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# Kings Landing

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Software Requirement Specification for the Arline Boarding Pass Management System requested by the client.

*Project Members:*


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# EXECUTIVE SUMMARY

## 1. Introduction

### Purpose

The goal of this project is to develop a tailor made solution for a leading airline, Kings Landing, to manage and enable web check-in services to its customers.
This formal document creates a layout of the project as a whole, and describes in detail the features and modules which are going to be implemented. It also describes the target audience and method of deliverance of the product.

### Scope

As air travel is prominent and steadily increasing in recent times, the product sees a gigantic scope among the general public and customers of Kings Landing. This product will make air travel a lot simpler and convenient by allowing travellers to pre-book their seats and obtain their boarding passes, on their own, a day prior to the departure.

## 2. Perspective

### Product Perspective

Once the customer has booked tickets to their destination, they can use this online service to select their preferred seats and the system will generate a Boarding Pass corresponding to their travel details. The traveler need only carry a printed copy of this pass to the airport.

The product will also have a module which would allow an employee at the airport to permit the travellers to board a plane, preventing accidental mis-boarding.

## Product Functions

The product will allow a user to

1. Enter their ticket information and select their preferred seats.
2. Obtain a boarding pass with a universal QR Code, by doing a web check-in.
3. Manage and view their upcoming journeys.

The product will allow an employee to

1. Scan boarding passes and securely permit valid passengers on board a plane.
2. To view the current status of boarding information and make announcements accordingly.

## Operating Environment

The product can operate on any machine which supports web browsing.

## Design and Implementation Constraints

As information is shared by multiple systems, the product will ensure high coherence with a central datastore.
Generated boarding passes should be consistent with the datastore.
The seat selection process should be atomic, thereby preventing seat allotment clashes.

## User Documentation

A detailed how-to and FAQ section will be provided to allow users and employees to get up to speed with the product.

## 3. External Interface Requirements

### 3.1 User Interface

The website shall allow the user to login in securely.
Upon clicking on login button,

- open the login/register page
- enable logging-in [user-id, password, and a one-time access code]
- upon successful login, redirect to the page intended
- upon failure, redirect to exception processing (retry, forgot password or register)

After logging in, the user can enter their ticket information and proceed to do a web check-in. Upon clicking the check-in button,

- Show the layout of the seating arrangement in the plane
  - enable only the seats for the class the booking has been made
  - cross the seats that have already been selected by others
  - provide warning message if the seat is an exit row seat
  - provide any cost involved if certain seats are not free for selection (certain seats with more leg space)
  - upon confirming the seats, generate a boarding pass with a bar code for scanning at terminal
  - gives an option to print or send boarding pass by email

Apart from these, the user can also manage and build their profile. Upon clicking the Profile Management Button,

- Show the personal information collect and allow options for editing (name, address, DoB, current password, preferences)
- Mandate upload option for id proof (and/or address proof) for name, DoB and address changes.

## 3.2 Software Interface

The product shall be integrated with the existing Kings Landing website as a new module without disrupting the other services.

To make the web-app, the front end shall be developed using

- HTML 5
- CSS
- JavaScript

The backend shall be developed completely in Python 2 using the Flask framework, with SQLite being the datastore. The entire codebase shall be ported to a Cloud based server to make the  web-app publicly accessible on the Kings Landing public domain.

## 3.3 Communication Interface

The frontend and the backend communicate over the internet and through the server. The backend and the datastore communicate through the server. The barcode scanner and employee-end of the product communicate and transfer information through Bluetooth.

# 4. System Features

## 4.1 Seat Allocation Engine

The central module of this product is the Seat Allocation Engine, on top of which all other sister modules are built.

The Seat Allocation Engine performs a constraint based satisfaction by allocating seats to the users with the guarantee that no two customers face a clash. It achieves this with a state of the art resource locking mechanism in accordance with time constraint which ensures atomicity and consistency.

## 4.2 Boarding Pass Generator

This module collects all of the user's travel details from the datastore, communicates with the airlines and issues a universal pass, along with a unique QR Code which has all the details encoded in it.

This module then prepares the boarding pass and emails it to the user.

It contains all information such as the Flight Number, Seat Number, ETA, Destination, Terminal Number, Gate Number and Luggage transfer information.

## 4.3 Flight Entry Module

This module will be handled by the employees at the airport. It scans the QR Code of a passenger's boarding pass, and decodes the information contained in it. This information is cross-checked with the central datastore and issues an alert if the passenger is about to board a wrong flight.

It also gives the employees other details such as the number of passengers yet to board, the number of passengers already on board and urgent messages which needs to be conveyed to a passenger at the time of boarding.