**Architecture Overview**

The solution will be built using a **microservices** architecture, ensuring flexibility, scalability, and isolation of concerns. Each component of the system will be loosely coupled and independently deployable. Azure services such as Azure Kubernetes Service (AKS), Azure Functions, Azure API Management, Azure Azure Data Factory, and Azure CDN will be used to meet the requirements.

**1. Frontend/UI Components**

* **Web UI**: HTML5, CSS3, JavaScript React.js
* **Mobile App**: (iOS/Android) built React Native
* **Communication Channels**: Integration with SMS and Email providers (Twilio, SendGrid)

**2. Backend Services (Microservices)**

**Azure Active Directory B2C**

**Azure CDN**

1. **Profile Service**
   * **Handles user data registration, login, profiles, and authentication.**
   * **Manages user data like saved traveller profiles or preferences.**
   * **Manages flight schedules, pricing, and promotions depending on role.**
   * **Monitors analytics and generates reports.**
   * **Admin-specific metadata (e.g., permissions beyond role-based claims).**
2. **Flight Search Service**
   * **Fetches and manages flight details from external providers or databases.**
   * **Handles caching for frequently searched routes to improve performance.**
3. **Booking Service**
   * **Manages booking operations (reserving, confirming, cancelling).**
   * **Handles seat selection and inventory management.**
4. **Payment Service**
   * **Processes payments and refunds.**
   * **Integrates with payment gateways (Stripe, PayPal, etc.).**
5. **Notification Service**
   * **Sends email, SMS, or push notifications for confirmations and updates.**
6. **Analytics Service**
   * **Manages reporting, user statistics, history**

**3. Data Storage**

**Azure SQL Database: Stores relational data such as user profiles, flights, bookings, payments.**

**4. APIs and Services**

**RESTful APIs for CRUD operations on FunWithFlight entities (user profiles, flights, bookings, payments).**

**5. Scalability & High Availability**

* **Azure Kubernetes Service (AKS)**: Deploy backend microservices in scalable containers.
* **Azure Load Balancer**: Distributes traffic among the services.
* **Azure Application Gateway**: Used for web traffic routing and enhanced security.
* **Azure Traffic Manager**: Global distribution for redundancy and fast access for users worldwide.

**6. Analytics and Monitoring**

* **Azure Monitor**: For performance and health monitoring.
* **Azure Log Analytics**: For analysing logs and real-time diagnostics.
* **Azure Application Insights**: For tracking user interactions and system performance.