**Project Design Phase**

**Solution Architecture**

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| 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**:
  + Stores structured and unstructured flight metadata.
  + Implements **dynamic indexing** and **aggregation pipelines**.
  + 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.

