Project Design Phase

Solution Architecture

Date	15 February 2025
Team ID	LTVIP2025TMID53108
Project Name	Flight Finder
Maximum Marks	4 Marks

Solution Architecture:

Frontend (Web/Mobile App): Built with a responsive UI framework (e.g., React or Flutter) enabling users to input preferences, search flights, and receive suggestions in real time.

- **API Gateway / Backend Services**: Facilitates communication between the frontend, MongoDB Atlas, and third-party services. Handles request routing, authentication, rate limiting, and failover logic.

- **Flight Data Ingestion**: Continuously pulls live data from airline APIs, normalizes it, and stores it in MongoDB using dynamic and compound indexes for efficient querying.

- **MongoDB Atlas Cluster**:

    o Stores structured and unstructured flight metadata.

    o Implements **dynamic indexing** and **aggregation pipelines**.

    o Integrated with **Atlas Search** for full-text and facet-based search across routes, pricing, duration, etc.

- **Recommendation Engine**: Uses user behaviour, preferences, and historical search data to surface contextual suggestions (e.g., price trends, alternate routes, best time to buy).

- **Analytics & Monitoring**: Tracks user interaction, system health, search patterns, and operational metrics to drive both user satisfaction and business optimization.

FlightFinder Solution Architecture

```
Frontend          API Gateway/        Authentication/
(Web/App)  <-->   Backend      <-->   User
                  Services            Management
    |                 |                   |
    v                 v                   v
Flight Data       Recommendation      Analytics &
Ingestion         Engine              Logging
                                      (Usage & Insights)
    |                 |                   |
    v                 v                   |
External Data     MongoDB Atlas Cluster
Providers         (Primary Data Store)
(APIs)            • Dynamic Indexes
                  • Aggregation Pip-elines
                  • Metadata Store for Flights
```

MongoDB Atlas Cluster
(Primary Data Store)

- Dynamic Indexes
- Aggregation Pipelines
- Metadata Store for Flights