Airline Crew Scheduler
Requirements Analysis Document

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Introduction

Purpose

The purpose of this software is to provide Cornhusker Airlines with scheduling software, allowing the airline crew administrator to schedule staff and airplanes for flights, the crew to search for the schedules, and the public to search for flight takeoff and landing times.

Scope

The crew manager will be able to input and remove information to facilitate the flight and corresponding crew schedules from CHA to three nearby airports: Iowa City, Iowa; Evanston, Illinois; and West Lafayette, Indiana. Additionally, the crew will be able to search the schedules for information on flights and working time. The system needs to have backup and restore capabilities. Also , the guest user will be able to search the flight and track them.

Objectives and Success Criteria

There are two types of aircraft at CHA and 3 types of crew members. Each flight must have a flight number, a captain, a first officer, and one flight attendant for every 50 passengers. The scheduler needs to keep track of each flight and its takeoff and landing times as well as staff and their working hours. The software will have input for all flights then generates flight numbers. The software will be considered successful when it can have this information input, update the information, retrieve the information, and backup and restore the information.

Definitions, Acronyms, and Abbreviations

CHA - Cornhusker Airways
Captain - Qualified pilot for a particular aircraft
First Officer - Qualified pilot or co-pilot for a particular aircraft
Flight Attendant - Crew member responsible for the safety of the passengers in the main cabin for the duration of a flight.

GBR-10 - Type of aircraft, capacity 45 passengers
NU-150 - Type of aircraft, capacity 75 passengers

References

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Overview

This project is based on a crew scheduling system for Cornhusker Airways (CHA) that performs various tasks for different levels of administrators. It enables CHA to keep track of employees who are scheduled to be on the aircraft. CHA operates two types of aircrafts GBR-10 and NU-150 with capacity of 45 passengers and 75 passengers respectively. There are different authorization protocols for differents administrative positions like qualified Captain, first Officer, flight attendant .

Current System

Empty

Proposed System

Overview

The scheduling system should be able to keep track of the CHA crew members. The system should be able to assign correct position and number of crew members required for each type of airplane. Furthermore, the system should be able to keep track of both the estimated and actual time of takeoff/touchdown of the airplanes. The system should also be able to log in all the updates made to the schedules and these updates should be accessible for searching based on the flight number.

Functional Requirements

F1. Ability to place aircraft when it is brought into CHA’s fleet
F2. Place employee to establish the initial airport for a crew member
F3. Qualify pilot or co-pilot to operate an aircraft
F4. Create flight complete with flight number, aircraft, origin & destination airports, scheduled takeoff & touchdown times, and required crew members
F5. Cancel flight, which frees crew members for other flights

F6. Change crew member on a flight
F7. Change aircraft for a flight, which cannot be done after takeoff has been set
F8. Change estimated takeoff time, which needs to automatically update the estimated touchdown time.
F9. Set actual takeoff time, which will set the estimated touchdown time.
F10. Change estimated touchdown time to account for in-flight delays
F11. Set actual touchdown time

Nonfunctional Requirements

N1. Each flight must have sufficient staffing of qualified crew members
N2. An aircraft can't be flown from CHA if it is not located at CHA
N3. There must be 30 minutes between touching down for one flight and taking off for the next flight for each aircraft.
N4. If a flight delay causes more the time between flights to be less than 30 minutes after the aircraft has landed, either the next flight needs to be delayed to allow for 30 minutes or the aircraft needs to be changed out for a different one that has been grounded for at least 30 minutes.
N5. Flights from CHA cannot use crew that are not located at CHA
N6. Employees can only work up to 8 hours a day.
N7. Employees must have a rest period of 16 hours between work days.

System Models

Scenarios

Best case : The system is working as expected and there is no bug in code. Every client is perfectly able to fetch data and see the time schedule.
Normal case : The system is working but at some time it crashes . It means there must be some bug in code. Like might be admin is not able to add a aircraft.
Worst case : The system is not working at all.

Use Case Model

System administrator opens the airline website and click on login then enter his admin credential to open up control dashboard. Further he/her can manage or enter new data about crew or aircraft. After usage he/her can log out safely and save changes then it will be ready to re-login again.
Crew and passengers can go directly into phone application or website and enter the flight number into the tracking box and check its time schedule.

Crew can use their login credential to access the privilege service like check the assignment of the flight, it schedule and further trip.

Object Model

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Dynamic Model

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User Interface: Navigational Paths and Screen Mockups

System Administrator can access privilege service to change or add the functionality like adding flight and crew and also can change or set the flight takeoff and landing time through his/her web application. Crew member can check their time schedule through phone application and airline web application.

Glossary

Actual Takeoff/Landing – the precise time at which the aircraft takeoff/landed.
Administrator – Someone who has all the access over the system.
Aircrafts – vehicles operated by the Airways.
Captain – a senior pilot who commands the crew of an airplane.
Estimated Takeoff/landing – predicted time at which the aircraft might takeoff/land.
Functional Requirements – describes the functionality of the system.
Grounded – An aircraft not being used for a while.
Non-Functional Requirements – User level requirements including usability, reliability and implementation.
Pilot – a person who flies or is qualified to fly an aircraft.