STAKT - PRJ GROUP 2

Summer 2025

SOFTWARE REQUIREMENTS SPECIFICATION

GitHub Link: https://github.com/tommy-chabiras/skytrackr

Project Name:

SkyTrackR

Seung, Truong, Arky, Khanh, Tommy

Executive Summary

Background

Description

Company Value Add

End-user Value Add

Scope

What is Included

- Price trends
-

What is Not Included

Justification

This project is justified by the growing demand for smarter airfare tracking solutions. Current platforms lack real-time notifications and transparent cost breakdowns, leaving travelers uncertain about the best time to book flights. By providing predictive insights, personalized dashboards, and detailed pricing transparency, SkyTrackR addresses a real-world problem while offering academic value by applying data-driven methods, system design, and user-centered development practices.

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Section 1

1.1 Document Authors

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Khanh Anh Kiet Nguyen

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Seung Hoon Han

1.2 Document Revision History

WEEK	DATE	Revisions
1	Sept. 17, 2025	• Initial document formatting • Edited Sections 1 - 2.1
2	Sept. 18, 2025	• Edited Section 2.1 • Added Executive Summary - Justification
3	Sept. 24, 2025	• Initialize sections 2.2, 2.3, 2.5 •
4	Sept. 25, 2025	• Edited Sections 2.2-2.5 • Added References to Section 2.1
5		•
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1.3 Document Purpose

The purpose of this document is to define the foundation of the **SkyTrackR Project**. It establishes the project background, objectives, scope, and intended deliverables, while also serving as a formal agreement between the project team, stakeholders, and faculty advisor. This document provides clarity on expectations, responsibilities, and success criteria for all parties involved.

1.4 Audience

This document is intended for:

Faculty Advisors/Clients: To assess the feasibility, quality, and alignment of the project with academic and business requirements.

Team Members: To maintain a shared understanding of goals, scope, and deliverables.

End-Users/Stakeholders: To confirm that the product vision and scope address their needs.

Project Evaluators: To evaluate progress, adherence to methodology, and overall outcomes.

1.5 Group Agreement

Team #: 2

Project Title: SkyTrackR

Project Time Frame: September 17, 2025 - April 17, 2026

Team Members:

Arky Lun, Khanh Anh Kiet Nguyen, Tommy Chabiras, Truong Ma, Seung Hoon Han

Team Leadership: Khanh Anh Kiet Nguyen

Team Functions/Roles:

Arky Lun (Business Analyst),
Khanh Anh Kiet Nguyen (Project Manager),
Tommy Chabiras (Backend Developer),
Truong Ma (UI/UX Designer),
Seung Hoon Han (Frontend Developer)

Team Meetings

- Weekly In-Person Meeting: Every **Wednesday** on campus to review progress, resolve issues, and plan next steps.
- Weekly Online Meeting: Every **Thursday** through Teams for status updates and coordination.
- Ad-hoc Sessions: Additional meetings as needed for sprint planning, backlog refinement, or urgent reviews, held on **Discord**.

Team Problems

- Keep communication open and clear
- Respect and listen to all member's ideas
- Focus on the problem not the individuals

Team Commitment

The undersigned members agree to work together on the project until the end of the PRJ666 next Semester. They recognize that as a team and individually they are equally responsible for the quality of all deliverables.

Name	Date	Signature
Arky Lun	Sept. 17 2025	Arky Lun
Khanh Anh Kiet Nguyen	Sept. 17 2025	Khanh Anh Kiet Nguyen
Tommy Chabiras	Sept. 17 2025	Tommy Chabiras
Truong Ma	Sept. 17 2025	Truong Ma
Seung Hoon Han	Sept. 17 2025	Seung Hoon Han

Section 2

2.1 Project Proposal

2.1.1 Project Background

Features	Google Flights	Skyscanner	Expedia	Flight Deals	SkyTrackR
Flight Search and Comparison	✔	✔	✔	✔	✔
Price Tracking and Alert	✔	✔	✔		✔
Personalized Watchlist		✔	✔		✔
User Reviews		✔			✔
Price Trend	✔	✔	✔		✔
AI Price Prediction					✔
Airline Info (e.g. pet policy)			✔		✔
Offer deals/discounts	✔	✔	✔		

Google Flights [1]

Google Flights is an online flight search engine that is designed to help travellers quickly find and compare airfare across a wide range of airlines and booking platforms.

This tool offers travellers a fast and reliable way to search for flights across numerous airlines worldwide. One of the strongest advantages of Google Flights is its ability to help travelers visualize price trends. The platform provides interactive charts and calendars that display how fares fluctuate over time, making it easier for users to identify the cheapest travel dates. These visualizations allow travelers to quickly spot patterns, such as seasonal increases or weekend price spikes.

Although Google Flights provides helpful visualizations and price trend charts, these tools remain largely descriptive rather than predictive. Users can only see how fares have fluctuated in the past or compare options across flexible dates. Additionally, they can sometimes oversimplify the data leaving out critical details such as hidden fees, baggage charges or seat selection costs.

Skyscanner [2]

Skyscanner is an aggregation platform that brings together different travel agency information and prices. This includes specific flight prices, 1 to 5 star user reviews, and a page dedicated to decreased ticket prices. This may count as a simple form of price trend analysis. However, with the frequency of ticket prices changing, prices shown on Skyscanner sometimes change after redirecting to the Travel Agency/Airline site. Hidden fees such as baggage costs and taxes are also not included in the prices shown, leading to confusion. Additionally, Skyscanner does not handle the booking, instead requiring users to click through to the OTA/airline sites to book which may cause feelings of redundancy.

Expedia [3]

Expedia is a platform allowing travelers to book and reserve many different traveling services including flights, hotels, rental cars, and vacation packages. They also include the specific details and price tracking of each of these services, but Expedia doesn't really have one main service or feature they excel at, their price prediction feature is very undetailed and leaves a lot to be desired from the user.

Flight Deals [4]

Flight deal platforms save time by scanning multiple routes and sending quick alerts, which can be useful for flexible travelers. These services are not personalized, often focusing on broad routes rather than user-specific needs. Alerts may not be real-time, deals can expire quickly, and there is little transparency about taxes, baggage fees, or policies.

SkyTrackR levers AI to provide accurate price predictions, detailed insights, and clear all-in-one cost breakdowns. By showing the true cost upfront including baggage, seat selections(economy, business, first class), and taxes, SkyTrackR aids travelers in planning trips with confidence and clarity.

Our AI solution goes beyond static searches by offering real-time notifications with full price breakdown, personalized watchlists/dashboards, and predictive insights into future price changes from OTAs and airlines. This allows travelers to simplify their trip-planning experience with clear, data-driven information our solution seeks to provide.

2.1.2 Problem Statement

The idea for SkyTrackR came from a problem almost every traveller has faced, hunting for cheap flights and never being sure if they're booking at the right moment. One day the ticket looks affordable but becomes expensive the next day. Airline prices are unpredictable and constantly changing because of demand, competition or even the day of the week itself.

The ticket prices for airlines constantly fluctuate, making it difficult for customers to decide on when to purchase a flight ticket. Customers will often book a flight and later discover a price lower than what they purchased it for, creating uncertainty and buyer's remorse when they want to book a flight in the future.

Existing solutions such as Google Flights, Skyscanner, and others attempt to address this issue, but their limited alerts, lack of real-time tracking, and insufficient cost transparency leave travelers without the guidance they truly need.

2.1.3 Product Vision

The goal is to develop an application that provides real-time updates on ticket prices and transparency on overall cost of the ticket and price trends to travellers as well as building confidence in their purchase. The platform should support user integration, enabling the creation of personalized profiles and a user dashboard where all tracked flights are conveniently saved. It should also offer a comparison between airlines to help users find the best deals. Additionally, travellers should be able to save their preferences for destinations, airlines, and specific travel dates for a more tailored experience. A subscription service can provide access to premium features, including advanced tracking options such as AI-powered pricing predictions and exclusive discounts on hotels and amenities.

2.2 Stakeholders and Users

Internal:

- **Project Manager** - Oversees the project timeline, ensures milestones are met, coordinates communication between team members, and aligns deliverables with client and academic requirements.
- **Developers Team** - Responsible for building the backend services, integrating airline APIs, implementing real-time tracking, and ensuring the application functions smoothly and securely.
- **UI/UX Designers Team** - Designs an intuitive and user-friendly interface, focusing on clear visualization of price trends, cost breakdowns, and seamless navigation for end-users.

External:

- **Travellers** - Individuals searching for flights who want transparent pricing, real-time notifications, and AI-driven recommendations to make informed booking decisions.
- **Travelling Agencies** - Third-party platforms that can integrate SkyTrackR's features into their systems or benefit from data insights to improve their offerings.
- **Airlines** - Provide real-time flight data, pricing, and policy information through APIs, enabling SKyTrackR to deliver accurate and up-to-date information to users.
- **Third-Party API Providers** - Offer additional travel-related services that can be integrated into SkyTrackR in future iterations to improve user experience.
- **Investors/Sponsors** - Provide the financial resources and strategic support necessary for the development and long-term sustainability of SkyTrackR. Their involvement helps fund essential components such as API integrations, AI model training, and infrastructure scaling. In return, they gain opportunities to participate in the platform's growth, future commercializations, and potential partnerships with travel agencies and airlines.

2.3 Project Scope

Included Project Scope:

- **User Authentication:** Login/Register interfaces
- **Basic Dashboard:** Flight search and results display
- **Real-Time Data Updates:** Integration with airline APIs
- **Database Integration:** Data storage
- **UI/UX Design:** Clean, easy-to-use front-end
- **(Stretch Goal):** Simplified AI model for basic price trend prediction

Excluded Project Scope:

- **B2B Web & Mobile App API**
- **Full AI Integration:** Advanced predictive modeling, data training, and testing
- **Additional Visual Enhancements:** UI polish and dynamic animations
- **B2B Offers, Deals, and Discounts:** Future collaboration after main features are done

2.4 System Risks

- **AI failures to predict prices**: The model may give wrong price forecasts causing users to miss better deals
- **Failure to get the API from the travelling agencies:** APIs from airline or travel agency may be unavailable, change, or block access, breaking daily checks
- **Inaccurate or missing historical pricing data:** Historical flight data may be incomplete or inaccurate, reading prediction quality
- **Data Drift:** Seasonal changes or sudden events make past data less reliable
- **Legal and Compliance Issues**: Scraping or storing user travel data without consent could break laws
- **Web scraping of ticket pricing data**: Causes increased API calls and greatly increases the server load
- **Excessive API calls**: Large amount of API calls leading to increased fees and hitting API rate limits.
- **Notification Failures:** Too many alerts for small price drops also missed or delayed alerts lead to lost trust if users discover cheaper prices elsewhere.

2.5 Operating Environment

Users can use SkyTrackR on the web browser. The web platform will be created with JavaScript, specifically using the React library. For user authentication when signing up or logging in, we will use Next.js which is a subset of React, to protect user's credentials. We will also use Next.js for integrating API for flights to save time from creating the API from scratch.

2.6 Functional Requirements

2.7 Nonfunctional Requirements

2.8 UI/UX Interface Mock-ups

Section 3

3.1 Data Flow Diagrams

3.2 User Stories and related Use Case Scenarios

3.3 Activity Diagrams

3.4 Business Rules

Business Rule #	Description	Activity Diagram	Related UCS	UI Mock-up
BR1		AD1	UC1	UI 2.7.2
BR2		AD2	UC2	UI 2.7.3
BR3		AD3	UC3	UI 2.7.4
BR4		AD3	UC3	UI 2.7.4
BR5		AD5	UC4	UI 2.7.6
BR6		AD6	UC5	UI 2.7.6
BR7		AD7	UC6	UI 2.7.7
BR8		AD8	UC7	UI 2.7.8
BR9		AD8	UC7	UI 2.7.8
BR10		AD8	UC7	UI 2.7.8
BR11		AD8	UC7	UI 2.7.8
BR12		AD8	UC7	UI 2.7.8
BR13		AD9	UC8	UI 2.7.9
BR14		AD9	UC8	UI 2.7.9
BR15		AD9	UC8	UI 2.7.9
BR16		AD9	UC8	UI 2.7.9
BR17		AD10	AD9	UI 2.7.9
BR18		AD10	AD9	UI 2.7.9
BR19		AD10	AD9	UI 2.7.9
BR20		AD11	UC10	UI 2.7.10
BR21		AD11	UC10	UI 2.7.11
BR22		AD11	UC10	UI 2.7.11
BR23		AD12	UC11	UI 2.7.10
BR24		AD13	UC12	UI 2.7.12

Section 4 – Domain Class

Section 5 – Database

Section 6 – Project Management

6.1 Work Breakdown Structure

6.2 Milestones & Acceptance Criteria

Section 7 – Product Backlog & Implementation Schedule

Section 8 – Client/Faculty Sign-off

Section 9 – References

References

[1] Google, “Google Flights,” *Google Travel*, accessed Sep. 25, 2025. [Online]. Available: https://www.google.com/travel/flights/

[2] Skyscanner, “Skyscanner,” Skyscanner.ca, accessed Sep. 25, 2025. [Online]. Available: https://www.skyscanner.ca/

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https://www.expedia.com/

[4] Google, “Google Flights Deals,” Google Travel, accessed Sep. 25, 2025. [Online]. Available:

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