**SkyLink Airlines**

Enterprise Systems Architecture

Project Report

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# Introduction

We are a software consultant company engaged by SkyLink Airlines to develop layered reference architecture. Airline systems can have many different parts to them. We will start by doing research into the context of airline systems to helps us gain a deeper understanding into the workings of how airline systems operate.

# Architecture Vision

## Arline Context

### Global airlines

Skylink Airline operate flights for people and goods over many countries with different routes around the world making them a global business and needing to comply with laws and regulations for the corresponding countries in which they operate.

### Mixed aircrafts

Skylink operates with a diverse range of different aircrafts used for both passenger and cargo flights to be able to serve different demands across the globe. The airline has flexibility and can choose the right aircraft for the demand of the flight which will result in saving costs.

### Airport ground services

Grounds services deal with loading and unloading and then transport to the necessary party. E.g. suitcases back to conveyor belts where passengers can get them after disembarking. This can be automated with the help of conveyor belts to reduce human handling and increase efficiency.

Besides dealing with just cargo, ground services also help with preparing and making sure runways are safe for landing and take-offs, ramps, handling passengers getting on and off alongside cleaning up the plane before take-off. The goal is to minimize the time it takes to perform these steps

### Partner codeshares

Airlines can work with other companies and use code shares to sell tickets for flights with different companies. There could be different rates depending on which airline you book with even if it is for the same flight.

### Real time flight tracking & status updates

Flight tracking is important both for keeping your customers informed of when the plane is arriving and making sure things are staying on schedule. It is also important for safety as the runways need to be clear so a plane can land.

### Passenger reservations & loyalty management

Skylink provides flight booking system for passengers to book flights, check in online or at the airport. A loyalty program is included which allows passengers to earn points which they can redeem 10 Kilometres per Euro spent on SkyLink flights.

### Aircraft maintenance & operational analytics

As part of maintenance operation can be done on the sensors within the airline to see flight data and see if there are any indications present of things being different to expected and potentially faulty parts. It is super important to catch these potential issues before they happen.

### Security zones

Inside the airport there should be secure zones off access to the public. These allow behind the scenes operations to take place such as handling of luggage or for staff to move quickly around the airport without needing to go through the lines and security checks that customers are dealing with. Passengers stick to their own lines and check ins to keep the system moving efficiently.

### Monitoring & incident-response

Monitoring the data of how well the plane is flying is vital as flight controllers can now what is going on and if there is any danger. Live response using the data is important since urgency would be needed in case of an emergency. The data that was collected can be stored in the cloud and can be used for analysis later to see trends overall such as most common times that planes are landing or how many flights can a plane do a day on average. These can be analysed and used to assist in future business decisions for the company.

### Crew scheduling & airport resource coordination

The crew flies the plane and some work as flight attendants. There is a maximum number of hours that a pilot can work on a given day so there needs to be schedules for when another pilot is taking over, to maximise how often flights can take place. The crew also deal with maintenance and checking that the plane is flightworthy and capable of flying without issue and if there is anything that needs to be checked out or dealt with about the plane itself.

## Strategic Drivers

### 2.1.1. Safety

There are strategic important drivers that are important to airline systems. Safety should be maximised as there are lots of people about and large moving vehicles, there is a desire to avoid lots of life or harm as it would lead to lawsuits and bad public reception. Make sure that customers are safe and that planes are safe to land.

### 2.2.3. Punctuality

Punctuality wise the planes should arrive on times as listed. Any potential changes should be reflected real time in the app and on the public display flight schedule. Customers should be able to board as soon as possible after the plane has been cleaned from its previous flight and is ready for take-off.

### 2.2.4. Customer experience

As there are lots of customers it is important to deal with handling them. We are trusted to safely handle people's items. Issues like lost luggage can deeply upset customers. We try to have good customer service to encourage repeat customers by helping them solve their issues if they arise.

### 2.2.5. Cost efficiency

Cost efficiency, people tend to go for cheaper flights. There could be trade-offs such as leg room or how much you can carry on with you for luggage.

Airlines must constantly optimize fuel consumption, crew scheduling, and airport fees to reduce operational costs. Technology and automation also play a role in lowering expenses, allowing SkyLink to remain competitive while still offering a quality service to customers.

## Scope

With all this context in mind we can set an achievable scope for what we aim to accomplish from keeping track of flights, making sure planes are maintained properly on scheduling and that we treat our customers well and give them a good experience using the app and going through the airport.

This scope also ensures that both customer-facing systems and backend operational systems are considered, so improvements benefit both passengers and staff. It will help the airline focus on the most critical aspects first while leaving room for future scalability and integration with new services.

## Guiding Principles

We will do our best to satisfy our stake holders by increasing profits with process optimization while at the same time providing customers with a cost-effective flights and positive experience.

These guiding principles will act as a foundation for decision-making whenever trade-offs arise between cost, safety, and customer experience. They will ensure the architecture remains adaptable to change while still aligning with the long-term strategy of the airline.

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