DriveBuddy

Drive aware, get there!

drivebuddy.wmdd.ca

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Table of Contents

Project Overview

Problem

Drowsy driving is a serious safety risk, contributing to 21% of vehicular accidents in Canada, resulting in about 2,100 serious injuries and 400 fatalities annually. Fatigue slows reaction times, impairs focus, and affects judgment, making it one of the top three causes of collisions in the country. For industries requiring long driving hours, such as long-haul trucking and ride-share services, this risk is even greater. For companies, this leads to:

- Driver safety concerns
- Productivity losses
- Delivery delays
- Higher insurance costs
- Potential liabilities

Without proper monitoring, companies struggle to identify and address these risks early.

Solution

DriveBuddy is an AI-powered mobile app designed to help drivers stay safe by detecting early signs of drowsiness. Face and eye monitoring technology tracks signs like frequent blinking or closed eyes. Instant sound and voice alerts notify drivers when signs of fatigue are detected. Nearby rest stop suggestions encourage timely breaks to recharge. Administrator Dashboard provides real-time insights into driver safety, alerting companies to potential risks before they become incidents.

Impact

By combining proactive safety features with practical support, DriveBuddy:

Reduces accident risks

Promotes driver well-being

Empowers companies to manage fleet safety effectively

Improves operational efficiency

DriveBuddy makes roads safer — for drivers, companies, and everyone.

Main Features

Face and Eye Monitoring & Alert

DriveBuddy uses AI and machine learning to monitor a driver's face and eyes in real-time to detect signs of drowsiness such as eyes closed for extended periods, or frequent blinking which are natural responses of drowsiness. Once signs of drowsiness are detected, the app delivers sound and voice alerts, which help drivers stay awake.

GPS Navigator & Nearby Rest Stop Suggestions

DriveBuddy displays the driver's current location on the map, and suggests the best route to reach their destination efficiently, ensuring they stay on track and avoid unnecessary detours. If there are signs of drowsiness detected, the app suggests the best route to reach their destination efficiently, ensuring they stay on track and avoid unnecessary detours.

Administrator Dashboard

DriveBuddy provides an admin website that allows companies to monitor their drivers' safety and well-being, providing insights such as drowsiness alerts to help identify potential safety risks before they escalate.

Competitor Analysis

DriveBuddy stands out by combining real-time drowsiness detection, proactive alerts, and an administrator dashboard — a combination that most competitors lack. Unlike traditional navigation apps like Google Maps or Waze, DriveBuddy prioritizes driver safety over general route guidance. While apps like Drowsy Alert and Samsara offer drowsiness detection, they either lack comprehensive navigation support or are tailored for large-scale fleet management.

DriveBuddy strikes the right balance — offering individual driver support while equipping companies with actionable insights to improve fleet safety.

Here's how DriveBuddy compares to other popular solutions in terms of key features:

	DriveBuddy	Samsara	Drowsy Alert	Waze	Google Maps
Face & Eye Monitoring	✓	✓	✓	✗	✗
Sound & Voice Alerts	✓	✓	✓	✓	✓
GPS Navigation	✓	✗	✗	✓	✓
Nearby Rest Stop Suggestions	✓	✗	✗	✗	✗
Administrator Dashboard	✓	✓	✗	✗	✗

Project Milestones

Design

Week 1	Project requirements research
Week 2	Technical requirements research
Week 3	Data models, environment setup, backend basics
Week 4	Sleepiness detection, map integration, layout setup
Week 5	Detection optimization, voice alerts, backend setup
Week 6	Admin flow, navigator, profile & history pages, styling
Week 7	Rest stop suggestions, backend connection, Alpha build
Week 8	Invitation system, journey summary, Alpha build
Week 9	Data visualization, offline maps, marketing page, bug bash
Week 10	Algorithm improvements, marketing page, Beta build
Week 11	Beta build bug bash
Week 12	Code freeze, final build
Week 13	Final Presentation

Development

Week 1	Research idea project requirements
Week 2	User Research, Personas, Story Mapping
Week 3	Wireframes, UI Kit, Design Review
Week 4	Wireframe Revisions, Design Annotations
Week 5	Branding Research, Assets
Week 6	Logo Refinement, Component Library, Mockup Design
Week 7	Mockup Refinement, Design Alignment
Week 8	Prototyping, Landing Page Planning
Week 9	Alpha Testing, Proposal Draft, Landing Page Mockup
Week 10	Proposal, Promotional Assets, Landing Page Coding
Week 11	Presentation, Beta Testing, Landing Page Coding
Week 12	Presentation Dry Runs, Landing page launching
Week 13	Final Presentation

Software

Design

We utilized industry-standard tools to streamline our design process and enhance collaboration. Through hands-on experience with these tools, we improved our workflow efficiency and deepened our expertise in professional design practices.


Figma

Illustrator

InDesign

Photoshop

After Effects

Premiere Pro

Project Management

We applied Agile methodologies to maintain an efficient and adaptive workflow, emphasizing iterative development, continuous improvement, and fast issue resolution. Using Jira, we structured and tracked sprints, monitored progress, and optimized team efficiency through data-driven insights. Slack enabled seamless communication, while GitHub facilitated collaborative development and systematic bug tracking.


Jira


GitHub


Slack

Design Process

Persona

We kicked off the design process with an understanding of our users.

Creating user personas was key to shaping DriveBuddy's design. By identifying key user needs, frustrations, and goals, we ensured our solution addressed real pain points for both drivers and fleet admins. This guided our design decisions, keeping the app practical and effective.

Jack Thompson

Age: 45
Occupation: Long-haul truck driver
Location: Vancouver

Jack Thompson spends 10–12 hours daily on the road, navigating long stretches across states or countries. With years of experience under his belt, Jack is highly skilled but finds the job both physically exhausting and mentally draining due to its demanding nature.

Habits

- Maintains strict driving schedules
- Often drives at night
- Relies on coffee and energy drinks to stay alert

Needs & Goals

- Maximize safe driving hours
- Reduce fatigue-related risks
- Easily locate convenient rest stops with truck parking

Frustrations

- Struggles to stay alert on monotonous routes
- Difficulty finding safe rest stops
- Frustrated by tools requiring constant manual input

Sarah Lee

Age: 34
Occupation: Full-time ride-share driver
Location: Vancouver

Sarah Lee juggles 8–10-hour shifts, often late into the night, with the responsibilities of raising two young children. Tech-savvy and efficient, Sarah depends heavily on apps for navigation, earnings tracking, and maintaining her customer ratings, making technology an essential part of her daily life.

Habits

- Uses playlists and podcasts to stay entertained
- Prioritizes passenger safety alongside her own
- Prefers engaging features to combat fatigue

Needs & Goals

- Stay alert to ensure passenger safety and satisfaction
- Plan efficient rest breaks between rides
- Avoid accidents to prevent financial losses

Frustrations

- Struggles with reduced focus during late-night shifts
- Balancing safety with maximizing earnings during busy periods
- Finds traditional fatigue-monitoring tools intrusive or unreliable

Mark Lewis

Age: 45
Occupation: Fleet Operations Manager
Location: Vancouver

Mark has over 15 years of experience managing a team of long-haul truck drivers for a mid-sized logistics company. He's responsible for ensuring deliveries are made on time while prioritizing driver safety and well-being. With his busy schedule, Mark relies heavily on data and reporting tools to make informed decisions quickly.

Habits

- Monitors driver performance and schedule efficiency
- Balances managing operations with meeting delivery deadlines
- Relies on data dashboards to track productivity and costs

Needs & Goals

- Maximize manpower by assigning the best-suited drivers for each route
- Reduce costs by improving scheduling efficiency
- Mitigate accident risks

Frustrations

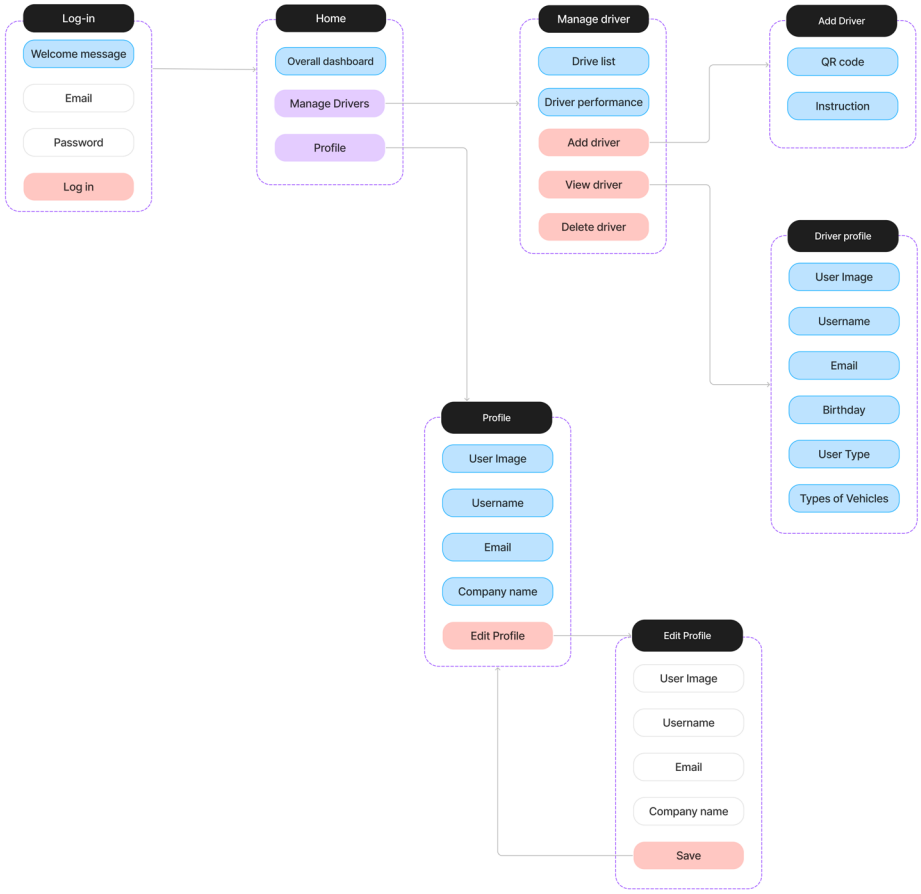
- Struggles to find solutions that integrate smoothly with existing systems
- Pressure to prioritize delivery targets while ensuring driver safety

User Flow

Creating a clear user flow was crucial for aligning the design and development teams. It mapped out the app's core interactions, ensuring developers understood how users would navigate features like fatigue alerts, rest stop suggestions, and the admin dashboard. This streamlined team communication minimized confusion and kept the project on track.

Admin Flow

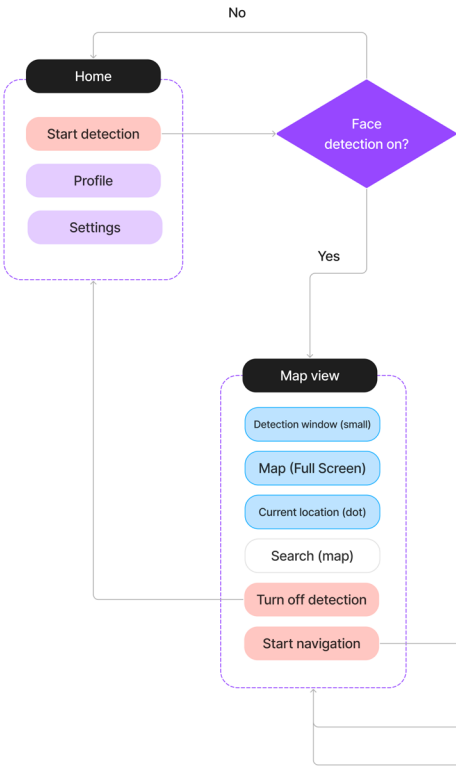
Admin (Web app)



Driver Flow

Start from Detection

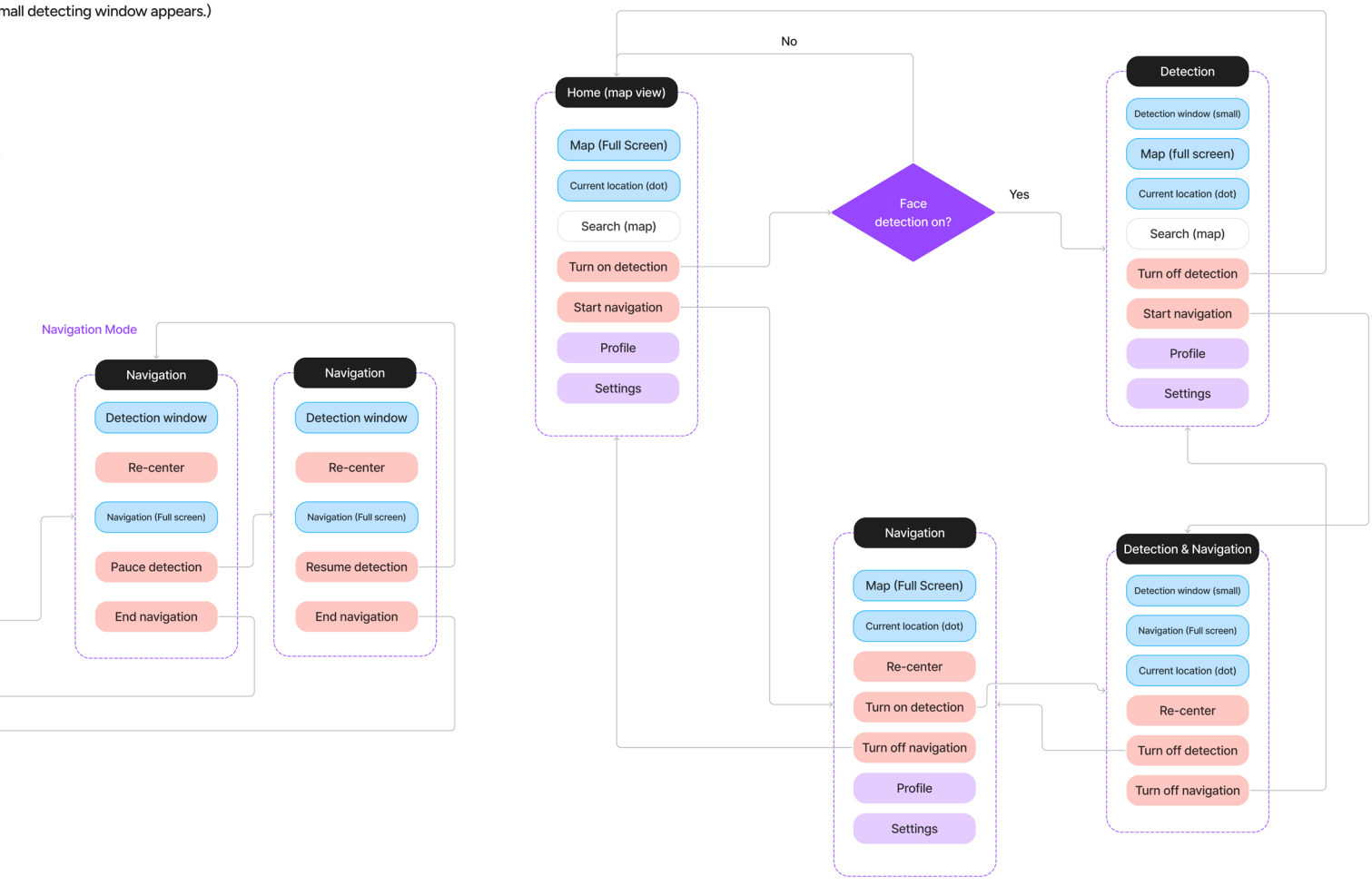
(Once the detection starts, the view switches to the map, and a s



Legend

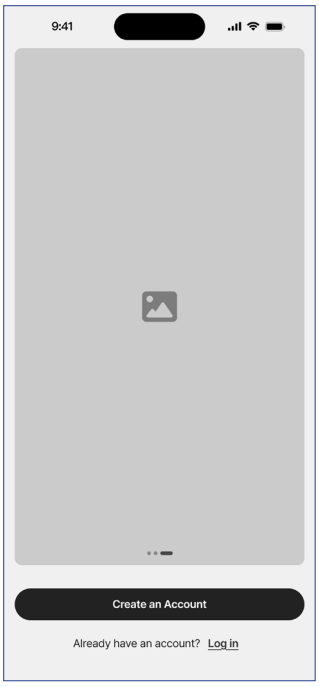
Start from Map View

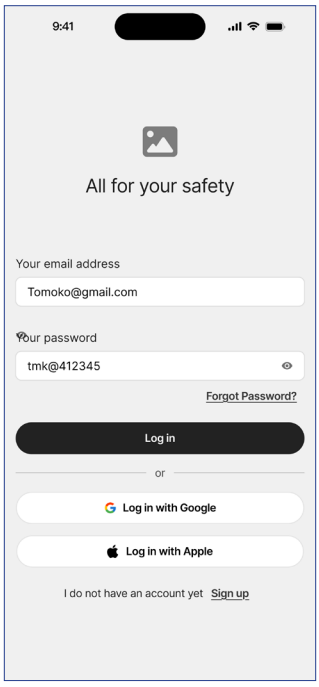
mall detecting window appears.)

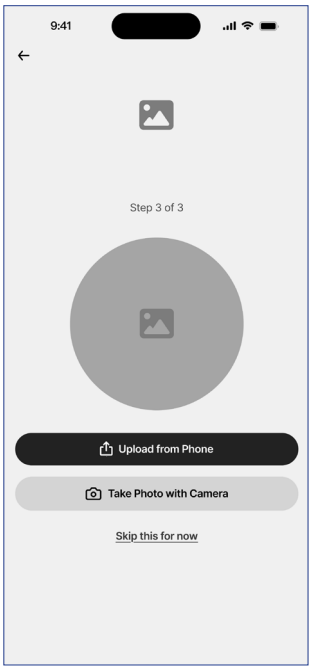


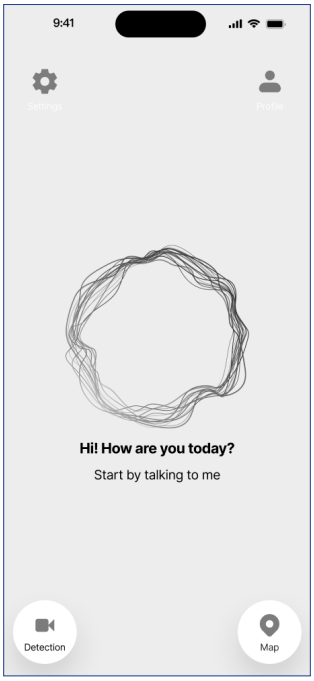
Wireframes

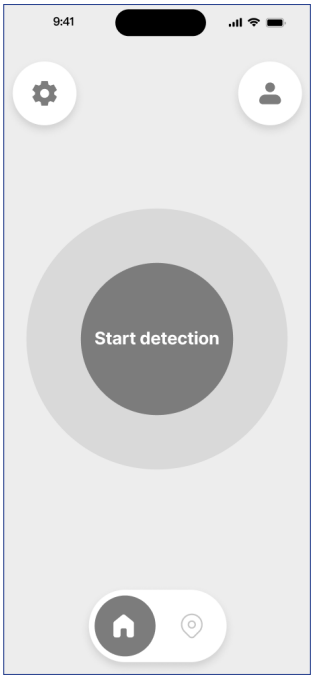
After finalizing the user flow, we created wireframes, reviewed them internally, gathered instructor feedback, and aligned with developers to ensure feasibility. Using a wireframe UI kit, we refined the structure before moving to mockups.

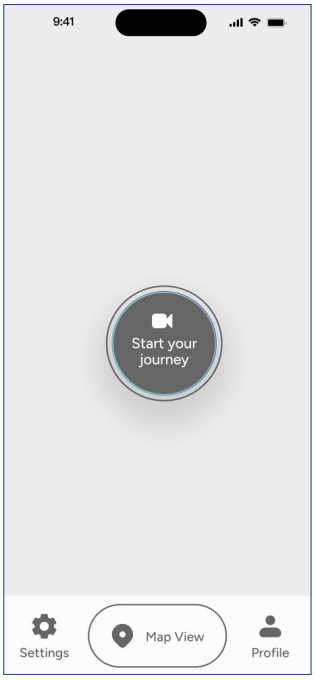




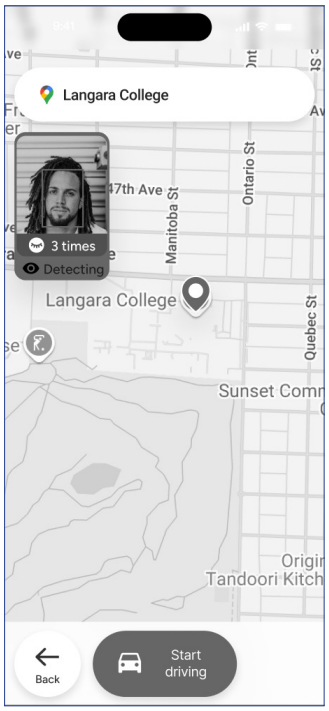


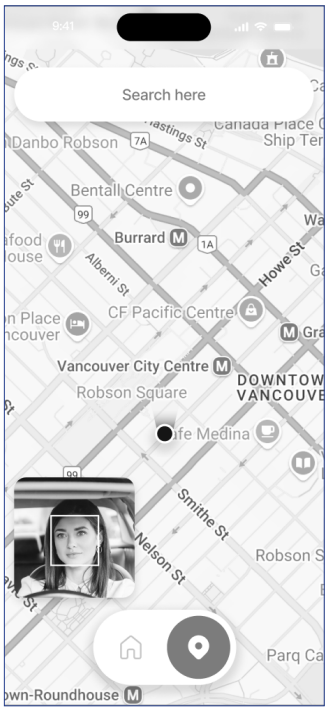




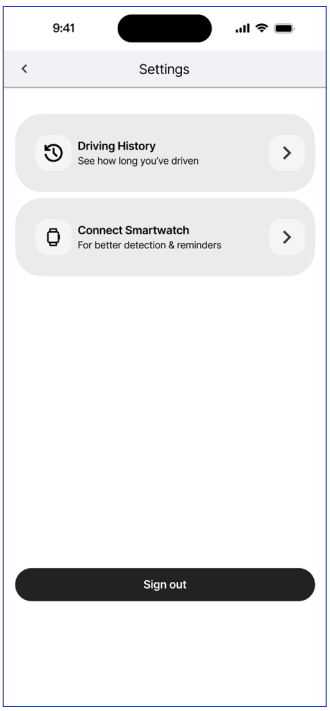


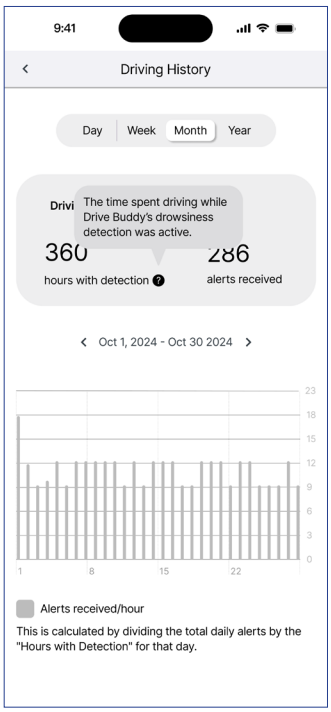
The trials and iterations.

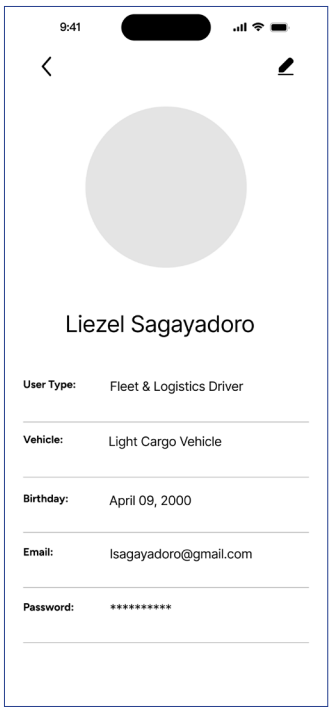

Langara College
3 times
Detecting
47th Ave
Manitoba St
Ontario St
Langara College
Quebec St
Sunset Comm
Origin
Tandoori Kitch
Back
Start driving


Search here
Danbo Robson
Bentall Centre
Burrard
Howe St
CF Pacific Centre
Vancouver City Centre
Robson Square
DOWNTOW
VANCOUVE
Smithe St
Nelson St
Robson S
Parq Ca
own-Roundhouse


9:41
toward Manitoba St
Then
Similar ET
Cambie St
Similar ETA
Re-center
4 min
3 km · 12:13 A
Detection
Exit


9:41
Settings
Driving History
See how long you've driven
Connect Smartwatch
For better detection & reminders
Sign out


9:41
Driving History
Day
Week
Month
Year
The time spent driving while Drive Buddy's drowsiness detection was active.
hours with detection
alerts received
Oct 1, 2024 - Oct 30 2024
Alerts received/hour
This is calculated by dividing the total daily alerts by the "Hours with Detection" for that day.

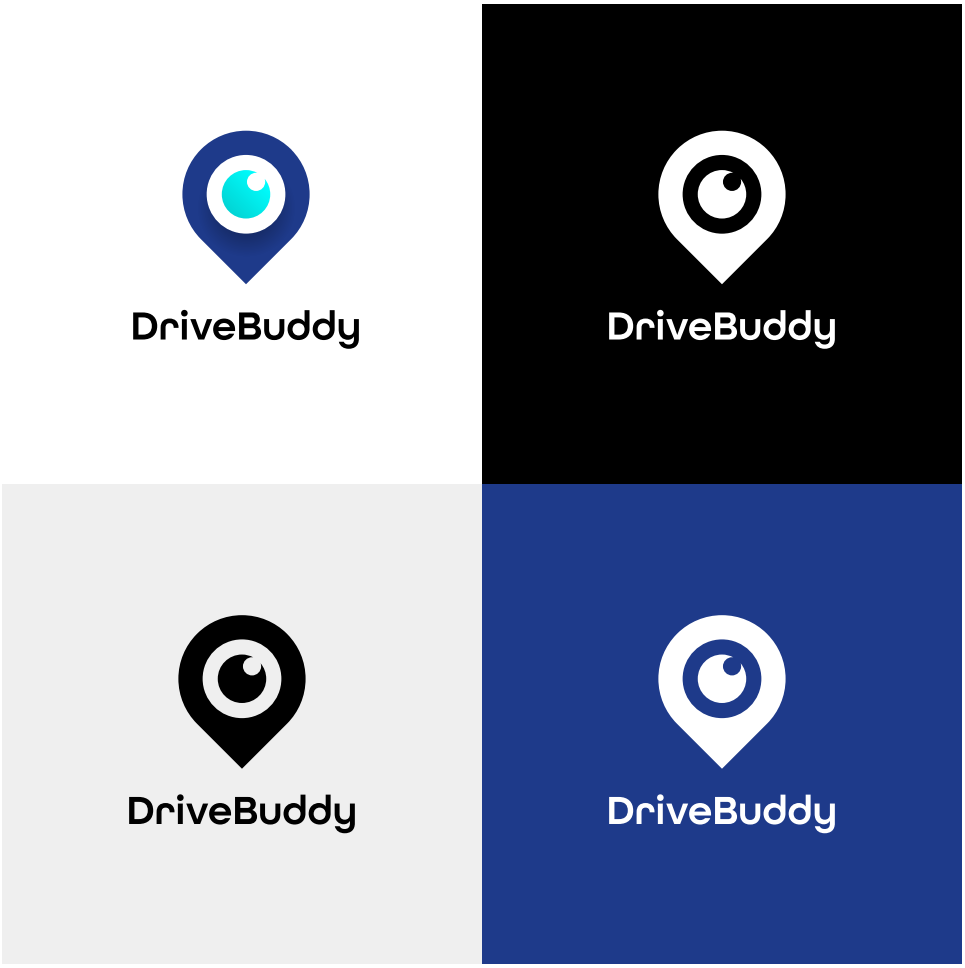

9:41
Liezel Sagayadoro
User Type:
Fleet & Logistics Driver
Vehicle:
Light Cargo Vehicle
Birthday:
April 09, 2000
Email:
lsagayadoro@gmail.com
Password:
****

Logo & UI Kit

We developed branding that reflects our core values, designing the logo, selecting colors, and choosing typography to create a cohesive identity focused on safety, reliability, and ease of use.

Logo

The logo combines a map pin icon with an open eye, representing the app's primary feature - helping drivers stay alert and focused while driving. This design reflects both navigation and vigilance, emphasizing the app's commitment to road safety.



UI Kit

Following the finalization of our branding assets, we developed a comprehensive UI kit and component library. Best practice: One designer typically leads UI kit and design guidelines creation to ensure consistency. Our reality: With a small team (5 designers) and a tight 13-week timeline, we adapted our process:

- Each designer created components for their assigned screens/features.
- We identified overlapping components along the way.
- Held quick meetings to align and update the library.
- This adaptive process allowed us to stay efficient while maintaining design consistency.

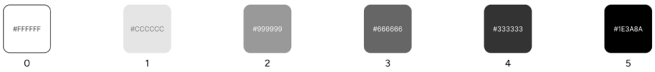
typeface

Figtree

title_bold	title_medium	title_regular title	font size / line height
3xlarge	3xlarge	3xlarge	48 / auto
2xlarge	2xlarge	2xlarge	40 / auto
xlarge	xlarge	xlarge	32 / auto
large	large	large	26 / auto
medium	medium	medium	20 / auto
base	base	base	18 / auto
small	small	small	15 / auto

body_bold	body_medium	body_regular	font size / line height
large	large	large	20 / auto
medium	medium	medium	18 / auto
base	base	base	15 / auto
small	small	small	13 / auto

Colours



Buttons_all

Full width button

Button primary default

Button primary clicked

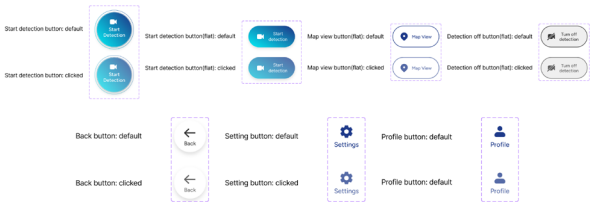
Button secondary default

Button secondary clicked

Button tertiary default

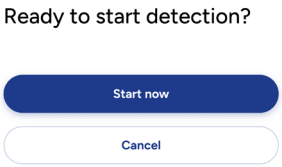
Button tertiary clicked

Buttons_nav-bar



Popups

Popup window
Title & 2 btns



Nav bar_home

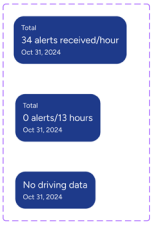
home page

Tooltips

Alerts number

0 alers

No data



Cards_settings

Summary card

Card-Default

Card-Pressed

Card-Default-icon2

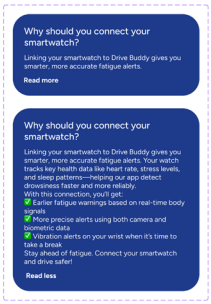
Card-Pressed-icon2

Summary card-default

Summary card-with tooltip

Info card-collapsed

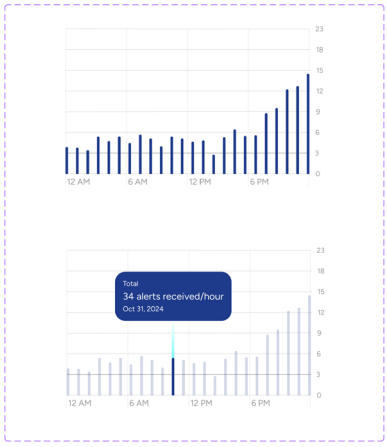
Info card-expanded



Charts_setting

Chart-day

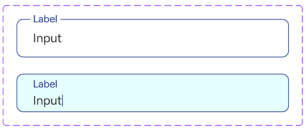
Chart-day-tooltip



Input fields

Input field default

Input field clicked



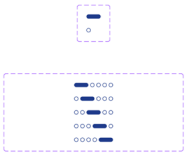
Icons_home

Icons_tooltips

Icons_settings

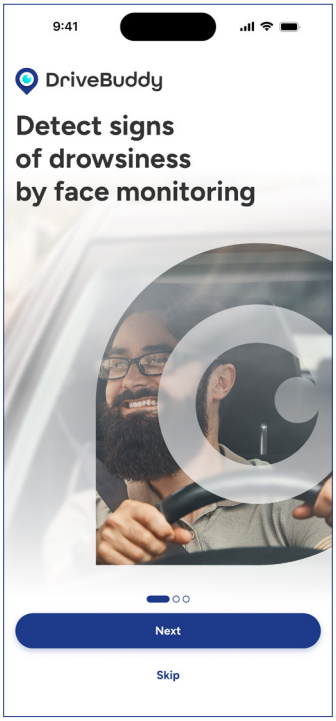
Icons_profile

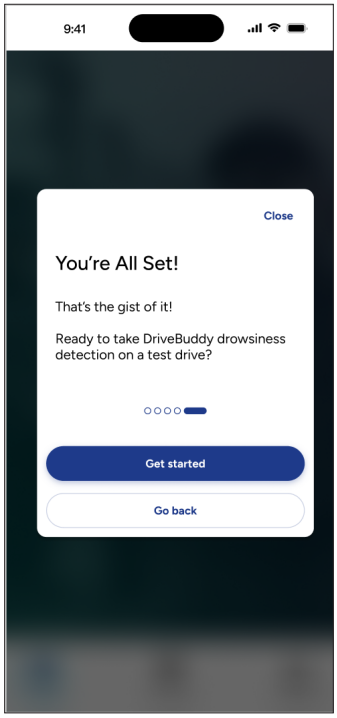
Icons_onboarding

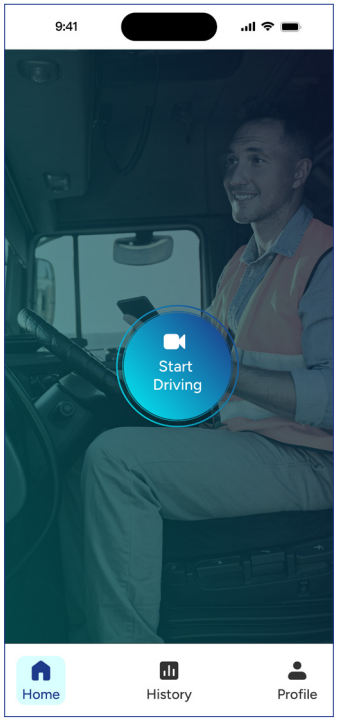


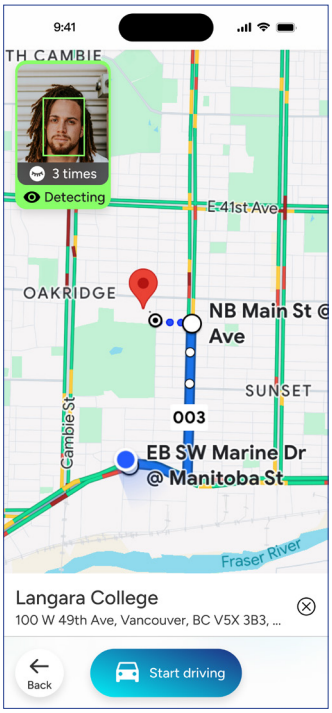
Mockups

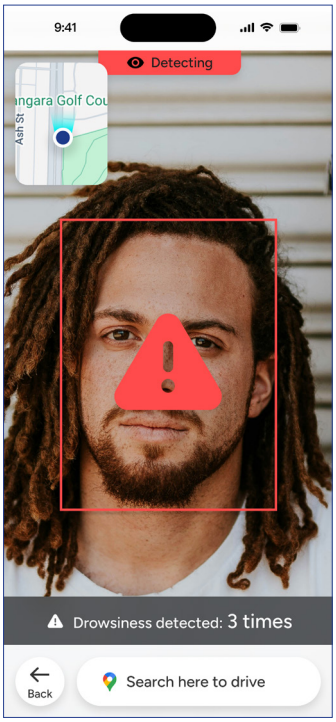
With branding assets and components set, we built mockups while refining the component library for consistency. External feedback, including instructor reviews and usability testing, ensured user needs and technical feasibility.

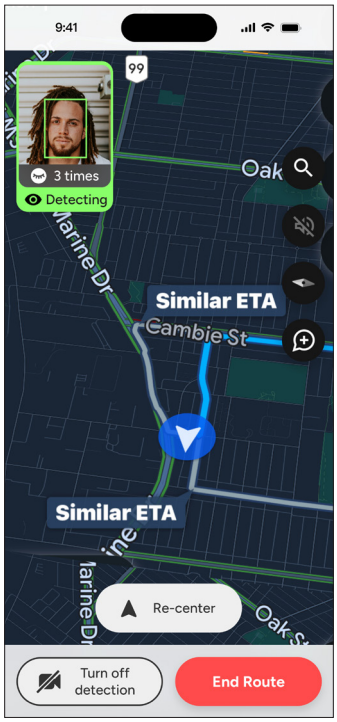


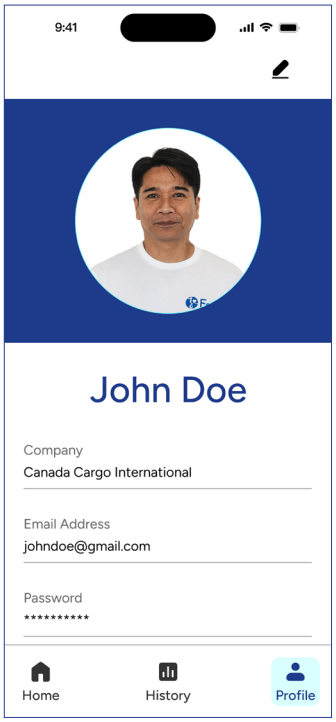


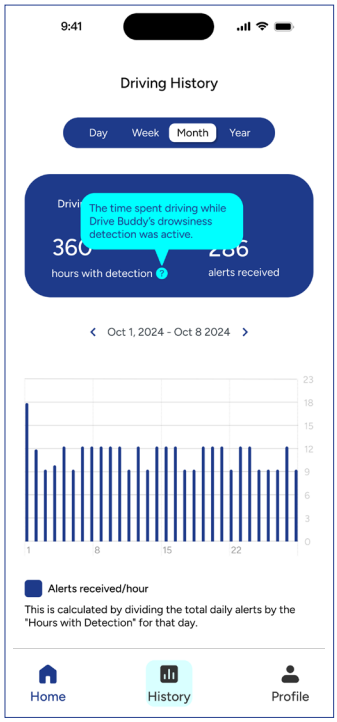


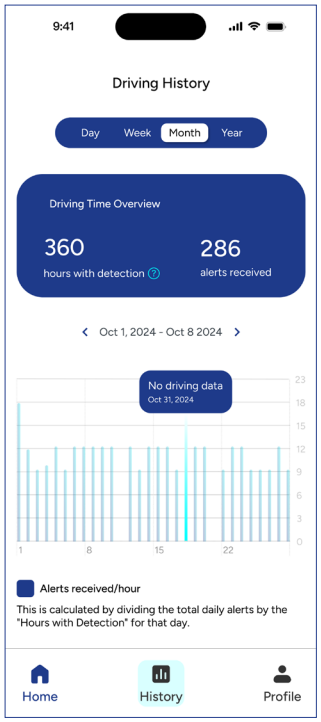


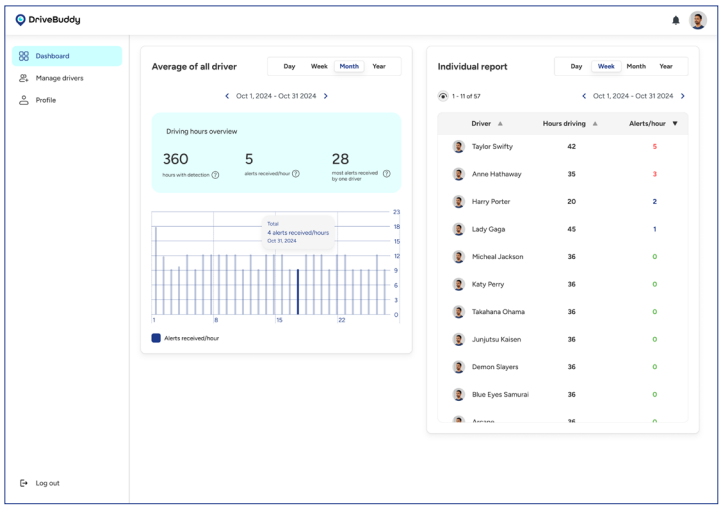


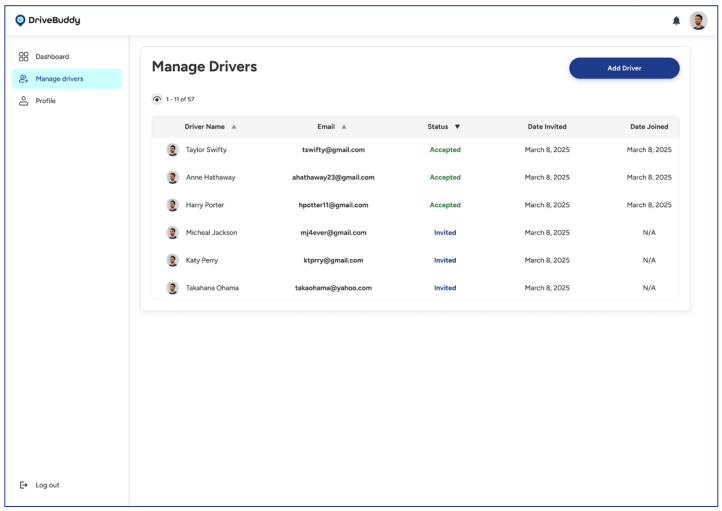



9:41
John Doe
Company
Canada Cargo International
Email Address
johndoe@gmail.com
Password
****
Home
History
Profile


9:41
Driving History
Day
Week
Month
Year
The time spent driving while Drive Buddy's drowsiness detection was active.
360
hours with detection
286
alerts received
Oct 1, 2024 - Oct 8 2024
Alerts received/hour
This is calculated by dividing the total daily alerts by the "Hours with Detection" for that day.
Home
History
Profile


9:41
Driving History
Day
Week
Month
Year
Driving Time Overview
360
hours with detection
286
alerts received
Oct 1, 2024 - Oct 8 2024
No driving data
Oct 31, 2024
Alerts received/hour
This is calculated by dividing the total daily alerts by the "Hours with Detection" for that day.
Home
History
Profile


DriveBuddy
Dashboard
Manage drivers
Profile
Log out
Average of all driver
Day
Week
Month
Year
Oct 1, 2024 - Oct 31 2024
Driving hours overview
360
hours with detection
5
alerts received/hour
28
most alerts received by one driver
Alerts received/hour
Individual report
Oct 1, 2024 - Oct 31 2024
Driver
Hours driving
Alerts/hour
Taylor Swifty 42 5
Anne Hathaway 35 3
Harry Porter 20 2
Lady Gaga 45 1
Micheal Jackson 36 0
Katy Perry 36 0
Takahana Ohama 36 0
Junjutsu Kaisen 36 0
Demon Slayers 36 0
Blue Eyes Samurai 36 0

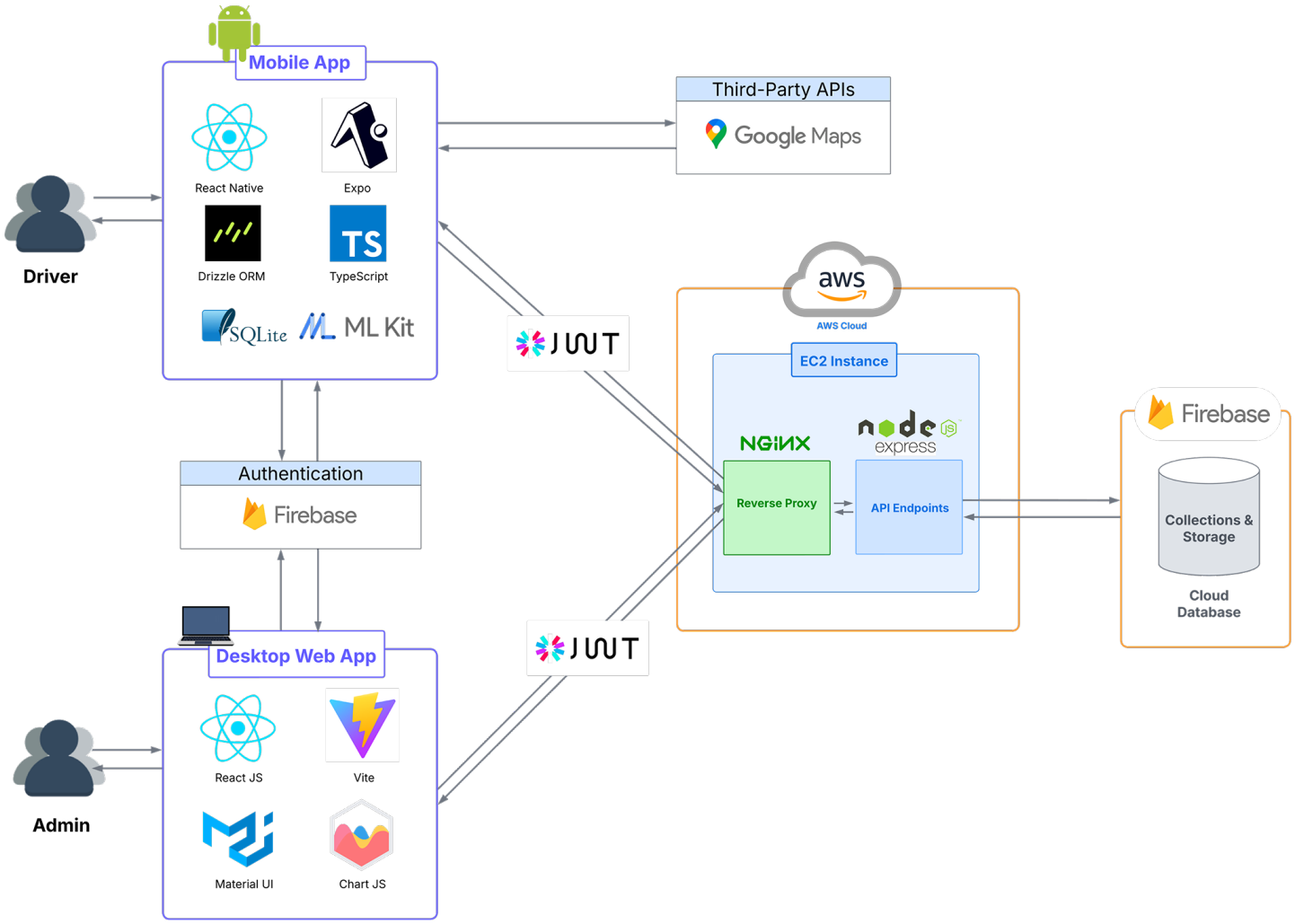

DriveBuddy
Dashboard
Manage drivers
Profile
Log out
Manage Drivers
Add Driver
Driver Name
Email
Status
Date Invited
Date Joined
Taylor Swifty tswifty@gmail.com Accepted March 8, 2025 March 8, 2025
Anne Hathaway ahathaway23@gmail.com Accepted March 8, 2025 March 8, 2025
Harry Porter hpotter11@gmail.com Accepted March 8, 2025 March 8, 2025
Micheal Jackson mj4ever@gmail.com Invited March 8, 2025 N/A
Katy Perry ktprry@gmail.com Invited March 8, 2025 N/A
Takahana Ohama takaohama@yahoo.com Invited March 8, 2025 N/A

Development Process

System Architecture

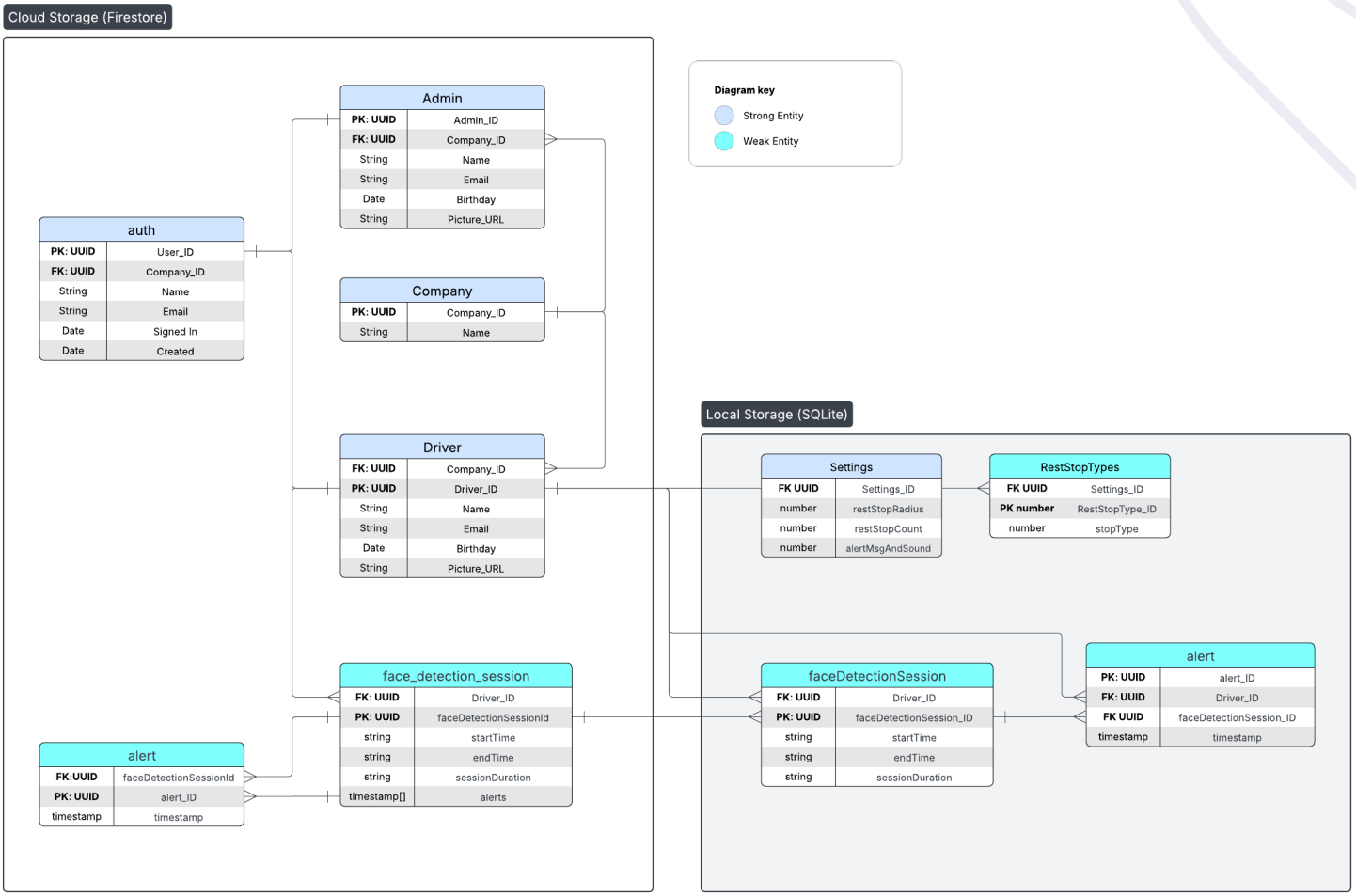
Our system consists of a mobile app and a web platform designed to ensure real-time drowsiness detection and provide actionable insights. The mobile app, built with React Native and Expo, uses the Google Maps API for navigation and Google ML Kit for real-time drowsiness detection.

To handle potential connectivity issues, the app stores detection data locally using SQLite, manages with Drizzle ORM, and syncs it to Firebase once a session concludes. The web platform, developed with React and Chart.js, provides administrators with data visualizations for monitoring and analysis. Both applications communicate with a centralized Express API hosted on an AWS EC2 instance, with Nginx serving as a reverse proxy. JWT authentication is used to ensure secure data transmission. This architecture offers a scalable, reliable, and secure solution for detecting and responding to drowsiness incidents.



Data Model

DriveBuddy uses two databases: Firebase's Firestore and the device's local storage with SQLite. The data generated during the drowsiness detection session is stored first in the local database to decrease the number of API requests and prevent data loss in areas with limited internet connection. When the detection session is finished, our app moves the data in the local tables to Firestore and empties them to avoid taking too much space in the device's storage.



Future Roadmap

For our MVP, we focused on core features to ensure a functional and effective user experience. However, we see great potential for DriveBuddy's growth and are excited to expand its capabilities. Future developments will enhance accuracy, usability, and integration, making the app even more valuable.

AI Companion

Acts as an interactive driving companion that engages drivers in a 2-way conversation, providing mental stimulation that helps them stay awake.

Enhanced GPS Navigator

Future enhancements will include turn-by-turn directions and real time traffic updates.

Enhanced Detection Algorithm

Future enhancements will factor in the speed the vehicle was travelling when detection was triggered.

Smartwatch integration

Collect data such as oxygen levels and heart rate to monitor physical signs of fatigue.

Offline Mode

Allow drivers to continue using features such as GPS Navigation even when they lose internet connection, providing peace of mind during long trips in areas with limited signal.

Meet the Team

Cocoy Suguitan

Full Stack Developer I Project Manager

/in/cocoysg/ cocoysg cocoy.netlify.app

Cocoy holds a degree in Fine Arts and has over 10 years of experience as a multidisciplinary designer, specialising in UX, UI, visual identity, and interaction design. He enrolled in the WMDD developer stream to enhance his design expertise with development skills. In this project, he will support the development team as a front-end developer as well as the PM.

Terumasa Mori

Full Stack Developer

/in/terumori/ terumori1206

Terumasa has around 5 years of graphic design experience. Now he has been learning in the WMDD developer stream to build and grow development skills. In this project, he's in the development team as a member for the frontend development part.

Vinicius Souza

Full Stack Developer I Lead Developer

/in/vinicius-abner/ vinsouza99 vinsouza.vercel.app

Vinicius has over 5 years of software development experience and around 3 years of web development experience. In this project, he's a full-stack developer and the development lead.

Yosuke Hanaoka

Full Stack Developer

/in/yosuke-hanaoka/ yoshan0921

Yosuke has about 20 years of experience as a Software Engineer and Project Manager in the IT industry since 2004, mainly engaged in the development of financial and electric power-related systems. In this project, he is responsible for backend development.

Calvin Tsai

UI/UX Designer

/in/tsai-calvin/

Calvin is transitioning from Digital Marketing to UX Design, with a background in Psychology from UC Irvine. His responsibility as the design lead is to guide our team to create polished deliverables for our developers, establish powerful branding, and develop a comprehensive UI Kit.

Jason Yang

UI/UX Designer

/in/jasonyang-design/ jasonyanguxdesign.com/

With over 5 years of experience as a UI/UX Designer in Taiwan, he remains passionate about the field, with a current focus on AI for UX design. In this project, he will support the design team by applying my experience and be responsible for partly UI/UX design work.

Liezel Sagayadoro

UI/UX Designer

/in/liezel-sagayadoro/

Liezel has a degree in Computer Engineering with 5 years of experience as a Data Processing Associate in the Philippines; now, she has decided to focus on the field of Design. In this project, she will support UI/UX Design and manage data to create features that accurately store and analyze information, ensuring a smooth user experience.

Trang Nguyen Thuy

UI/UX Designer I Lead Designer

/in/trang-tara/

Trang has a marketing degree and five years of experience in brand marketing. Now, she is transitioning into product design, applying her skills to create user-centred solutions that align with business goals. In this project, together with other designers, she is responsible for design-related tasks from research to final design and testing.

Viola Sun

UI/UX Designer

/in/viola-sun-catlady/ viola-sun.ca/

Viola transitioned from translator to UX writer to UX designer, gaining a versatile skill set that helps her understand user needs and create intuitive, impactful designs. She's always been an advocate for end-users, championing their needs throughout her journey. She was responsible for all UI/UX related tasks, from early user research to the final deliverables.

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*All images are used for education purposed only.

Acknowledgments

We extend our heartfelt gratitude to the following instructors and instructional assistants who have guided us throughout this program. Your support, expertise, and dedication have been invaluable in shaping our learning journey. Thank you for inspiring us and equipping us with the skills to bring this project to life.

Tomoko Okochi

Tyler Higgs

Lu Yu

Josué Menjivar

Kevin McMillan

Jason Madar

Reza Abbasi

Amandeep Singh

Reza Etemadi

Paul Brassard

Richard P. Wong

Ira Zhang

Peter Vysek

Jeffrey Ellis

Paul Lam

Sebastian Richardson

Valentina Abanina

Binazir Farokhi

Jacob Tran

Dr. Sean McAlister

Denis Billette

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