**Project Design Phase-II**
**Technology Stack (Architecture & Stack)**

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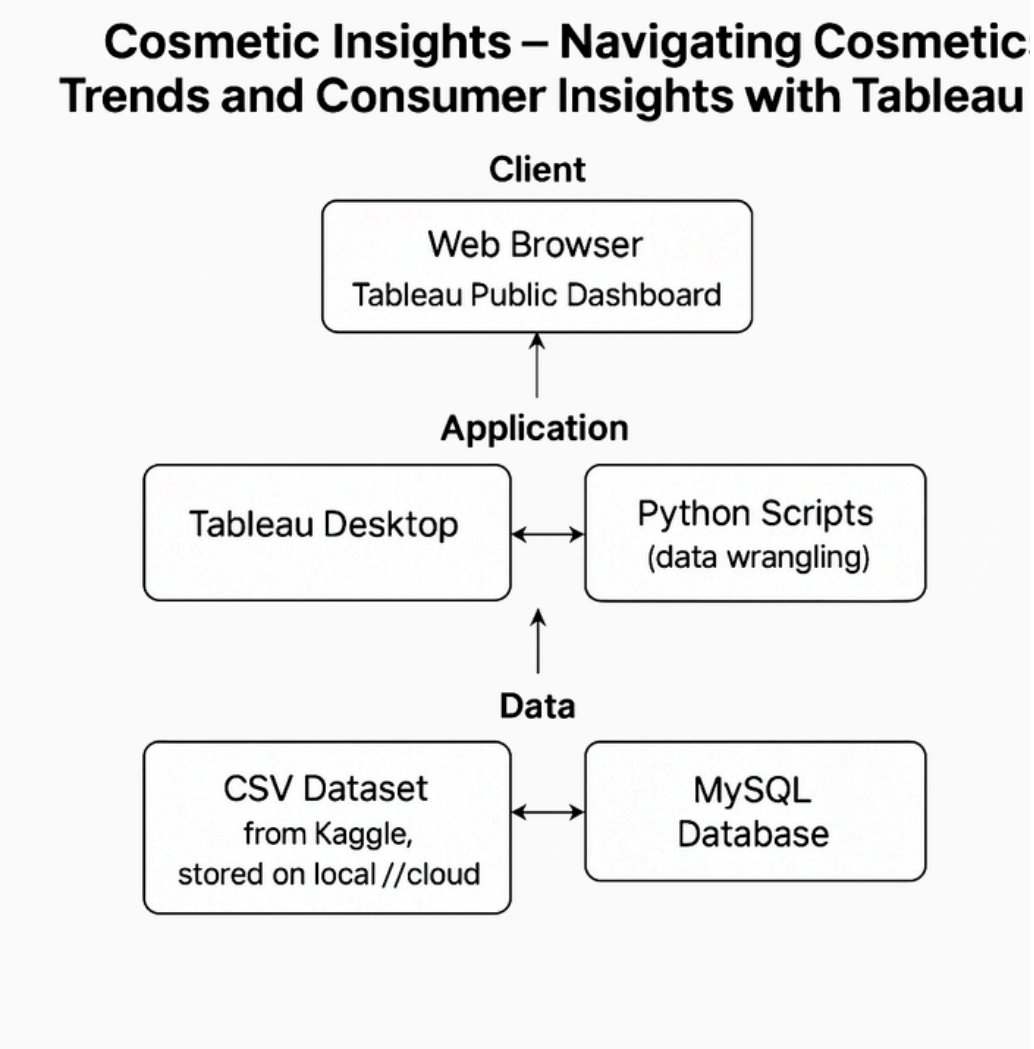
| Date | 22 june 2025 |
| Team ID | LTVIP2025TMID49795 |
| Project Name | Cosmetic Insights _ Navigating Cosmetics Trends and Consumer Insights with Tableau |
| Maximum Marks | 4Marks |

**Technical Architecture:**



| S.No | Component | Description | Technology |
|---|---|---|---|
| 1 | User Interface | Dashboard access via browser (interactive data viz) | Tableau Public, HTML/CSS |
| 2 | Application Logic-1 | Data cleaning and transformation | Python (Pandas, NumPy) |
| 3 | Application Logic-2 | Sentiment classification / NLP for reviews | Python (NLTK, TextBlob) |
| 4 | Application Logic-3 | Trend extraction, clustering of product categories | Python (Scikit-learn, KMeans) |
| 5 | Database | Structured storage for transformed data | MySQL / SQLite |
| 6 | Cloud Database | Optional cloud storage of processed datasets | Google BigQuery / AWS RDS |
| 7 | File Storage | CSV datasets and visualization exports | Local file system / Google Drive |
| 8 | External API-1 | Product sentiment extraction via APIs | OpenAI NLP API / IBM Watson NLU |
| 9 | External API-2 | Product details / e-commerce API | Amazon Product API (optional) |
| 10 | Machine Learning Model | Classification & clustering of trends | Scikit-learn, Logistic Regression |
| 11 | Infrastructure | Deployment platform for dashboards & scripts | Tableau Public, Local System |

| S.No | Characteristics | Description | Technology |
|---|---|---|---|
| 1 | Open-Source Frameworks | Data processing and modeling | Python, Pandas, Scikit-learn, NLTK |
| 2 | Security Implementations | Tableau privacy controls, local file access control | IAM roles, File-level encryption (optional) |
| 3 | Scalable Architecture | 3-tier modular: data – logic – UI; scalable to new datasets or APIs | Tableau + Python modular scripts |
| 4 | Availability | Tableau Public for global access; Cloud storage for datasets | Tableau Server / Tableau Public |
| 5 | Performance | Preprocessed datasets, minimized load times via caching in Tableau | Tableau Extracts (TDE/Hyper), CSV caching |