Technical Report - **Product specification**

GateMate

Course: IES - Introdução à Engenharia de Software Date:

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Project abstract:

GateMate is centered around the collection, organization, and presentation of flight data obtained through the AvitionStack API. It addresses the high-level business problem of simplifying and enriching the airport experience for travelers.

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1 Introduction

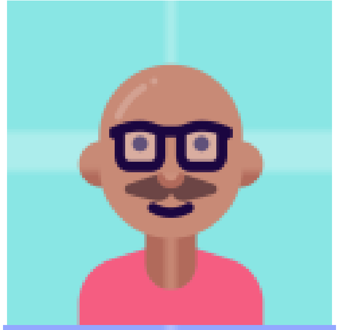
This project was initiated with the primary objective of developing a fully functional, multi-service application. Beyond the application itself, it serves as a comprehensive learning experience encompassing various aspects of application development, such as user stories, branch management, and agile architecture. This report details our journey in achieving these objectives.

2 Product concept

Vision statement

GateMate is centered around the collection, organization, and presentation of flight data obtained through the AvitionStack API. It addresses the high-level business problem of simplifying and enriching the airport experience for travelers. It achieves this by offering a comprehensive solution for gathering, organizing, and presenting real-time flight data. Travelers often face challenges in navigating through airports, keeping track of gate changes, and staying informed about the status of their flights. This application resolves these challenges by enabling users to scan their boarding passes or manually search for their flight, after which they receive up-to-the-minute notifications and directions, ensuring they are always in the right place at the right time.

While several flight-tracking applications exist, our system differentiates itself by focusing on the integration of multiple services, combining AviationStack API data with user-friendly functionalities. Our application is designed to be more than just a flight tracker; it's a travel companion that offers an intelligent, context-aware experience for travelers.

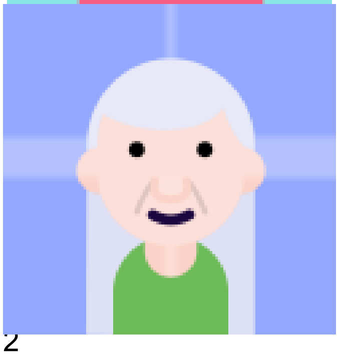


Personas and Scenarios

Hank Greens is a forty-three-year old environmental expert. He loves his job as it allows him to be in contact with nature, which he was passionate about ever since he was a kid.

He has a wife, Daisy and a 5-year-old daughter named Rose.

Motivation: as his job requires him to travel by plane often, he wants to use this app to keep track of flights to make sure he doesn't miss his flights.



Sara Sousa is a seventy-year-old woman. She used to work as a waitress before she retired. Despite her age, Sara is very active and often goes for jogs in the morning.

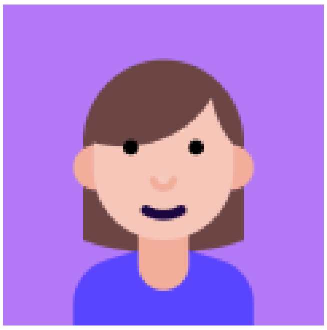
Sara's husband died recently, so she travels often to see her son, Matias, who lives abroad.

Motivation: Sara has had some trouble tracking flights recently and wants a site that helps her double-check where to go.

Carlos Andrade is a 35-year-old marketing manager with a passion for photography and travel. Mark frequently travels for both work and leisure, exploring various destinations with his family.

He values his travel experiences and wants to ensure that every aspect of his journey is as smooth as possible

Motivation: Carlos recently suffered a leg injury that limits his mobility. This injury makes it difficult for him to constantly get up to check if his flight's gate has opened, as he used to.



Clara Mitchell, at the age of thirty-eight, is an aviation enthusiast. Since childhood, she developed a passion for aeronautics and has always had a deep curiosity about planes that fly over a specific location. She grew up near an airport and spent her free time tracking flights and learning about different aircraft models. This passion for aviation has stayed with her into adulthood.

Motivation: Clara wants to use an app to track flights passing over her favorite spotting location, which happens to be near an airport. Her main motivation is to gather data about the types of aircraft, their flight paths, and other related information to satisfy her curiosity and expand her knowledge of the aviation world.

Scenarios:

Hank tracks the plane: Hank is nervous since he doesn't have a lot of time between his arrival and the connection flight. Hank goes to the webpage, goes to "flights", filters by airport and sees that the plane has left way later than he was supposed to. Hank then contacts his flight agency and manages to change his connection flight to a later time.

Sara subscribes to flight: Sara is at the airport and doesn't want to miss the flight. So she goes to "flights", searches for the flight and subscribes to it. A few minutes before the flight, Sara gets an email informing her that her plane is about to arrive, so Sara goes to the terminal and gate indicated in the email and catches the flight.

Mark's Gate Notification Assistance: Carlos Andrade, who recently suffered a leg injury, is at the airport with his family. He's in a cast and can't easily get up to check the airport information board. Mark uses the application to receive a notification as soon as the gate for his flight opens. This feature allows him to comfortably stay seated and not worry about missing his flight, giving him peace of mind while he recovers from his injury.

Clara is in her favorite location, a peaceful park near a small airport, where she often spends her evenings watching airplanes as they take off and land. Armed with her trusty binoculars and her flight tracking app, she sits on a bench and gazes at the open sky. She opens the app and sets her location to the park, configuring it to track all flights passing through the area.

Product requirements (User stories)

- As a User, I want to search and filter for flights so I can get more information about the flight I want.

- As a User, I want to receive a notification when gates open.
- As a User, I want to receive real-time data for a flight so I can know if it’s delayed.
- As a User, I want to register and login, so I can subscribe to flights I want to be notified about.
- As a User, I want to be notified when the plane is about to take off, so I don’t miss it.
- As a User, I want to be notified when the plane is delayed, so I can reschedule connection flights if needed.
- As a User, I want to use a flight tracking app to receive updates on the planes passing over any location, so I can indulge my curiosity about the aviation world.

3 Architecture notebook

Key requirements and constraints

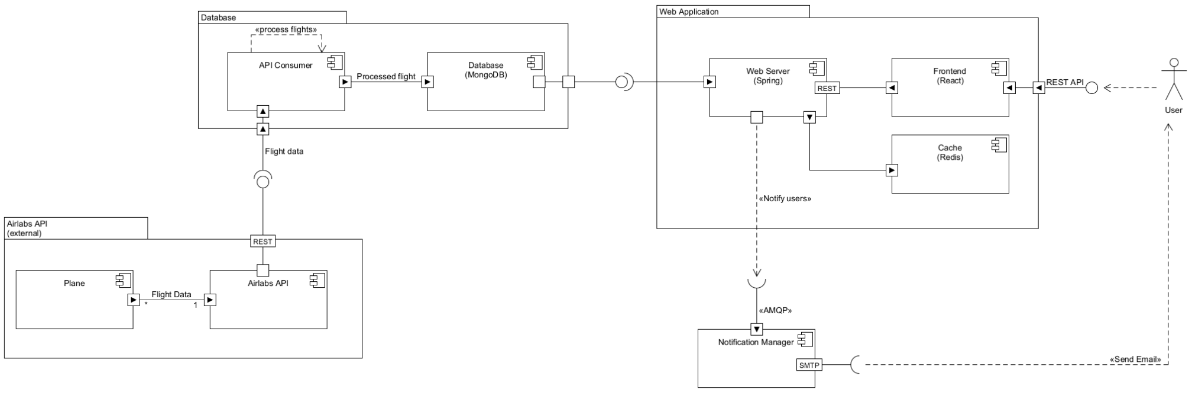
The developed system must have the following requirements:

- The system must have a web interface compatible with most browsers.
- The webpage’s interface must be simple to use.
- The website must allow user registration/authentication.
- The components must be able to scale independently from each other.
- The site must be able to respond properly even when dealing with high traffic (during the holidays).
- The system must be able to fetch data periodically from the AviationStack API.
- The system must be able to deal with multi-page responses from the API.
- The system must be able to update the database with said data
- The system must be able to notify users by email that their plane is about to arrive.
- The notification system must take flight delays into account.
- The webpage must display nearby planes.
- The system must not allow unauthorized access to the database.

<Identify issues that will drive the choices for the architecture such as: Will the system be driven by complex deployment concerns, adapting to legacy systems, or performance issues? Does it need to be robust for long-term maintenance?

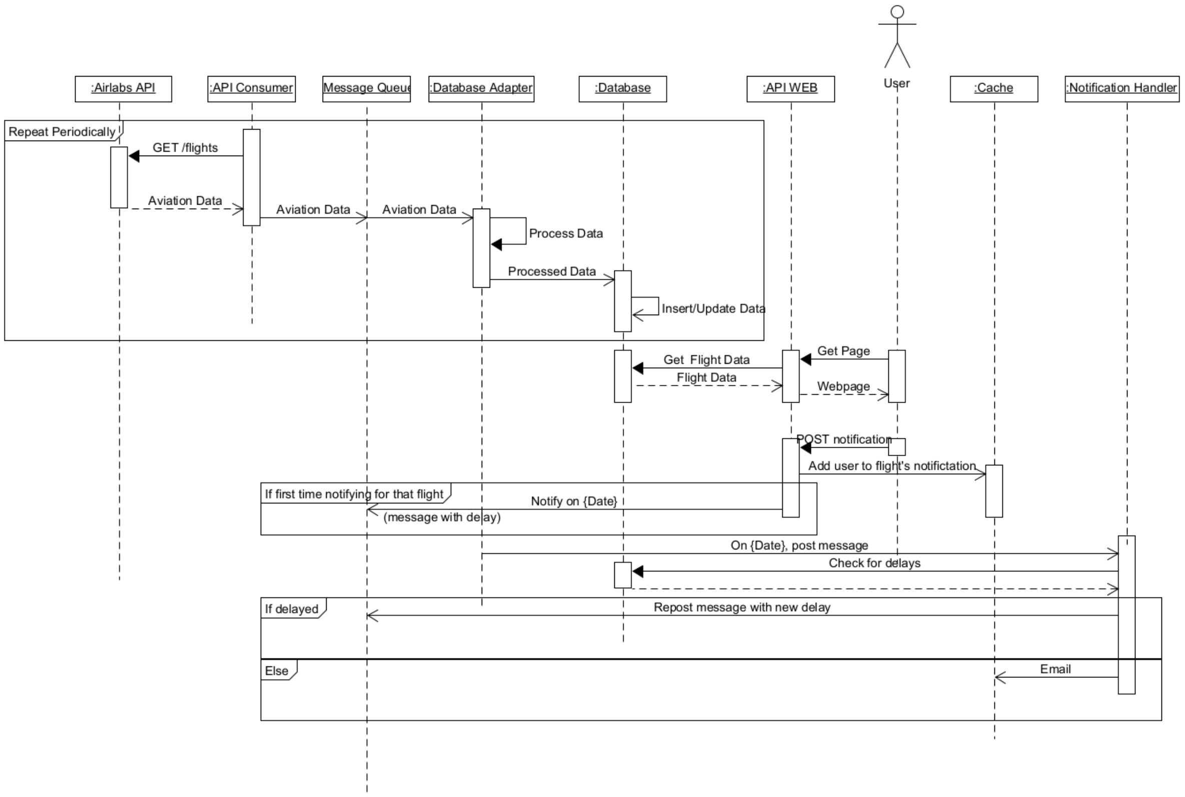
Identify critical issues that must be addressed by the architecture, such as: Are there hardware dependencies that should be isolated from the rest of the system? Does the system need to function efficiently under unusual conditions? Are there integrations with external systems? Is the system to be offered in different user-interfacing platforms (web, mobile devices, big screens,...)?

Architectural view

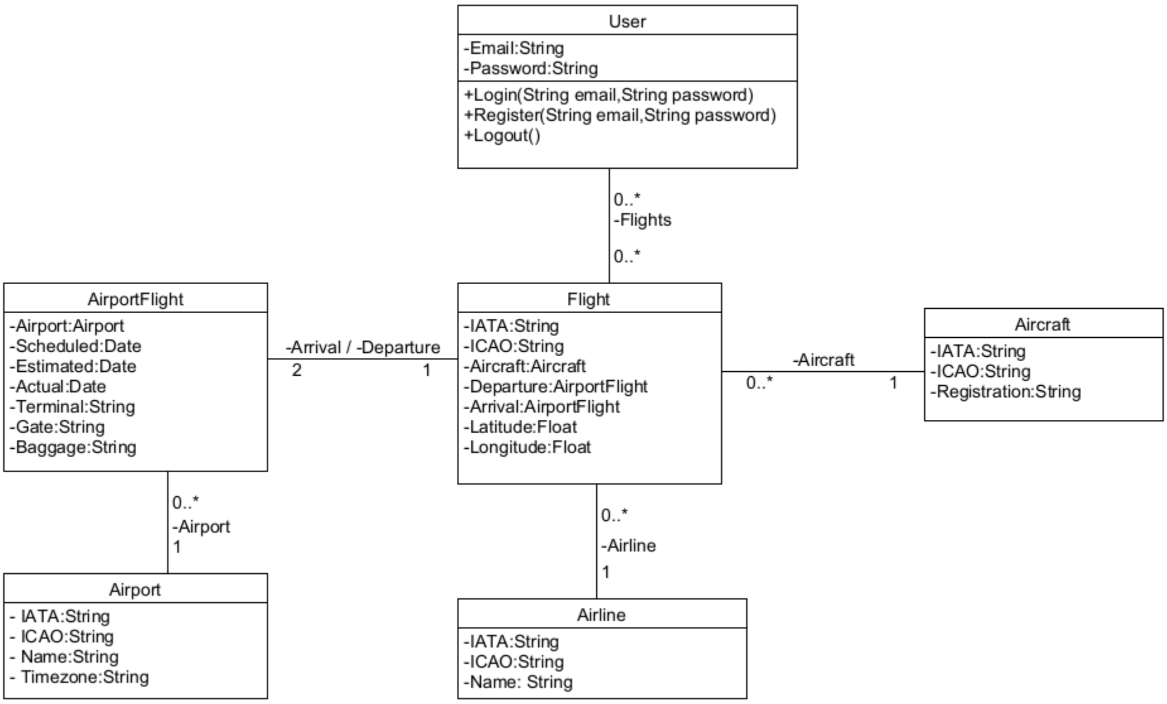


Object	Component	Description
Web Application	Front-End	Provides the presentation layer to the user
	Web Server	Acts as a controller that provides the information from the database to the front-end
	Cache	Redis database that provides chachin of non-permanent data (session information, recent requests,...)
Database	Database	MongoDB Database that stores most of the data.
	API Consumer	Fetches Data from the API and stores it in the database
Notification Handler	Notification Handler	Component that handles the email notifications
Airlabs API		External API that gathers and organizes data about flights, airports,...

Module interactions



4 Information perspective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-Password:String
+Login(String email,String password)
+Register(String email,String password)
+Logout()
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-Flights
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