Final Project Report

1. Introduction:

Navigating the cosmetics landscape requires understanding both emerging trends and consumer behaviours. This introduction aims to equip you with insights into the evolving world of cosmetics, focusing on key trends and consumer preferences to help you make informed decisions.

1.1. Project overviews:

This project, "Cosmetic Insights: Navigating Cosmic Trends and Consumer Insights," aims to explore and understand the evolving beauty and cosmetics industry, focusing on emerging trends and consumer behaviour in the Adoni, Andhra Pradesh context, with a particular focus on the Indian market's growth and unique characteristics.

1.2. Objectives:

- To identify and analyze what consumers desire in cosmetic products, including specific ingredients, formulations, and product types.
- To decipher consumer buying behaviors and the factors influencing their purchasing decisions.
- To monitor and predict emerging trends in the beauty industry, such as shifts towards natural ingredients, sustainable packaging, or specific product categories.
- To stay informed about evolving consumer preferences and adapt to rapid changes in the market.
- To use consumer feedback and market analysis to guide the development of new cosmetic products that meet the needs and desires of the target audience.
- To ensure that new product launches align with current market demands.
- To assess the strengths and weaknesses of competitors, their product offerings, and their marketing strategies.

2. Project Initialization and Planning Phase:

To effectively initialize and plan a project focused on "Cosmetic Insights: Navigating Cosmetic Trends and Consumer Insights", you need to define clear objectives, identify key stakeholders, conduct thorough research, and develop a detailed project plan.

2.1. Define Problem Statement:

Problem Statement	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	A consumer looking for eco-friendly beauty products.	Identity genuinely suitable cosmetic products.	Many brands use misleading marketing (greenwashing).	Labels and certifications are inconsistent across brands.	Frustrated and unsure about my purchase decisions.
PS-2	A skincare enthusiast trying to find the best products for my skin.	Discover skincare products suited to my skin type.	There are too many options with conflicting reviews.	Product ingredients and effectiveness vary widely.	Overwhelmed and hesitant to try new products.
PS-3	A marketing professional at a beauty brand.	Understand consumer trends and product performance	The market data is scattered and hard to analyze.	Consumer preferences change rapidly across demographics.	Challenged in making data-driven marketing decisions

2.2 Initial Project Planning

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

1. Project Overview	
Objective	To analyze and visualize cosmetic industry trends using Tableau, providing insights into consumer behaviour, product performance, and emerging beauty trends.
Scope	- Collect and analyze data from beauty product sales, social media trends, and customer reviews. - Develop interactive dashboards in Tableau to visualize key cosmetic industry insights. - Enable brands and retailers to make data-driven decisions.
Problem Statement	
Description	The cosmetic industry is constantly evolving, with shifting consumer preferences, influencer impact, and changing beauty standards. Businesses lack clear, data-driven insights into market trends.
Impact	Without accurate insights, brands struggle to meet consumer expectations, leading to missed market opportunities and ineffective marketing strategies.
Proposed Solution	
Approach	- Gather historical and real-time cosmetic industry data from sources like sales reports, social media, and surveys. - Clean and preprocess data using Python and Tableau Prep. - Design interactive Tableau dashboards for analyzing product performance, customer preferences, and emerging beauty trends.

Key Features	- **Trend Analysis:** Identify popular cosmetic products and emerging beauty trends. - **Consumer Insights:** Understand customer demographics and buying patterns. - **Market Segmentation:** Analyze brand performance across different regions and customer groups. - **Interactive Dashboards:** Provide real-time visualizations for better decision-making.

Resource Requirements:

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	e.g., 2 x NVIDIA V100 GPUs
Memory	RAM specifications	16 GB
Storage	Disk space for data, models, and logs	2 TB SSD
Software		
Frameworks	Python frameworks	Flask, Tableau, Python (Pandas, NumPy)
Libraries	Additional libraries	Tableau Prep, scikit-learn, Tableau Desktop, spyder
Development Environment	IDE, version control	Jupyter Notebook, Git, spyder
Data		
Data	Source, size, format	Kaggle dataset, 1M+ consumer reviews, CSV

Data Cleaning Tools	Tools for pee-processing	Tableau Prep, Python (Pandas)
Data Types	Structured/unstructured data	sales figures, social media trends

2.3 Data Collection and Preprocessing Phase:

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members	Sprint Start Date	Sprint End Date (Planned)
Sprint-1	Data Collection and Extraction	CINTCWT-2	Downloading the dataset	2	High	Patan Nasreen	14 /3/2025	16 /3/2025
Sprint-2	Data Preparation	CINTCWT-4	Explanation video Links	1	Medium	Ginkala Anusree	17/3/2025	18 /3/ 2025
Sprint-3	Data Visualisations	CINTCWT-6	No. Of unique visualizations	2	Low	Uk Anitha	18 /3/2025	22 /3/2025
Sprint-3	Data Visualisations	CINTCWT-7	Visualizations	1	High	Patan Nasreen	18 /3/2025	22 /3/2025
Sprint-4	Dashboard	CINTCWT-10	Product Suitability Overview	2	Medium	B Rajeshwari	17 /3/2025	19 /3/2025
Sprint-4	Dashboard	CINTCWT-9	Responsive And Design of Dashboard	2	Medium	B Rajeshwari	17 /3/2025	19 /3/2025
Sprint-5	Story	CINTCWT-12	No. Of Scenes of Story	1	High	B Rajeshwari	18 /3/2025	20 /3/2025
Sprint-6	Performance Testing	CINTCWT-14	No of Visualizations/Graphs	2	Medium	Ginkala Anusree	18 /3/2025	20 /3/2025

Sprint-7	Web Integration	CINTCWT-16	Go to dashboard/Story, Click on share button on the Top ribbon	1	High	UK. Anitha	19 /3/2025	21 /3/2025
Sprint-7	Web Integration	CINTCWT-17	Dashboard And Story embed with UI with Flask	1	High	B Rajeshwari	21 /3/2025	24 /3/2025

3. Data Collection and Preprocessing Phase:

To effectively collect and preprocess data for cosmetic insights, focus on gathering both internal and external data sources, ensuring data quality and consistency, and then cleaning and transforming the data for analysis, focusing on consumer trends, preferences, and market dynamics**. Data Collection** elevate your data strategy with the Data Collection plan and the Raw Data Sources report, ensuring meticulous data duration and integrity for informed .

3.1 Exploration and Preprocessing Template:

Identifies data sources, assesses quality issues like missing values and duplicates, and implements resolution plans to ensure accurate and reliable analysis.

This structured approach ensures high-quality data for accurate cosmetic trend analysis and visualization in Tableau.

Section	**Description**	Application in Cosmetic Insights
Data Overview	Short description about dataset	Collect customer reviews, product sales, and social media trends.
Data Cleaning	Handle missing values, duplicates, and correct errors.	Remove duplicate product entries, handle missing ratings, and correct inconsistent brand names.
Data Transformation	Use of filtering, sorting, pivoting, and creating calculated fields	Sort products by popularity, filter skincare products by ingredients, and calculate trend scores.

Data Type Conversion	Rectifying Datatype	Convert price columns to numeric, standardize date formats for trend analysis.
Column Splitting and Merging	Split or merge columns as needed.	Separate product names into brand and type; merge region-wise sales data.
Data Modeling	Define relationships between tables	Connect consumer demographics with purchasing behaviour, linking sales data to marketing campaigns.
Save Processed Data	Save the cleaned and processed data for future use.	Save data in a Tableau-compatible format (CSV, Excel, SQL) for visualization.

3.2 Data Quality Report:

The Data Quality Report Template will summarize data quality issues from the selected source, including severity levels and resolution plans. It will aid in systematically identifying and rectifying data discrepancies. The below table format systematically identifies data quality issues and provides resolution strategies for accurate cosmetic industry insights in Tableau.

Data Source	Data Quality Issue	Severity	Resolution Plan
E-Commerce Sales Data	Missing product prices in some records.	High	Fill missing values using the median price of similar products.
Customer Reviews	Duplicate reviews from the same user on the same product.	Moderate	Identify and remove duplicates based on user ID and timestamp.

Social Media Mentions	Unstructured text data with inconsistent brand tagging.	High	Use text processing techniques to standardize brand names.
Product Inventory Data	Inconsistent formatting of product categories.	Low	Standardize categories to ensure uniform grouping.
Market Survey Results	Skipped responses leading to missing demographic data.	Moderate	Apply statistical imputation or exclude incomplete records from analysis.

3.3 Data Collection Plan & Raw Data Sources Identification:

Elevate your data strategy with the Data Collection plan and the Raw Data Sources report, ensuring meticulous data duration and integrity for informed decision-making in every analysis and decision-making endeavour.

Data Collection Plan:

Section	Description
Project Overview	This project aims to analyze cosmetic industry trends, consumer preferences, and product performance using Tableau. The insights will help brands and retailers make data-driven decisions.
Data Collection Plan	Data will be collected from e-commerce platforms, social media, customer reviews, beauty industry reports, and market surveys.

Raw Data Sources Identified	Various structured and unstructured data sources will be used, including online databases, APIs, and direct consumer feedback.

Raw Data Sources :

Source Name	Description	Location/URL	Format	Size	Access Permissions
E-commerce Sales Data	Online sales records of beauty products.	API / Retailer Database	CSV	10 GB	Private (Requires API Key)
Customer Reviews	User reviews and ratings of cosmetic products.	Kaggle / Online Beauty Platforms	JSON	5 GB	Public
Social Media Mentions	Market research reports on cosmetic trends.	Research Firms / Paid Reports	PDF, Excel	2 GB	Private (Subscription-Based)
Survey Data	Customer feedback on beauty preferences.	Google Forms / Survey Tools	Excel	3 GB	Private (With Admin Access)

4. Data Visualization:

Data visualization plays a critical role in navigating the complex and ever-changing

landscape of the cosmetic industry. By effectively visualizing data, businesses can gain valuable insights into consumer behavior, market trends, and competitive landscapes. This allows them to make informed decisions, develop targeted marketing campaigns, and ultimately achieve sustainable growth in the competitive world of cosmetics.

4.1. Framing Business Questions:

The process involves defining specific business questions to guide the creation of meaningful and actionable visualizations in Tableau.

1.What are the brands suitable and not suitable for sensitive skin suitability?
2.What are the products suitable for Dry skin suitability?
3.What are the brands suitable for oil skin suitability?
4.What are the ranks given for the labels?
5. *Which skincare brands have the highest number of products deemed 'not suitable' for sensitive skin?*
6. *What is the price distribution for each skincare brand?*
7. Which brands are most suitable for dry skin?
8. *Which product category has the highest number of records?*
9. What factors contribute to a brand's high ranking?
10. Which brands have the highest number of products NOT suitable for oily skin?
11. Which skincare product category has the highest average rank and how does it compare to other categories?

4.2. Developing Visualizations:

Visualization development refers to the process of creating graphical representations of data to facilitate understanding, analysis, and decision-making. The goal is to transform complex datasets into visual formats that are easy to interpret, enabling users to gain insights and make informed decisions. Visualization development involves selecting appropriate visual elements, designing layouts, and using interactive features to enhance the user experience. This process is commonly associated with data visualization tools and platforms, and it plays a crucial role in business intelligence, analytics, and reporting

5. Dashboard:

A "Dashboard of Cosmetic Insights" aims to provide a centralized view of key trends and consumer behavior in the cosmetics industry, helping businesses make informed decisions by analysing data on emerging trends, consumer preferences, and market dynamics.

5.1. Dashboard Design File:

"C:\Users\Jackson\OneDrive\Desktop\DA\Dashboard Design.pdf"

6. Report:

This report analyzes data related to top cosmetic brands, focusing on label counts, price vs. demand, skin suitability (sensitive, dry, oily), and brand ranking. The primary visualization is a pie chart representing the distribution of selected top brands, accompanied by a list of brands with checkboxes and a numerical ranking.

6.1. Story Design File:

"Story Design.pdf"

7. Performance Testing:

Performance testing in Tableau for a "Cosmetic Insights: Navigating Cosmetics Trends and Consumer Insights" project is crucial to ensure that dashboards and reports are responsive and efficient, especially when dealing with large datasets or complex visualizations.

7.1 Utilization of Data filters:

* Filtering Brands: In multiple dashboards, there's a prominent list of brands (example AMOREPACIFIC, BELIF, CAUDALIE, etc.) with checkboxes next to them. This indicates the use of a filter that allows the user to select or deselect specific brands, dynamically changing the data displayed in the visualizations.
* Filtering Categories: Some visualizations include categories like "Treatment," "Sun protect," "Face Mask," "Eye cream," "Cleanser," and "Moisturizer". While not always with checkboxes, these likely function as filters, enabling users to focus on specific product types.

7.2 No of Calculation Field:

The following are the sum of Calculation Field used in project, while creating the visualization.

1. Top Brands:

Calculation Type: Likely a Rank Calculation.

Example:

RANK(SUM([Sales], 'desc')

2. Label Count:

Calculation Type: Likely a COUNTD (Count Distinct) Calculation.

Example:

COUNTD([Label/Attribute Field])

3. Price vs Demand:

Calculation Type: Creating parameter to select a specific price range and then use a calculated field to filter data based on that range.

Example:

SUM([Demand]) / SUM([Price])

4. Brand vs Ranking;

Calculation Type: Likely a Rank Calculation.

Example:

RANK(SUM([Performance Metric]), 'desc')

5. Pie Chart Values:

Calculation Types: Likely an Aggregation Calculation.

Example:

SUM([Sales])

7.3 No of Visualization

- ***Visualization***: Side by side bar.

- ***Visualization*:** Box&whisker Plot.
- ***Visualization***: Packed Bubble Chart.
- ***Visualization*:** Bar Graph.
- ***Visualization*:** Pie chart.
- ***Visualization*:** Stacked Bars.
- ***Visualization***: Stacked Bars.
- ***Visualization***: Horizontal bar chart.

8. Conclusion/Observation:

8.1 Conclusion:

The project identified key user archetypes within the online astrology market,
providing valuable insights into consumer preferences and behaviors. It explored how
astrological trends can be used to understand consumer preferences, predict market trends, and inform business decisions. The project emphasized the importance of data-driven decision
making, combining astrological insights with traditional market research and analytics.

8.2 Observation:

In essence, "Cosmic Insights" in either context involves observing and analyzing trends to
gain a deeper understanding of consumer behavior.
The influence of digital technology and social media on consumer behavior.
The impact of sustainability and ethical consumption on purchasing decisions.
The effects of demographic changes and cultural shifts on consumer preferences.
What global events, and societal changes, alter consumer purchasing decisions.

9. Future Scope:

In essence, the future of cosmetic insights lies in leveraging technology, understanding evolving

consumer values, and embracing a more personalized, sustainable, and inclusive approach to beauty.

Future Scope Implications:

- **Data-Driven Decision Making:** Cosmetic companies will rely heavily on consumer insights to inform product development, marketing strategies, and customer experiences.
- **Enhanced Customer Engagement:** Brands will use technology to create personalized and engaging experiences for consumers.
- **Increased Transparency:** Consumers will demand greater transparency from brands regarding ingredients, sourcing, and ethical practices.
- **Focus on Holistic Beauty:** The industry will shift towards a holistic approach to beauty that encompasses physical and mental well-being.

10 Appendix:

The "appendix" in "Cosmetic Insights: Navigating Cosmetics Trends and Consumer Insights" typically refers to supplementary materials like Source code, GitHub link and Project Demo Link.

10.1. Source Code (if any):

10.2. GitHub & Project Demo Link:

LINK:
https://github.com/Rajiii-07/Cosmetic-Insights-Navigating-Cosmetics-Trends-And-Consumer-Insights-With-Tableau

LINK:
https://drive.google.com/drive/u/1/folders/19WRIXGVJjrEWkE9l8hqA9xpyhruF98lG