**Project Report**: Flight Seats Booker

Table of Contents

**1. Introduction**

- Background

- Purpose and Scope

- Objectives

2. **Project Overview**

- Brief Description

- Features and Functionalities

- Technologies Used

3. **System Architecture**

- High-Level Architecture

- Components and Modules

4. **Installation Guide**

- Prerequisites

- Installation Steps

5. **Demo Installation and Setup**

- Required Software Packages

- Steps to Execute

- Demo Steps

6. **Use-Cases**

- Airline Use-Cases

- Passenger Use-Cases

7. **Conclusion**

**1. Introduction**

**Background**

Traditional flight booking, check-in, and boarding pass processes can be time-consuming and inefficient. The Flight Seats Booker project aims to revolutionize these processes by distributing flight seats and boarding passes to passengers as ERC721 Non-Fungible Tokens (NFTs), making the entire experience smoother and more secure.

**Purpose and Scope**

The purpose of this project is to provide a decentralized and secure platform for booking flight seats and managing check-in and boarding pass issuance. The scope includes creating flights, adding seats to seating classes, handling fees, cancelling seats, and providing passenger features like seat booking, check-in, and seat booking cancellation.

**Objectives**

The objectives of the Flight Seats Booker project are:

- To create a decentralized platform for airline seat booking and management.

- To provide passengers with a user-friendly interface for booking seats and checking in for flights.

- To implement secure and transparent payment and refund processes.

- To leverage blockchain technology for the distribution of ERC721 NFTs as boarding passes.

**2. Project Overview**

**Brief Description**

The Flight Seats Booker project is a decentralized flight booking and management system that utilizes blockchain technology to distribute flight seats and boarding passes as ERC721 NFTs. It offers features such as flight creation, seat addition, fee withdrawal, seat booking, check-in, and seat booking cancellation.

**Features and Functionalities**

Key features of the Flight Seats Booker project include:

- Creating flights with details like flight number, origin, destination, departure time, airline details, and the number of seats.

- Adding seats to seating classes with corresponding seat numbers and prices.

- Allowing airlines to withdraw fees from passenger seat bookings.

- Enabling airline seat booking cancellation, triggering refunds.

- Passengers can book available flight seats and receive ERC721 seats.

- Passengers can check-in for flights and submit passport-scan images.

- Passengers can cancel their seat bookings, triggering refunds.

**Technologies Used**

The project utilizes the following technologies and tools:

- Node.js

- NPM

- Truffle

- Solidity (solc-js)

- IPFS

- Ganache-CLI

- Metamask

**3. System Architecture**

**High-Level Architecture**

The system follows a decentralized architecture, with blockchain technology at its core. It consists of the following components:

- Smart Contracts for managing flights, seats, and payments.

- IPFS for storing passport-scan images.

- User interfaces for passengers and airlines.

**Components and Modules**

The system comprises several modules, including flight creation, seat management, payment handling, check-in, and seat booking cancellation.

**4. Installation Guide**

**Prerequisites**

Before installation, ensure you have the following:

- Node.js (v9.0.0 or later)

- NPM (v5.5.1 or later)

- Truffle (v4.1.13)

- Solidity (solc-js v0.4.24)

- IPFS (v0.4.18)

- Ganache-CLI (v6.2.5)

- Metamask

**Installation Steps**

1. Clone the project repository.

2. Open three terminals in the project folder.

3. In Terminal 1, run `ganache-cli`.

4. In Terminal 2, run `ipfs daemon`.

5. In Terminal 3, run the following commands:

```

npm install

npm run build

truffle migrate --network development --reset --compile-all

npm run dev

```

**5. Demo Installation and Setup**

**Required Software Packages**

- Local running IPFS instance

- Node.js (v9 or later)

- NPM

- Ganache-CLI

- Truffle (v4.1.13)

- Solidity (solc v0.4.24)

- Metamask

**Steps to Execute**

Follow these steps for demo installation and setup:

1. Run `ganache-cli` in one terminal.

2. Run `ipfs daemon` in another terminal.

3. In a third terminal, navigate to the project folder and run the following commands:

```

npm install

npm run build

truffle migrate --network development --reset --compile-all

npm run dev

```

**Demo Steps**

To demo the application:

1. Log into Metamask using the same seed phrase from your local Ganache-CLI instance.

2. Switch to a different Ganache account in Metamask (not the default account).

3. Select a flight to book.

4. Choose a seat and confirm the transaction in Metamask.

5. Complete the check-in process, including uploading a passport-scan image.

6. View your boarding pass, complete with a QR code and ERC721 Boarding Pass ID.

**6. Use-Cases**

**Airline Use-Cases**

- Create a flight with relevant details.

- Add seats to seating classes with prices.

- Withdraw fees from passenger seat bookings.

- Cancel a passenger's seat booking and trigger a refund.

**Passenger Use-Cases**

- Book available flight seats and receive ERC721 seats.

- Check in for flights, supplying a passport-scan image.

- Cancel seat bookings and trigger refunds.

**7. Conclusion**

The Flight Seats Booker project aims to streamline flight booking, check-in, and boarding pass issuance through blockchain technology and ERC721 NFTs. This decentralized system provides transparency, security, and efficiency for both airlines and passengers, revolutionizing the travel experience.

---

Please note that this project report is a general template and should be adapted to your specific project's details, including any code snippets, diagrams, or additional sections that may be necessary.