**Project Design Phase**

**Solution Architecture**

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| Date | 26 June 2025 |
| Team ID | LTVIP2025TMID49346 |
| Project Name | Cosmetic Insights |
| 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:

#### ****5. User Interaction Layer****

* Stakeholders interact with the Tableau dashboard via filters, slicers, and dropdowns
* Business teams can use scenario-based visuals to act on trends

#### ****4. Data Visualization Layer****

* Tableau dashboard integrates with the processed data
* Interactive visualizations include:
  + Product-wise sales and ratings
  + Platform-wise comparisons
  + Sub-category breakdown (e.g., lipsticks, serums)
  + Time-series visualizations for trend prediction

#### ****2. Data Ingestion and Storage****

* Data is extracted via web scraping/APIs
* Stored in a central data warehouse (e.g., SQL Server or Google BigQuery)
* Scheduled ETL (Extract, Transform, Load) jobs clean and unify the data

#### ****3. Data Processing Layer****

* Python (pandas, numpy) used for preprocessing
* SQL used for data aggregations, filtering, and ranking
* Sentiment analysis on reviews using NLP libraries (optional layer for future enhancement)

#### ****1. Data Sources Layer****

* E-commerce platforms (Amazon, Flipkart, Nykaa)
* Customer reviews, product listings
* Internal brand databases (sales, returns, ratings)
* Public feedback sources (social media, surveys)