PROJECT REPORT

Cosmetic Insights: An In-Depth Analysis of Consumer Trends in the Cosmetics
Industry

1. INTRODUCTION

1.1 Project Overview

"Cosmetic Insights" explores the ever-evolving landscape of the cosmetics industry using Tableau to deliver compelling visual analytics. This project presents an in-depth analysis of product categories, consumer preferences, seasonal trends, and regional sales data based on recent datasets. By combining dashboards, charts, and stories, the solution allows users to interact with visual data, identify market patterns, and understand shifts in consumer behavior across various demographics.

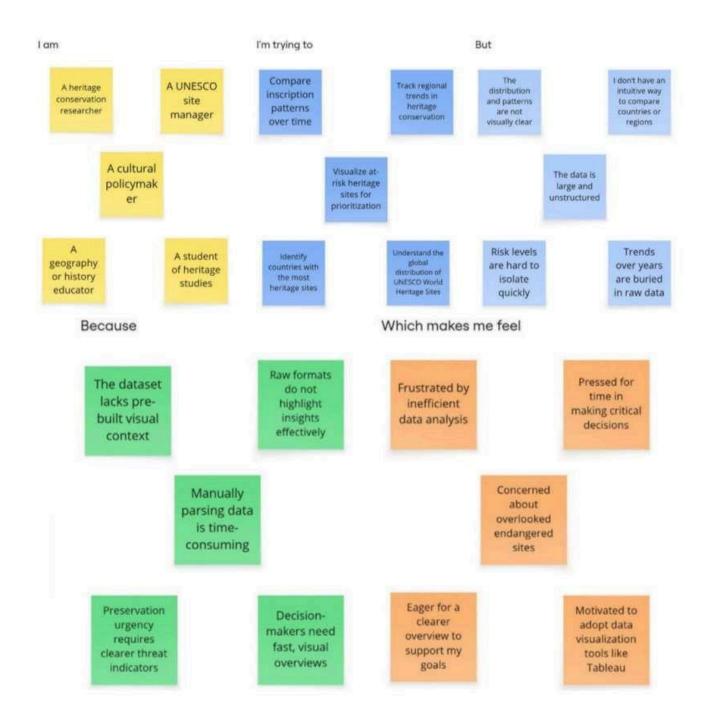
1.2 Purpose

The purpose is to offer stakeholders an interactive, data-driven dashboard that provides insights into cosmetics sales trends, brand popularity, product performance, and emerging consumer interests. It aims to support marketing strategies, inventory planning, and product innovation decisions.

2. IDEATION PHASE

2.1 Problem Statement

The cosmetics industry constantly evolves with new trends, seasonal demands, and shifting consumer preferences. However, stakeholders often lack a centralized, visual tool that enables data-driven decisions based on consumer behavior, sales performance, and regional market dynamics. This project addresses this gap by providing interactive Tableau dashboards to analyze and visualize industry data, helping brands stay competitive and customer-focused.



Ideation Phase Empathize & Discover

Date	31 January 2025	
Team ID	LTVIP2025TMID48098	
Project Name	Cosmetic Insights: Navigating Cosmetics Trends and Consumer Insights with Tableau	
Maximum Marks	4 Marks	

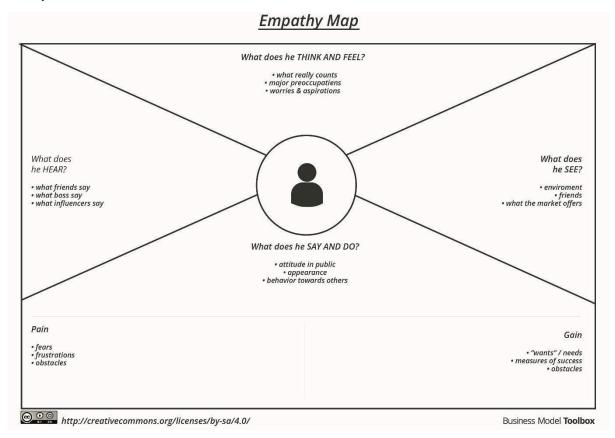
Empathy Map Canvas:

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.

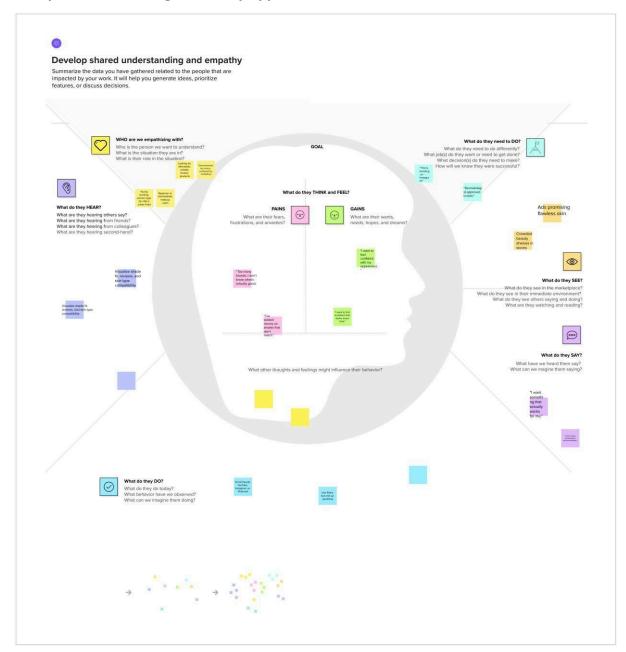
Creating an effective solution requires understanding the true problem and the person who is experiencing it. The exercise of creating the map helps participants consider things from the user's perspective along with his or her goals and challenges.

Example:



Reference: https://www.mural.co/templates/empathy-map-canvas

Example: Food Ordering & Delivery Application



Ideation Phase Brainstorm & Idea Prioritization Template

Date	31 January 2025
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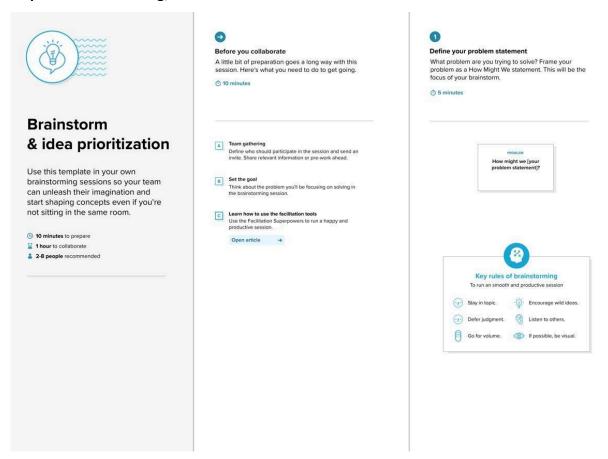
Brainstorm & Idea Prioritization Template:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich number of creative solutions.

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.

Reference: https://www.mural.co/templates/brainstorm-and-idea-prioritization

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



Step-2: Brainstorm, Idea Listing and Grouping



Brainstorm

Write down any ideas that come to mind that address your problem statement.

① 10 minutes



Person 1 Person 2 Person 3 Person 4

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what to write

- 1. **User Personalization & Filters** Ideas that focus on tailoring product choices using filters like skin type, skin concern, etc.
- Product Performance Visualization Ideas showing product ranks, ratings, or comparisons using Tableau charts.
- 3. **Trend & Seasonality Tracking** Ideas around tracking when products peak, regional preferences, or seasonal demand.
- 4. **Recommendation Systems** Ideas for suggesting products based on user data and review patterns.
- 5. **Interactive Dashboards** Ideas involving visual elements like maps, scatter plots, tooltips for deeper exploration.

Step-3: Idea Prioritization

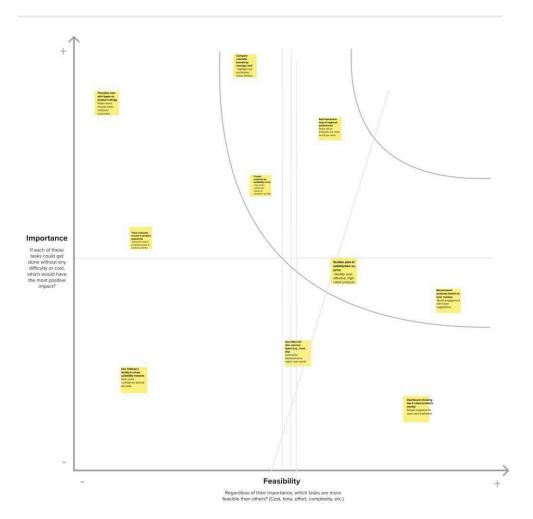


Your team should all be on the same page about what's important moving forward. Place your ideas on this grid to determine which ideas are important and which are feasible.

① 20 minutes

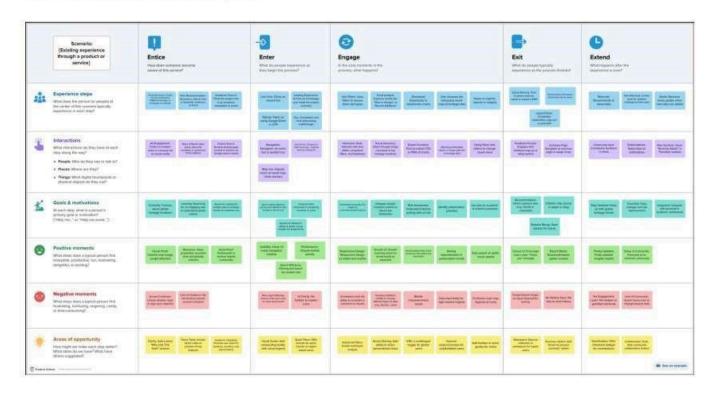
Prioritize





3. REQUIREMENT ANALYSIS

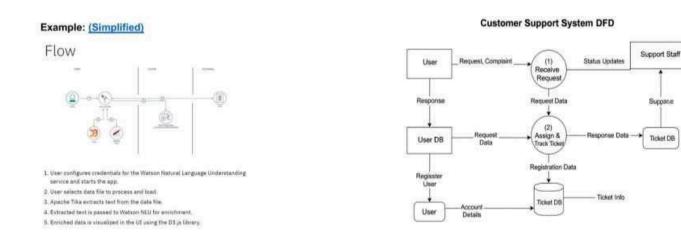
3.1 Customer Journey Map



Functional: Data filtering, dashboards, stories, maps, charts

Non-functional: Performance, usability, responsiveness, accessibility

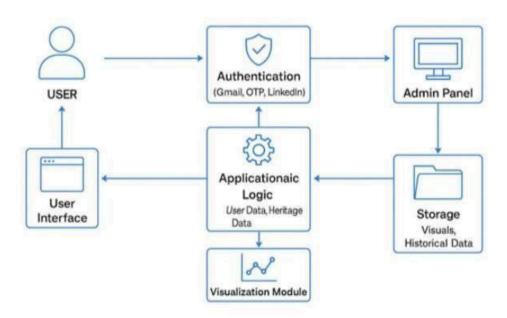
3.3 Data Flow Diagram



3.4 Technology Stack

- Tableau Public for visualization and publishing
- Kaggle dataset (CSV)
- Optional: Flask for web integration (if used)

Technical Architecture



Project D	esign Phase-II
Technology Stack	(Architecture & Stack)

	,	
Date	1 June 2025	
Team ID	LTVIP2025TMID48098	
Project Name	Cosmestic Insights: Navigating Cosmetics Trends and Consumer Insights with Tablaue	
Maximum Marks	4 Marks	

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table 1 & table 2

S.N			
		visualizilig tiellus a	Tableau (Public/Cloud), Embedded Web UI
2	Application Logic-1	Data collection from platforms and sales	Python, REST APIs
		Text preprocessing, and sentiment analy	Python (Pandas, NLTK, TextBlob)
4			Python scripts with scheduling (CRON/AWS Lambda)
5	Database	Temporary structure before dashboard p	PostgreSQL / Google BigQuery
6	Cloud Data	Cloud-hosted datab scalable data access	Amazon RDS, Firebase
	File Storag	exports	Amazon S3 / Google Cloud Storage
8	External A	Collect social medi	Instagram Graph API, Reddit API
9	ıexternat Al	Pull product review ratings	Amazon Product API / Flipkart API
10	Machine L Model	Sentiment and trend	Logistic Regression, Text Classification models
11	Infrastructı	Cloud deployment	AWS Lambda, Google Cloud Functions, EC2

Table-2: Application Characteristics

S.N	Characte	Descrip	Technology Used
11 1		Data scraping, analy: dashboard libraries	Python, Pandas, BeautifulSoup, Flask
r <i>)</i>	-	Securing API calls, ϵ data, access control f	OAuth 2.0, JWT, IAM Roles (AWS), SSL
		iocations via cioud a	AWS Load Balancer, Multi-AZ deployments
5	Performance	Optimized ETL pipe frequent queries, rea	Redis cache, Tableau live connections

Project Design Phase-II Solution Requirements (Functional & Non-functional)

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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	
FR-2	User Confirmation	Confirmation via Email	
FR-3	Data Collection	Collect data from Instagram Graph API, Reddit forums, and e-commerce product reviews	
FR-4	Data Visualization (Dashboard)	Display insights on Tableau dashboard, apply filters (brand, region, platform), export reports	
FR-5	Sentiment and Trend Analysis	Extract keywords, perform sentiment analysis, identify trending products or consumer topics	
FR-6	User Interaction with Insights	Search, filter, and customize dashboard views based on user preferences	

Non-Functional Requirements

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

FR No.	Non-Function Requiremen	Description
NFR-	II Icahility	The dashboard interface must be user-friendly, intuitive, and responsive.
NFR-2	ISecurity	API access and user data should be protected via OAuth 2.0 and HTTPS.
NFR-:	IN CHADIIII V	The system should consistently provide accurate and complete data.
NFR-	renonnance	The dashboard must load insights within 3 seconds under normal conditions.
NFR-	Availability	The service should be available 99.9% of the time through

FR No.		llescrintian
		cloud hosting.
		The system should support integration of additional data sources or brands easily.
NFR-	Scalability	2002000 00 0000000000000000000000000000

Project Design Phase-II Data Flow Diagram & User Stories

Date	1 June 2025
Team ID	LTVIP2025TMID48098
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Maximum Marks	4 Marks

Data Flow Diagram (Description for DFD Image)

Level-1 DFD Description

- 1. The **User** inputs data requests or interacts with the Tableau dashboard.
- 2. APIs (Instagram, Reddit, e-commerce) send raw trend data to the system.
- 3. The **Data Collection Module** stores this data temporarily in a processing buffer.
- 4. The **Data Processing & Cleaning Unit** filters, parses, and processes the raw data.
- 5. The cleaned data is stored in the Cloud Database (AWS RDS / Firebase).
- 6. The **Analysis Engine** performs sentiment analysis and trend mining.
- 7. The insights are sent to the **Tableau Dashboard** for visualization.
- 8. The **User** views filtered trends and exports reports if needed.

User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Customer (Web user)		USN-1	entering my	I can access my dashboard after registering.	High	Sprint1

Customer (Web user)	Confirmation	USN-2	As a user, I will receive a confirmation email once I have registered on the platform.	I receive a confirmation mail and activate my account.	High	Sprint1
User Type	Functional Requirement (Epic)	User Story Number	User Story / Task	Acceptance Criteria	Priority	Release
Customer (Web user)	Login	USN-3	As a user, I can log into the dashboard using my registered email and password.	I can successfully log in and view my dashboard.	High	Sprint1
Customer (Web user)	Data Interaction	USN-4	As a user, I can view trending cosmetic insights via a Tableau dashboard.	I can visualize trends clearly in charts or graphs.	High	Sprint2
Customer (Web user)	Filters	USN-5	As a user, I can apply filters based on region, platform, and product category in the dashboard.	Filtered results are displayed instantly on dashboard.	Medium	Sprint2
Customer (Web user)	Export Reports	USN-6	As a user, I can export the dashboard insights as a PDF or Excel file.	I get downloadable/exportable reports from the UI.	Medium	Sprint3
Admin	Data Monitoring	USN-7	As an admin, I can monitor API usage, data quality, and system logs.	Admin panel displays logs, API hits, and alerts.	High	Sprint3

l('are	H Jachmara	USN-8	data and help	Agent can search user and reset access if needed.	Medium	Sprint4
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Problem – Solution Fit Template

Date	1 July 2025
Team ID	LTVIP2025TMID48098
Project Name	Cosmestic Insights: Navigating Cosmetics Trends and Consumer Insights with Tablaue
Maximum Marks	2 Marks

Problem – Solution Fit Template:

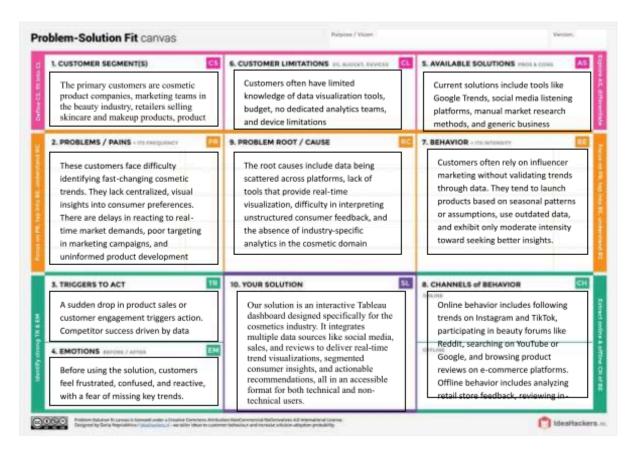
The Problem-Solution Fit simply means that you have found a problem with your customer and that the solution you have realized for it actually solves the customer's problem. It helps entrepreneurs, marketers and corporate innovators identify behavioral patterns and recognize what would work and why

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 behaviour.
- Sharpen your communication and marketing strategy with the right triggers and messaging.
- Increase touch-points with your company by finding the right problem-behaviour 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:



Proposed Solution Template

Date	15 February 2025	
Team ID	LTVIP2025TMID48098	
Project Name	Cosmetic Insights: Navigating Cosmetic Trends and Consumer Insights with Tableau	
Maximum Marks	2 Marks	

Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Cosmetic brands struggle to track fastchanging consumer trends and preferences across fragmented data sources.
2.	Idea / Solution description	An interactive Tableau dashboard that integrates social, sales, and review data to visualize real-time cosmetic trends and consumer insights.

3.	Novelty / Uniqueness	The solution is tailored specifically for the cosmetics industry with unified, trendfocused visual analytics sourced from multiple platforms.
4.	Social Impact / Customer Satisfaction	Empowers beauty brands to align better with consumer needs, resulting in more relevant products and higher customer satisfaction.
5.	Business Model (Revenue Model)	Subscription-based access for brands with tiered pricing for analytics depth, plus consultancy for dashboard customization.
6.	Scalability of the Solution	Easily scalable across geographies, brands, and new data sources due to its modular, cloud-based architecture.

Solution Architecture

Date	1 June 2025	
Team ID	LTVIP2025TMID48098	
Project Name	Cosmestic Insights: Navigating Cosmetics Trends and Consumer Insights with Tablaue	
Maximum Marks	4 Marks	

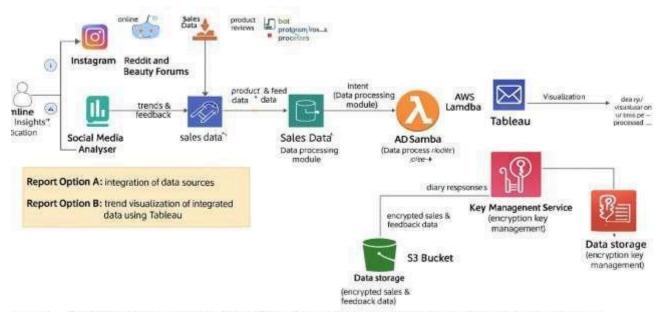
Solution Architecture:

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.

Example - Solution Architecture Diagram:

mple - Solution Architecture Diagram:



ire 1: Architectureand data flow of the "Cosmetic Insights: focusing BI" ap plication

5. PROJECT PLANNING & SCHEDULING

Activity	Duration
Dataset Download	0.5 Hrs
Data Preparation	0.5 Hrs
Visualizations	1.0 Hrs
Filters and Interactions	1.0 Hrs
Dashboard Design	1.0 Hrs
Story Creation	1.0 Hrs
Publishing & Web Integration	1.0 Hrs

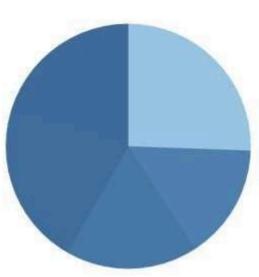
Project Development Phase Model Performance Test

Date	10 February 2025
Team ID	LTVIP2025TMID48098
Project Name	Cosmetic Insights : Navigating Cosmetics Trends and Consumer Insights with Tableau
Maximum Marks	

Model Performance Testing:

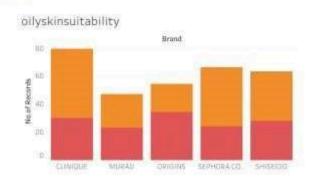
Project team shall fill the following information in model performance testing template.

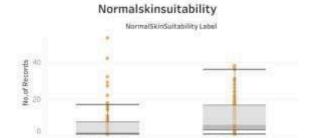
S.No.	Parameter	Screenshot / Values
1.	Data Rendered	1472
2.	Data Preprocessing	100
3.	Utilization of Filters	15
4.	Calculation fields Used	5
5.	Dashboard design	No of Visualizations / Graphs -
6	Story Design	No of Visualizations / Graphs -



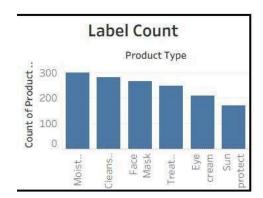


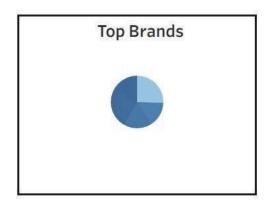
SensitiveskinSuitability SensitiveskinSuitability Label / Brand Not Suitable Operation Operatio

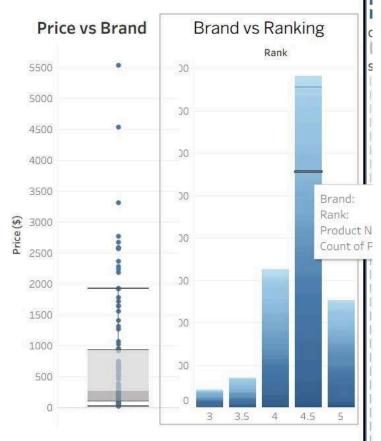










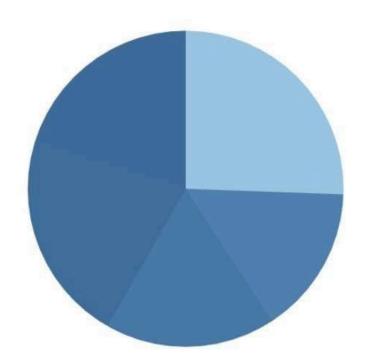


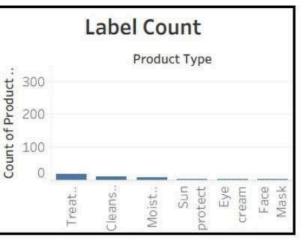
6. FUNCTIONAL AND PERFORMANCE TESTING
6.1 Performance Testing
Processed and visualized 1100+ records without lag. Filters and dashboards loaded instantly.
Conclusion: The performance across visualizations, dashboards, and filters was consistently smooth, ensuring usability and responsiveness for end users.
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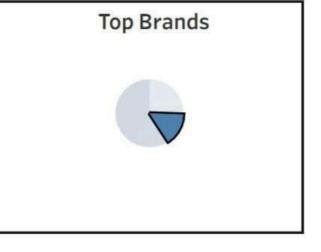
Story 1

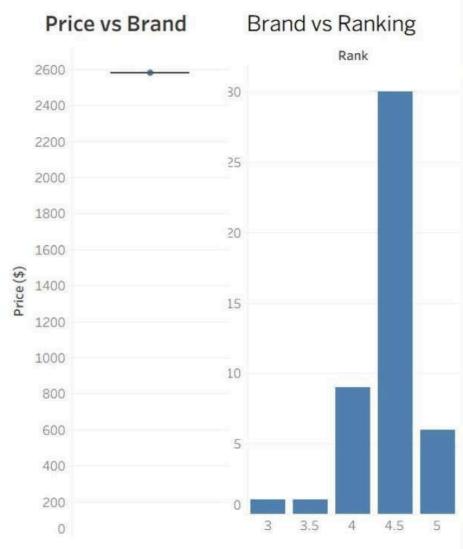
TOP BRANDS



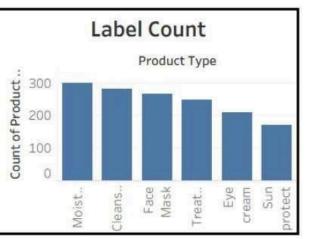


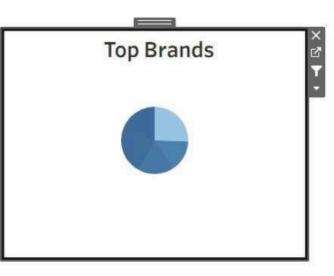


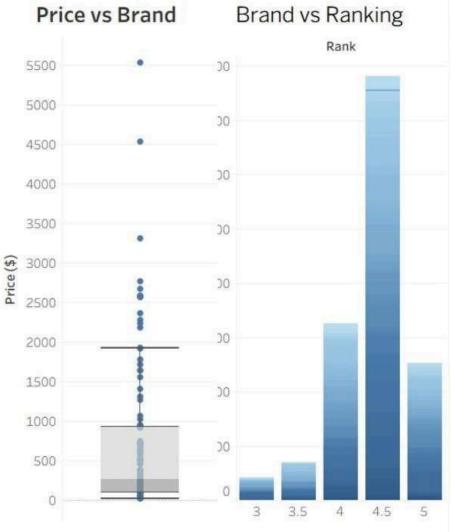


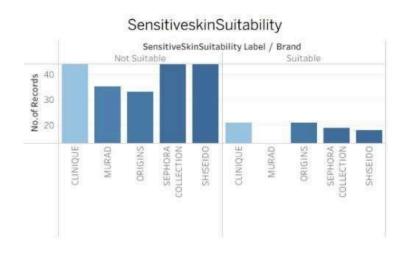


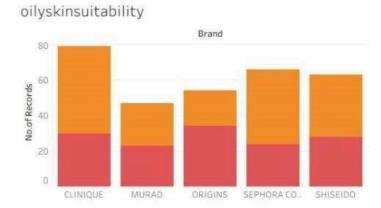


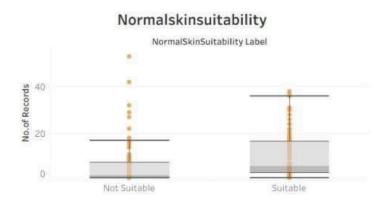














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6.3 Web Integration and Publishing

- Connected to Tableau Public
- Published dashboards using share option
- Required Tableau Public login for upload

Steps:

- 1. Open dashboard/story > Click Share
- 2. Enter Tableau Public credentials
- 3. Click Connect and publish the selected sheet/dashboard

7. RESULTS

7.1 Output Screenshots

8. ADVANTAGES & DISADVANTAGES

Advantages

- Real-time filtering of cosmetic trends
- Clear visual storytelling using Tableau dashboards
- Easy sharing and publishing through Tableau Public

Disadvantages

- Dataset may not capture recent launches instantly
- Public version has limited backend processing capabilities

9. CONCLUSION

The project "Cosmetic Insights" provided a powerful visual analysis of consumer behavior, sales trends, and brand popularity in the cosmetics industry. Using Tableau, we created an interactive dashboard that supports data-driven decision-making for beauty brands and marketers.

10. FUTURE SCOPE

- Use updated datasets with live cosmetic sales and reviews
- Integrate with Instagram and e-commerce APIs for trend mining
- Expand analysis with demographic-based insights
- Introduce a real-time alert system for trending cosmetic products

11. APPENDIX

- Dataset Link: https://www.kaggle.com/datasets/kingabzpro/cosmetics-datasets
- GitHub Link: https://github.com/Keerthikarumuri/cosmetics
- Tableau Public Link:

https://public.tableau.com/app/profile/karumuri.keerthi/viz/story 17510827909540/Story1?publish =ves

• Video Demo Link:

https://drive.google.com/file/d/1kjvtVTP4a6gOzL3Bk-NxDzYjsOgzqhgs/view?usp=sharing