without side effects	Sees improvement and feels confident	Breakouts or no visible change	Visual dashboards showing % of users who saw results
Reflect & Share (Feedback)	Shares review or photo, sometimes uploads to social	Posts review, star ratings, hashtags	Review platforms, Instagram	Phone or desktop	Online followers, friends	Help me share my experience & guide others	Gets likes or comments on review	Long review process or no response	Allow fast 1-click reviews; highlight visuals for sharing
Re-Engage (Retention)	Gets product recommendations based on past purchase	Clicks on smart suggestions	Email, ecommerce apps, Tableau dashboard	Phone or PC	Brand systems	Help me find my next ideal product	Relevant and personalized suggestions	Generic or wrong suggestions	Use Tableau to show personalized insights & upsell matches

3.2 Solution Requirement

Functional Requirements:-

Following are the functional requirements of the proposed solution

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	Product Search & Filtering	Filter by skin type Sort by trend score, rating, price
FR-4	Trend Analytics Dashboard	View dashboard with top cosmetics See charts by skin type, region
FR-5	Product Comparison	Compare 2 or more products by price, rating, ingredients
FR-6	Feedback Submission	Rate/review products Submit quick emoji-based feedback

Non-functional Requirements:-

Following are the non-functional requirements of the proposed solution

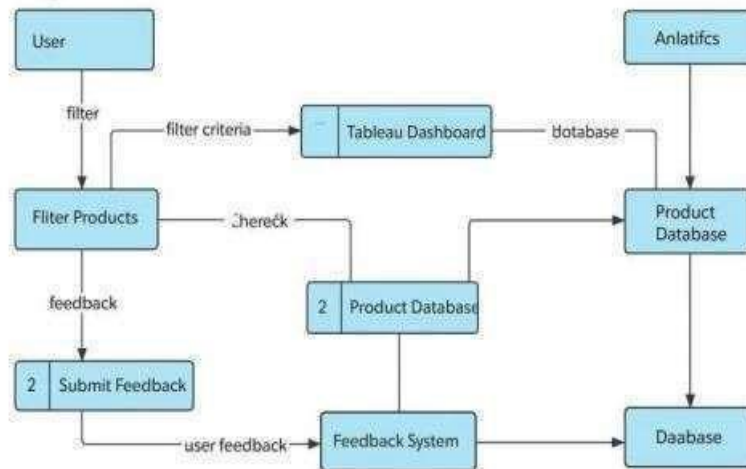
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	The dashboard should be simple, clean, and intuitive for users of all experience levels.
NFR-2	Security	All user data, including logins and feedback, must be securely stored and transmitted (e.g., HTTPS).
NFR-3	Reliability	The application should be available 99.5% of the time and handle data errors gracefully.
NFR-4	Performance	Dashboard and filters should load in under 3 seconds with live data refresh support.
NFR-5	Availability	The system should support 24/7 access across all devices with no downtime during business hours.
NFR-6	Scalability	Should scale to handle growing user base and increasing data from new products and reviews.

3.3 Data Flow Diagram

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.

Example:-DFD Diagram for Cosmetic Insights – Navigating Cosmetics Trends and Consumer Insights with Tableau:

Cosmetic Insights – Navigating Cosmetics Trends and Consumer Insights with Tableau



User Stories:

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance criteria	Priority	Release
Customer (Web)	View Product Trends	USN-1	As a customer, I can view top-rated cosmetics by trend score	Products are shown in descending trend score	High	Sprint-1
Customer (Web)	Filter by skin type	USN-2	As a customer, I can filter cosmetics based on skin type (dry, oily, etc.)	I can apply filters and see relevant products	High	Sprint-1
Customer (Web)	Compare Products	USN-3	As a customer, I can compare ratings, prices, and ingredients	Dashboard shows side-by-side product data	Medium	Sprint-2
Marketer	View Customer Insights	USN-4	As a marketer, I can view insights about customer preferences and trends	Tableau shows region-wise analytics	High	Sprint-1
Admin	Upload New Product Data	USN-5	As an admin, I can upload new cosmetic product datasets	New data is stored and used in dashboard	High	Sprint-2
Customer (Web)	Submit	USN-6	As a customer, I can rate and review a product	My review is visible and stored	Medium	Sprint-2

3.4 Technology Stack Technical

Architecture:-

SNO	Component	Description	Technology
1.	User Interface	Web UI for consumers and marketers	HTML, CSS, Bootstrap, JavaScript
2.	Application Logic-1	Filters, search & dashboard integration	Python or JavaScript
3.	Application Logic-2	Trend calculation logic	Python (Pandas/Numpy)
4.	Application Logic-3	Visualization rendering and export	Tableau Public
5.	Database	Store product data, trends, reviews	MySQL or Google Sheets
6.	Cloud Database	Hosting Tableau data source or CSV	Google Drive / Firebase
7.	File Storage	Store uploaded product images (if any)	Firebase Storage or local drive
8.	External API-1	Optional – cosmetic product API	Skincare API (if available)
9.	External API-2	Optional – social login (Google)	Google Auth API
10.	Machine Learning Model	Trend prediction (optional future feature)	(Future) Sentiment Analysis model
11.	Infrastructure (Server / Cloud)	Hosting & dashboard deployment	Heroku, Tableau Public, AWS EC2

Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Used for frontend/backend	Bootstrap, Flask, React, etc.
2.	Security Implementations	Protect users data & feedback	Google Auth, SHA-256, Firebase IAM
3.	Scalable Architecture	Can scale with new users/products	3-tier (frontend → backend → data)
4.	Availability	Always accessible with Tableau Public or Heroku	Tableau Public, load-balanced hosting
5.	Performance	Fast dashboard load, filtered views	Caching, Google Sheets connected to Tableau

4. PROJECT DESIGN

4.1 Problem Solution Fit

Template:-

Customer Segment

Young adults (18–35), especially women, who are skincare-conscious and follow beauty trends online. They actively browse cosmetic sites, follow influencers, and buy based on peer reviews and trends.

Problem Statement

Users are overwhelmed by too many cosmetic product options, uncertain reviews, and no clear insight into what actually works for their skin type and budget. Marketers also struggle to understand real-time customer trends.

Existing Alternatives

They rely on Instagram influencers, YouTube reviews, brand blogs, and e-commerce reviews, which are often biased, scattered, and not data-backed.

Your Solution

An interactive Tableau dashboard that displays real-time cosmetic product trends, filters by skin type, budget, popularity, and allows users/marketers to visualize data-driven insights.

Unique Value Proposition (UVP)

First-of-its-kind visual analytics tool for cosmetics trends that helps consumers make informed choices and gives marketers real-time behavioral insights.

Key Features / Functions

- Product filtering by skin type, price, and region
- Popular product trends shown in graphs
- Compare ratings and reviews visually
- Customer feedback tracking
- Marketer insights dashboard

User Benefits

Users can confidently choose the right cosmetics, avoid misinformation, and save money. Marketers can design better campaigns using real data.

Solution Validation

Validated through problem statements, user stories, and dashboards built in Tableau which showcase real-time filtering, review visualizations, and customer behavior tracking.

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:

CUSTOMER PROBLEM/OPPORTUNITY DISCOVERY CANVAS			
1. CUSTOMER SEGMENT(S) CS		6. BEHAVIOUR SB	
Young adults (19–30), especially women, who are skincare-conscious and fellow beauty influencers. These users want to stay updated on affordable, trending products and make confident choices based on skin type and genuine reviews.		<ul style="list-style-type: none">• Scroll through Instagram/YouTube for product recommendations• Search for best skincare products by skin type• Watch influencer reviews• Look for discount offers or trending charts• Submit or read reviews online	
3. TRIGGERS BEFORE / AFTER EM		7. BEHAVIOUR SL	
<ul style="list-style-type: none">• Find affordable, trending cosmetics suited to their skin type• Avoid fake or biased product reviews• Understand what others with similar needs are buying• Compare multiple products easily• Stay updated with current cosmetic trends		<p>A Your solution dashboard</p> <ul style="list-style-type: none">• A Tableau-powered dashboard that users:• View trending cosmetics by skin type, price and rating• See summarized real-user feedback• Get personalized recommendations	
5. CHANNELS OF BEHAVIOUR RE		8. PROBLEM ROOT CAUSE RE	
5.1. ONLINE YouTube, Instagram, Google search, beauty blogger e-commerce sites (e.g. Mykaa, Amazon)	5.2. BEHAVIOUR In-store visits, product trials in retail outlets, Discussions with friends	<p>A market is overloaded with similar trending.</p> <ul style="list-style-type: none">• View trending cosmetics by skin type, price, and rating• Compare multiple products in one place• See summarized real-user feedback• Submit their reviews and track new launches	
10. PROPOSAL: SOLUTION-FIT Cosmetic Insights – Navigating Cosmetics Trends and Consumer Insights with Tableau bridges the gap between overwhelming choices			

4.2 Proposed Solution Proposed Solution Template:

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Consumers are overwhelmed by the vast number of cosmetic products available online. There is a lack of a centralized, data-driven tool that allows users to compare trending cosmetics based on their skin type, budget, and real consumer insights. Marketers also lack access to real-time trend analytics.
2.	Idea / Solution description	The project proposes an interactive Tableau dashboard that lets consumers explore and filter cosmetic products by trend score, reviews, ingredients, skin type compatibility, and price. The dashboard also allows marketers to view consumer behavior, top-trending categories, and feedback patterns.
3.	Novelty / Uniqueness	Unlike static product lists or biased influencer reviews, this dashboard provides real-time data visualization and comparison of cosmetics. It empowers users to make informed decisions through verified insights and trend patterns. It's also personalized for skin type and budget — something few tools offer.
4.	Social Impact / Customer Satisfaction	This solution boosts consumer confidence by reducing the confusion and stress of online product choices. It also promotes transparency in cosmetic marketing. Marketers can better align their products
		with real needs, creating a win-win outcome..
5.	Business Model (Revenue Model)	Freemium Model: Users get free access to core features. Premium features include personalized recommendations, trend alerts, and deep analytics. Revenue can also come from sponsored product placements and B2B insights for cosmetic brands.
6.	Scalability of the Solution	The solution can scale across regions by integrating global cosmetic product data. New filters and dashboards can be added for haircare, fragrances, and wellness products. The platform can also evolve to include AI-based recommendations and multilingual support.

4.3 Solution Architecture

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.

KEY ASPECTS OF YOUR SOLUTION ARCHITECTURE

1. User Layer (Entry Point) ○

Users include:

- Cosmetic consumers: use filters to discover products
- Marketers: analyze trends and user behavior
- Interact via a simple, responsive web interface with embedded Tableau dashboard

2. User Interface (Frontend) ○ Technologies:

HTML, CSS, Bootstrap, JavaScript ○ Features:

- Filters: skin type, budget, brand, rating
- Search and comparison interface
- Embedded Tableau dashboards for data visuals

3. Application Layer (Backend) ○

Technologies: Python (Flask/Streamlit) or JavaScript (Node.js) ○ Functions:

- Pass user inputs (filters) to Tableau
- Handle login/auth (if used)
- Process and fetch data from review/product databases
- Optional: route feedback submission

4. Visualization Layer

(Dashboard) ○ Tool: Tableau Public or Tableau Server ○

Displays:

- Top trending cosmetic products
- Charts by skin type, rating, region, category
- Comparison visuals for price, review score, ingredients

5. Data Sources ○ Sources:

- Product Data: CSV / MySQL / Google Sheets
- Review Data: Customer ratings & feedback ○ Features:
- Structured datasets allow filtering and charting
- Can be updated regularly or live connected

6. Feedback Engine (Optional) ○

Collects product ratings/reviews from users ○ Stores in review repository ○ Feeds into Tableau to update user satisfaction visuals

7. Hosting & Storage ○ Tableau Public: for hosting dashboards ○

GitHub Pages / Heroku: for web app or frontend ○ Google Drive / Firebase: for storing files and datasets

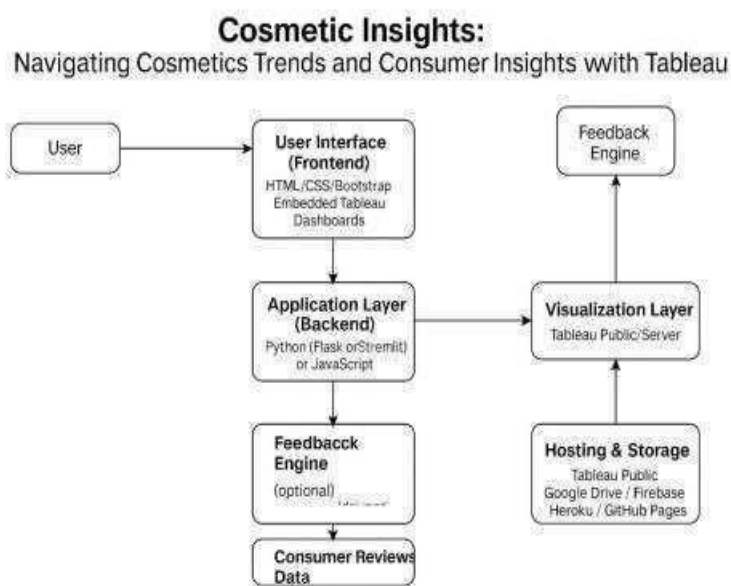
8. Data Flow ○ User → UI → Backend → Tableau → Visualization ○ Optionally, Feedback → Stored → Updates Dashboard

9. Scalability ○ Add more product datasets ○ Support multi-category expansion: skincare, makeup, fragrance ○ Add AI/ML trend prediction module in future

10. Security (Optional/Advanced)

- OAuth for secure login (Google, LinkedIn)
- Backend validation for data inputs and review authenticity

Solution Architecture Diagram



5. PROJECT PLANNING & SCHEDULING

5.1 Project Planning

Product Backlog, Sprint Schedule, and Estimation

Use the below template to create product backlog and sprint schedule

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register with email and password	2	High	Kanithi mouni Naga Sai Chandana
Sprint-1	Registration	USN-2	As a user, I receive a confirmation email upon registration	1	High	Kanithi mouni Naga Sai Chandana

Sprint-1	Login	USN-3	As a user, I can log in using my email and password	1	High	Kanithi mouni Naga Sai Chandana
Sprint-1	Dashboard (View products)	USN-4	As a user, I can view trending cosmetic products in the dashboard	3	High	Kanithi mouni Naga Sai Chandana
Sprint-1	Dashboard (Filters)	USN-5	As a user, I can filter products by skin type, trend score, and price	3	High	Kanithi mouni Naga Sai Chandana
Sprint-2	Product Comparison	USN-6	As a user, I can compare two or more products side-by-side	3	Medium	Kanithi mouni Naga Sai Chandana
Sprint-2	Feedback System	USN-7	As a user, I can rate and write reviews for product	3	Medium	Kanithi mouni Naga Sai Chandana
Sprint-2	Admin Upload	USN-8	As an admin, I can upload new product data	2	Medium	Kanithi mouni Naga Sai Chandana
Sprint-3	Marketer Dashboard	USN-9	As a marketer, I can view consumer insight and product trends	3	Medium	Kanithi mouni Naga Sai Chandana

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	5	2 Days	20 June 2025	21 June 2025	5	21 June 2025
Sprint-2	5	1 Day	22 June 2025	22 June 2025	5	22 June 2025
Sprint-3	5	1 Day	23 June 2025	23 June 2025	5	23 June 2025
Sprint-4	5	1 Day	24 June 2025	24 June 2025	5	24 June 2025
Sprint-5	5	1 Day	25 June 2025	25 June 2025	5	25 June 2025

Velocity:-

Average Velocity = $25 / 6 = 4.166... \approx 4.2$ story points/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](#).

However, burn down charts can be applied to any project containing measurable progress over time



6. FUNCTIONALAND PERFORMANCE TESTING:-

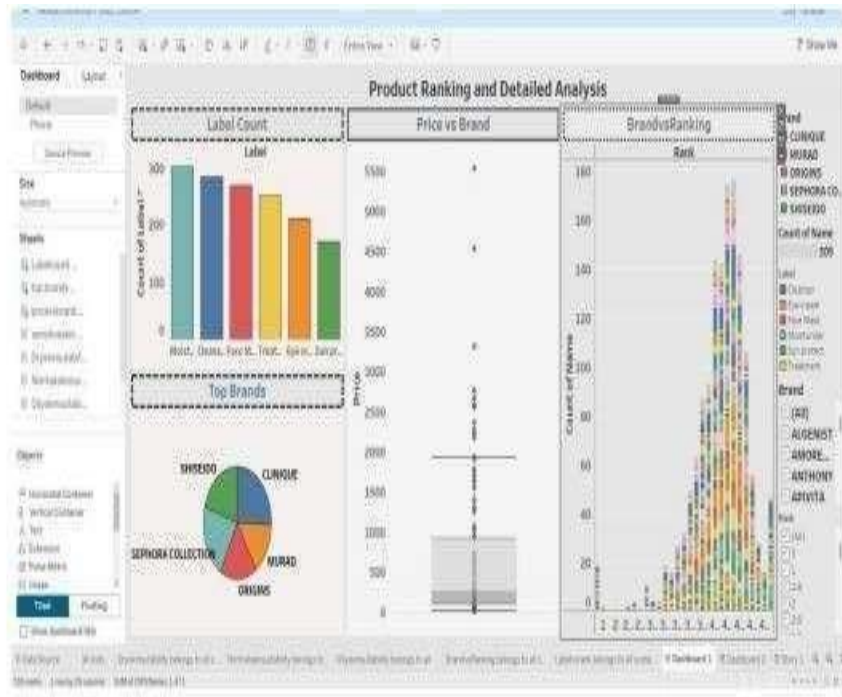
6.1 Performance Testing Model

Performance Testing: -

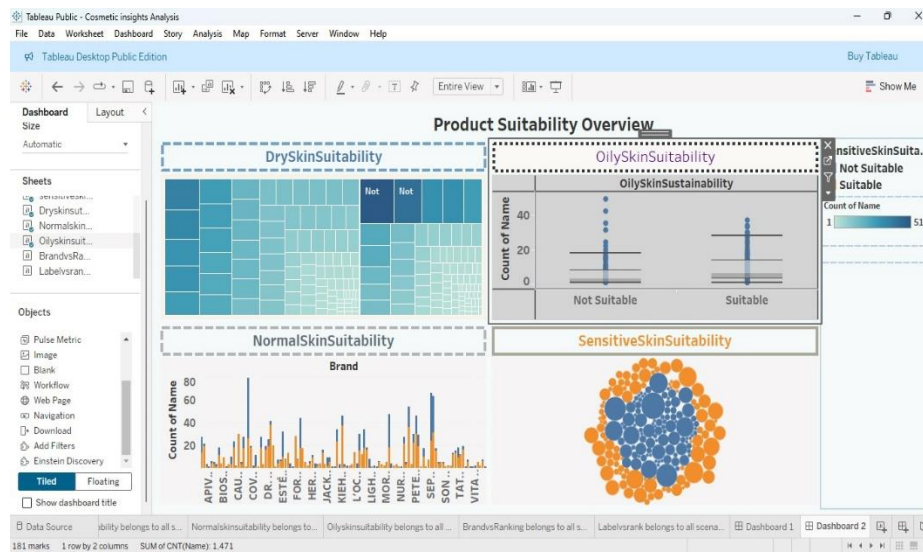
Project team shall fill the following information in model performance testing template

S.No	Parameter	Screenshot / Values
1.	Data Rendered	Data from cosmetics.xlsx loaded successfully in Tableau. Data included product Name, Brand, Price, Ingredients, Label, Skin Suitability metrics.
2.	Data Preprocessing	Cleaned ingredient data using Excel for word cloud visualization. Removed nulls and merged cells for clarity. Created a secondary cleaned dataset.
3.	Utilization of Filters	Used filters in dashboards to select by Skin Type (Dry, Oily, Normal, Sensitive), Brand, and Label. Filtered data for ranking and category views.
4.	Calculation fields Used	Created calculated fields for Suitability status (e.g., IF [Dry] = 1 THEN "Suitable" ELSE "Not Suitable" END) and for Label vs Rank.
5.	Dashboard design	No of Visualizations / Graphs - Label Count - Top Brands - Price vs Brand - Sensitive Skin Suitability - Normal Skin Suitability - Oily Skin Suitability - Dry Skin Suitability - Brand vs Ranking -Label vs Ranking
6	Story Design	No of Visualizations / Graphs - 9- Organized in Tableau Storyboard with captions per chart; used for presenting key insights in scenario-based flow.

Screenshots of Dashboard 1 with Filters :

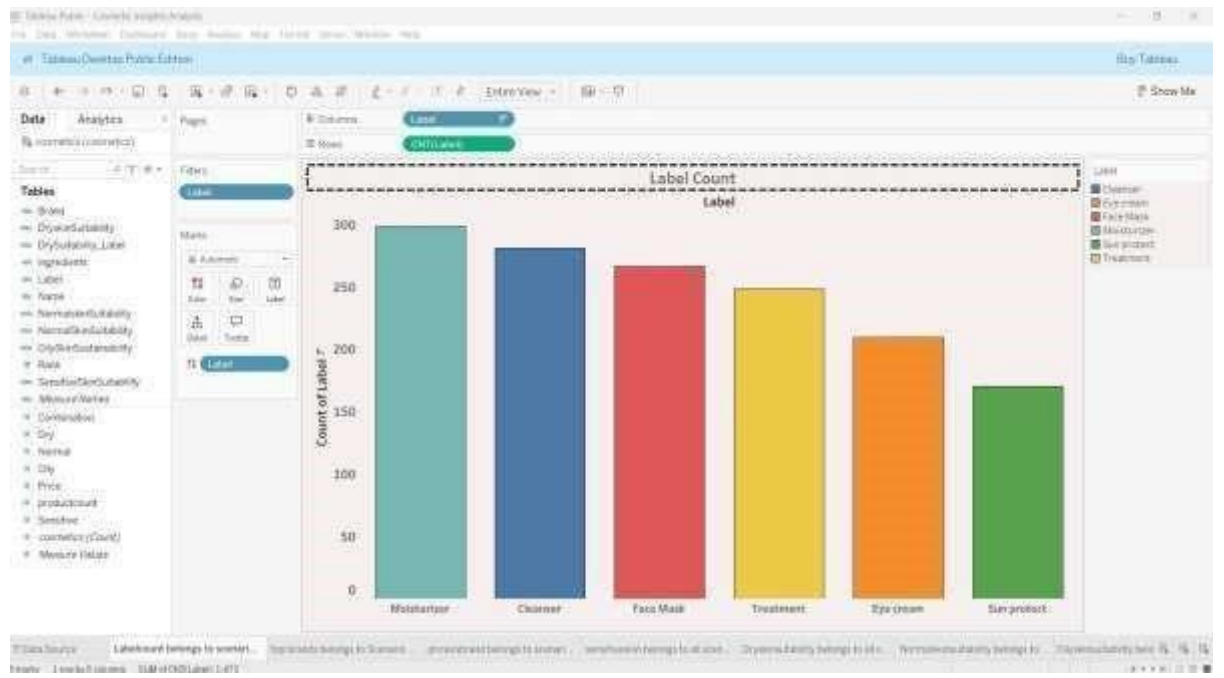


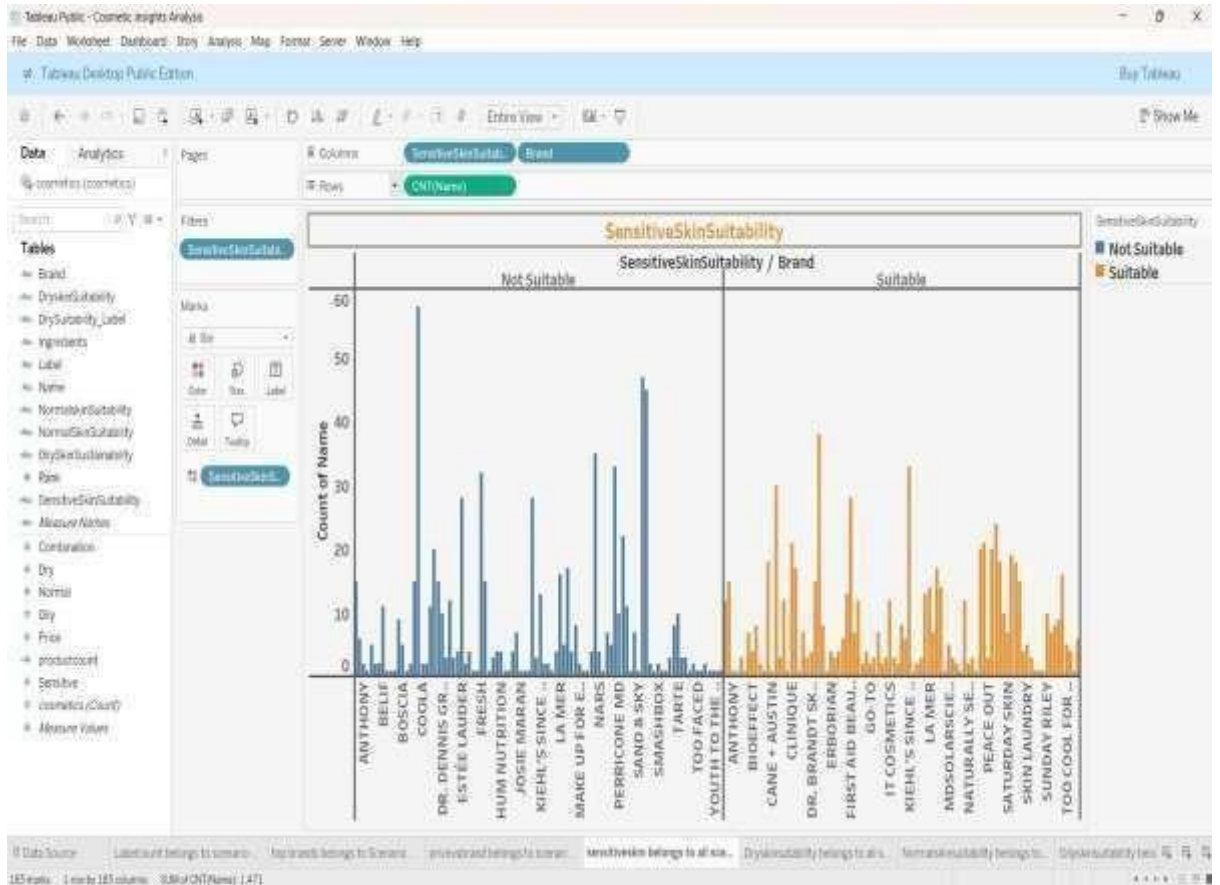
Screenshot of Dashboard 2 with Filters:

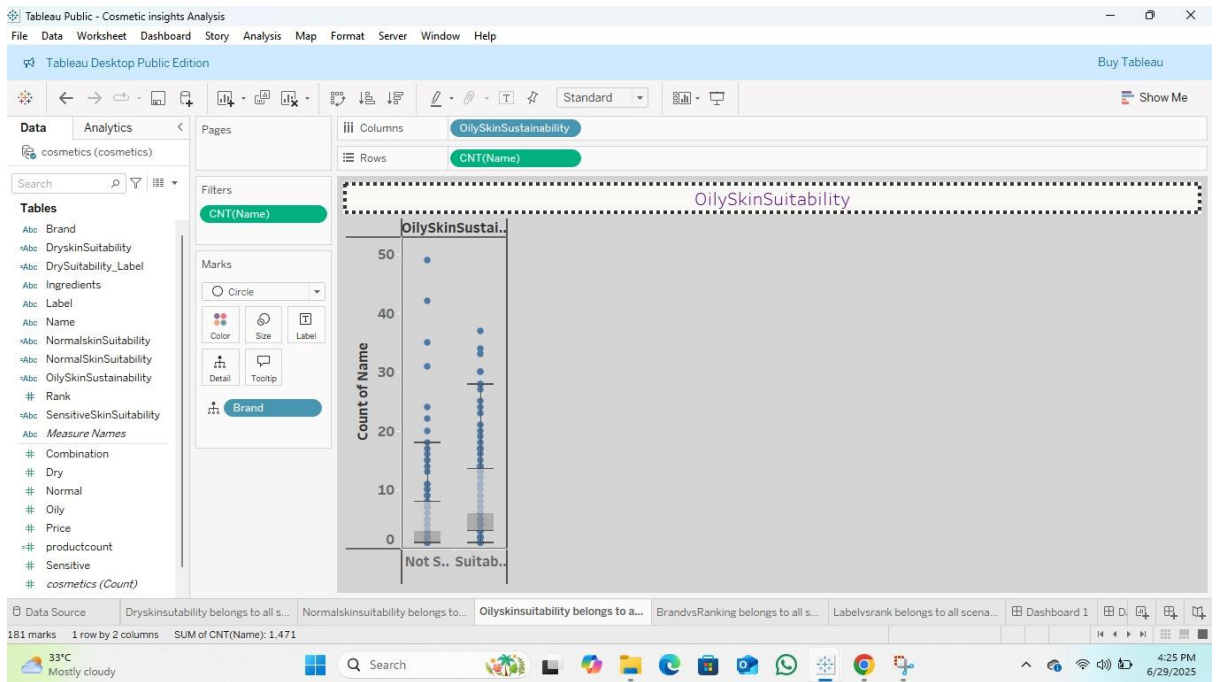
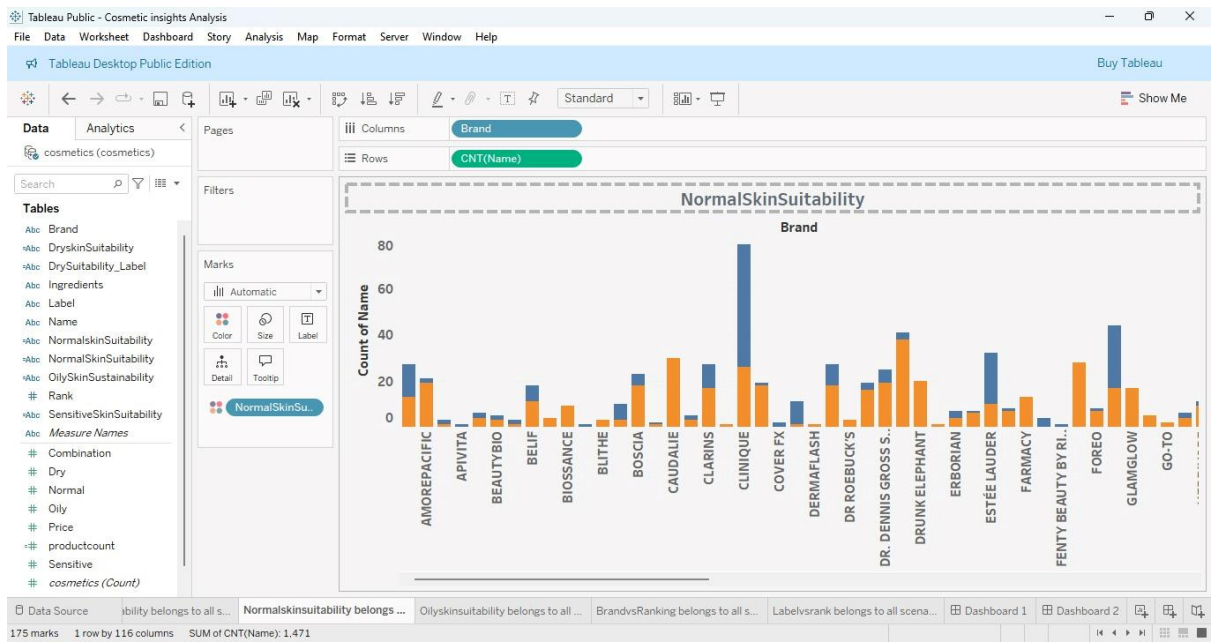


7. RESULTS :-

7.1 Output Screenshots Scenarios 1 and 3:

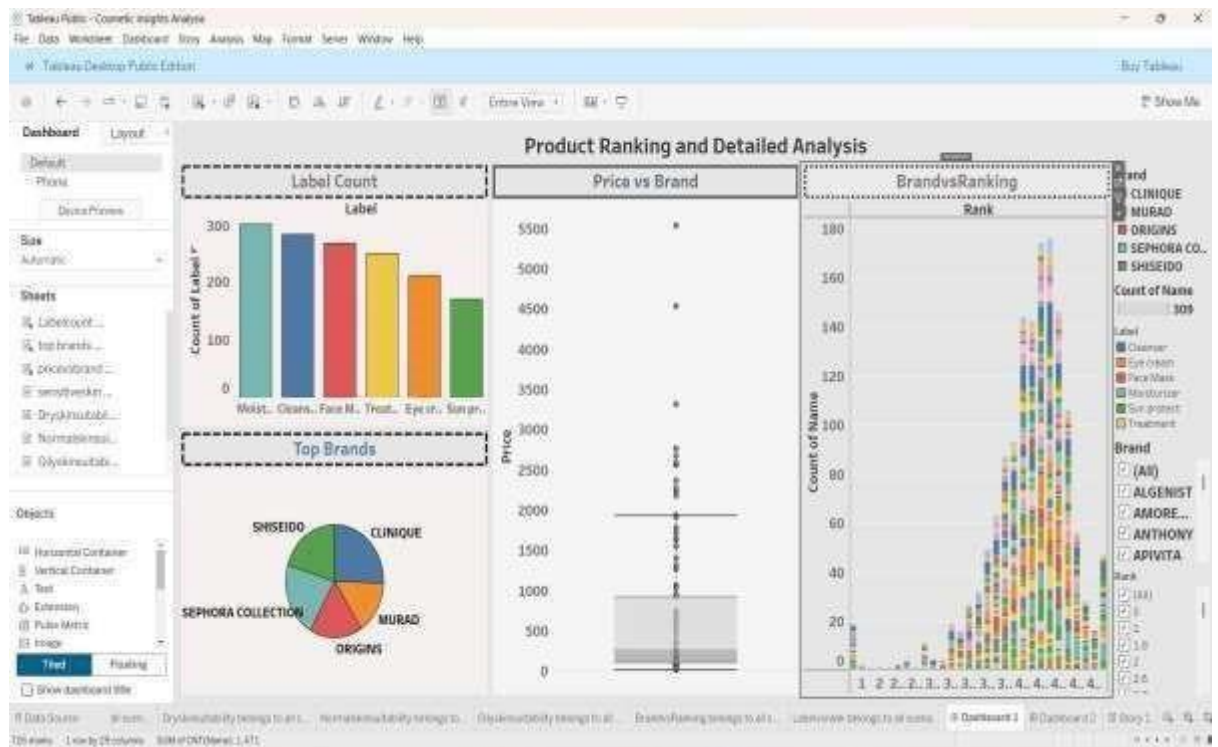








Dashboard 1:



Dashboard 2:

1. Interactive Dashboards

Users can filter data by brand, skin type, label, and more to view personalized insights in real time.

2. Data-Driven Decision Making

Helps cosmetic companies understand consumer preferences, product trends, and brand performance to make informed marketing and R&D decisions.

3. Visual Clarity

Tableau's clean and dynamic visuals make complex data easier to understand for both technical and non-technical users.

4. Skin-Type Suitability Analysis

Offers specific insights for users with dry, oily, normal, or sensitive skin — a valuable differentiator for product targeting.

5. Ingredient Trend Discovery

The Word Cloud reveals commonly used ingredients, helping users track popular or overused components.

6. Scalable Visualization

The system can be expanded with new data (sales, reviews, etc.) for deeper future analysis.

Disadvantages:-

1. Static Dataset

Since the data used is not real-time or continuously updated, insights may become outdated over time.

2. Manual Preprocessing Needed

The ingredients column required cleaning and restructuring outside Tableau (in Excel), which adds effort and dependency.

3. Limited Predictive Capabilities

This version focuses on visual reporting; it doesn't yet include machine learning or trend forecasting.

4. Tool Dependency

Requires Tableau software (or Tableau Public) for viewing and interaction — which may not be accessible to all users.

5. No User Feedback Loop

Currently lacks a direct mechanism to collect feedback or validate insights with real consumer responses.

9.CONCLUSION : -

The project “Cosmetic Insights – Navigating Cosmetics Trends and Consumer Insights with Tableau” successfully demonstrates the power of data visualization in the beauty industry. By leveraging Tableau, we transformed a static cosmetic product dataset into meaningful and interactive dashboards that highlight product distribution, brand performance, pricing strategies, ingredient usage, and skin-type suitability.

The visualizations not only simplify complex data but also support evidence-based decision-making for brands, marketers, and consumers. From ingredient trends to suitability scores for different skin types, the dashboards provide a complete view of cosmetic product behavior and market dynamics.

Overall, the project meets its goals of making data accessible, insightful, and actionable through effective visual storytelling.

10.FUTURE SCOPE:-

1. Integration of Real-Time Data

The dashboard can be enhanced by connecting to live data sources such as sales databases, e-commerce APIs, or review platforms for continuous updates.

2. Sentiment Analysis from Customer Reviews

By incorporating text analytics or NLP, the project can analyze consumer sentiment from online product reviews to better understand user satisfaction and concerns.

3. Recommendation Engine

Using user preferences and suitability scores, the system can be extended to recommend the most appropriate products for different skin types or concerns.

4. Mobile and Web Embedding

The dashboards can be embedded into brand websites or mobile apps, providing real-time insights to both internal teams and customers.

5. Advanced Predictive Analytics

Machine learning models can be added to predict emerging trends, ingredient effectiveness, or customer demand across categories and regions.

6. User Feedback Integration

Enabling feedback capture directly within dashboards would improve insight validation and help refine product development strategies.

7. Geographic Analysis

By including location-based data, brands can visualize regional trends and optimize marketing or stocking strategies accordingly.

11. APPENDIX:-

- **Dataset Link :** <https://www.kaggle.com/datasets/kingabzpro/cosmetics-datasets>
- **GitHub & Project Demo Link :-**

Git Hub Link:-

<https://github.com/Rupa-180/Cosmetic-Insights-Navigating-Cosmetics-Trends-and-ConsumerInsights-withTableau>