Wanderers Web Application Proposal

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Submitted to—
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Executive Summary

Wanderers is a collaborative travel planning platform designed to streamline group trip organization and expense management efficiently. Our project aims to simplify the process of itinerary creation through the integration of features that streamline communication such as transparent budget management system and collaborative editing. With the increasing globalization and digital navigation, a growing number of travelers are opting for free and easy travel. However, they frequently encounter challenges due to fragmentation of different platforms – using Telegram for planning, Splitwise for cost tracking and other apps for reviews and destinations. This complicates the planning process, making potential travelers often context switch between apps and causing loss of motivation of planning for trips. Wanderers addresses these issues through consolidating essential travel planning components into a single user-friendly platform. By offering such convenience features, we aim to ensure a seamless and hassle-free travel experience, from planning to execution, allowing them to focus on enjoying the journey rather than logistics management. Through Wanderers, we seek to fulfil the user's needs of embarking on their adventures with confidence that all aspects of their trip have been well organized and managed.

Statement of Problem

Planning group trips can often be a stressful and inefficient process. Travelers, especially when in a group, rely on multiple fragmented tools such as messaging apps, spreadsheets, and third-party booking sites to handle various aspects of the trip, such as accommodation, finances, schedule planning and communication, to name a few. Using multiple fragmented tools often leads to miscommunication, budgeting issues, and logistical confusion. Furthermore, managing shared expenses among group members is often cumbersome, requiring manual tracking and calculations that can result in disputes and misunderstandings.

Without a unified system for travel management, these fragments operate in solos, leading to limited interoperability. As a result, users spend a significant amount of time switching between these apps, waiting for feedback from others on a potential item, finding places to go, the list goes on. This causes the planning time to sometimes extend beyond the intended departure date or take up a considerable amount of time.

Additionally, there has been a significant shift in social trends with the rise of free and easy travel. It is no longer uncommon to go on a trip with a bunch of strangers met during school semester exchange or in the middle of a solo trip. The birth and success of local companies such as Sotravel highlights the strong appetite for social adventures as a community in Singapore. When travelling with new people, the planning process becomes even more daunting.

These social shifts and the general rise of travelling highlight the clear need for a comprehensive, collaborative platform. Wanderers addresses the problem of constructing an all-in-one solution that simplifies itinerary coordination, centralizes group discussions, and automates cost-sharing, ultimately enhancing travel experiences, especially for groups.

Objectives

This document proposes the design of a collaborative travel planning app with the following specific objectives:

(1) **Integrated Trip Planning:**

The primary objective is to design and develop an intuitive travel planning interface that focuses on ease-of-use and accessibility, allowing users to input travel plans and itemize costs even with minimal technical experience. However, although we would support rich text and image uploads for itinerary details, it will not extend to developing a full-fledged travel booking system, which remains outside the current scope.

(2) **Collaborative Editing:**

The secondary objective is to incorporate interactive elements such as collaborative editing and cost-splitting functionalities. These features are intended to enhance user engagement and facilitate collaboration, allowing users to invite others to contribute to or modify itineraries. However, while the design will include these interactive features, it will not support complex real-time collaborative editing or advanced machine learning algorithms for itinerary recommendations at this stage.

(3) **Enhanced Social Interaction:**

The third objective is to foster a sense of community among travelers in the same itinerary by integrating social features such as live chatrooms and the ability to see other traveler's profiles. These features allow users to share insights and recommendations in text directly within the app and connect with fellow travelers. However, the current scope will not include advanced social networking functionalities such as extensive third-party social media integrations (i.e. connecting of Instagram, Pinterest to show their pictures from social media)

Technical Approach

We have segmented this section into 4 parts: customer needs, target specifications, technology considerations and the system architecture. In each section, we will go more into detail our considerations and action items.

Customer Needs

Given the increasing demand for collaborative travel planning, we focused on understanding the challenges faced by travelers when organizing group trips. Users often experience difficulties in coordinating itineraries, tracking shared expenses as well as ensuring seamless communication amongst themselves. Some members of the group have also faced similar difficulties while travelling, which led to our key findings of three customer needs in the subsequent paragraphs.

Firstly, users require a centralized platform where they can create and modify itineraries in real-time. Traditional methods such as excel spreadsheets and messaging apps lack the dynamic collaboration features necessary for efficient trip planning, especially in a group setting. By enabling live updates and shared access, Wanderes aims to provide an interactive solution that streamlines any itinerary adjustments and discussion.

Secondly, many travelers resort to external messaging apps to discuss plans which leads to fragmented conversation and potential miscommunication. Wanderes integrates a discussion room feature, allowing users to communicate within the same platform while making itinerary adjustments. This feature ensures that all members are informed of changes without having to switch between multiple applications.

Thirdly, tracking shared expenses is a significant point for group travelers. Managing contributions for flights, accommodation and other costs manually can lead to confusion and discrepancies. To resolve this, Wanderers incorporates a split-budget system inspired by Splitwise, enabling users to input travel expenses and automatically distribute costs among members. This eliminates the need for manual calculations and ensures transparency within the group.

By addressing these core needs, Wanderers offer a one-stop user friendly solution for planning domestic and international trips. The combination of real-time itinerary collaboration, built-in discussion rooms and an integrated expenses-sharing system ensures that users can plan and manage their travel experiences with ease.

Target Specification

- **Real-Time Collaborative Itinerary Planner** – Users can create, edit, and modify trip details dynamically, with instant synchronization across group members and notifications for updates.

- **Integrated Discussion Room** – Built-in messaging for trip discussions, eliminating the need for external apps, with future enhancements for file-sharing and media attachments.

- **Split-Budget System** – Tracks and divides shared expenses automatically, ensuring transparency and simplifying reimbursement among travelers.

- **Multi-Platform Synchronization** – A clean, user-friendly and responsive design for seamless access across mobile, tablet, and desktop, with secure real-time data storage.

Technology Consideration

The Wanderers application will follow stable and modern technologies to push features quickly while also ensuring new developers can onboard easily without a steep learning curve.

Technology	Purpose/Usage	Summary
Next.js	Web Development Framework	A modern React framework that utilizes components to efficiently render web pages, offering server-side rendering and static site generation for enhanced performance.
Express	Backend server	A web framework built on top of Node.js, designed to create robust backend servers and APIs with flexible routing capabilities.
Supabase	Database and Storage	Provides Postgres (ACID compliant) and S3 Object Storage for hosted environments (staging and production).
Python	Release Automation	Python files are easily scriptable and can provide automation easily while being cross platform independent through virtual environments, allowing us to

		build our release automation (i.e. creation of releases, build and deploy, tagging of commits)
Prisma ORM	Object Relational Mapper	Node.js and TypeScript ORM which supports data modelling, automated migrations, type-safety, and auto-completion for reliable data management
GitHub Actions	Continuous Integration/Continuous Delivery	A tool built into GitHub repositories to manage Continuous Integration/Continuous Delivery pipelines for enabling automated testing, building and deployment of applications.
Google Maps/Places API	Provide information to places through the world	The Places API is a service that accepts HTTP requests for location data through a variety of methods. It returns formatted location data and imagery about establishments, geographic locations, or prominent points of interest.

Table 1: Technology and summary

System Architecture/Platform

Wanderers will adopt the 3-tier architecture consisting of the user interface, application layer and the data layer. Each tier can be managed separately and independently and can be updated and scaled without impacting the other tiers. All communication will go through the application layer as shown below in the System Architecture Diagram.

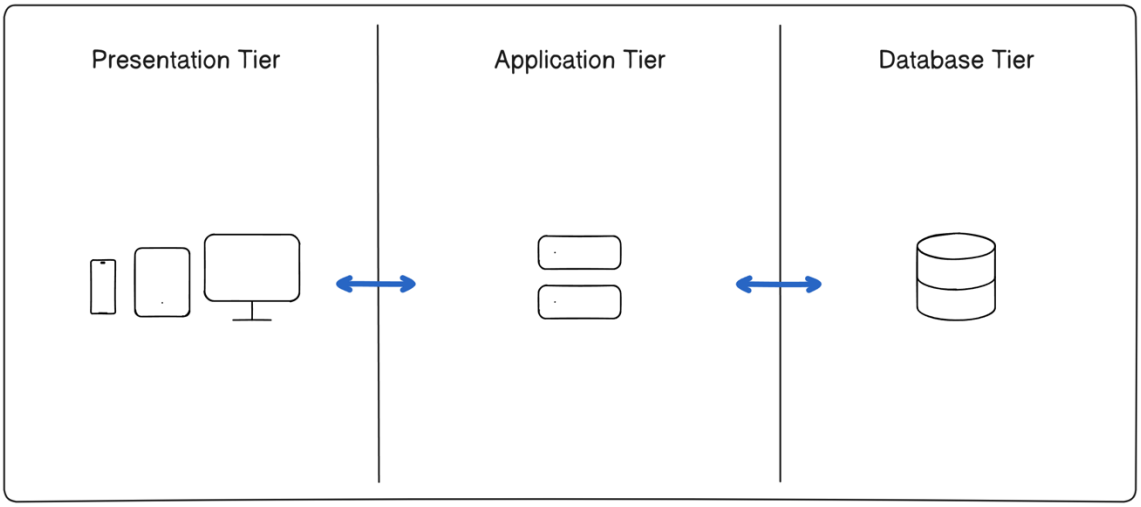

Figure 1: Three-tier architecture

- The **presentation** tier is Next.js, rendering its HTML, CSS and JavaScript content to the users in a minified and pretty format. It communicates with the application tier using APIs.
- The **application** tier corresponds to Express JavaScript Web Framework, handling the business logic as well as processing user inputs. This tier will also query the database layer to return Itinerary details and display the user profile details.
- The **database** tier houses the database management software. In our application, we will use Supabase to facilitate storage of relational data and objects such as photos.

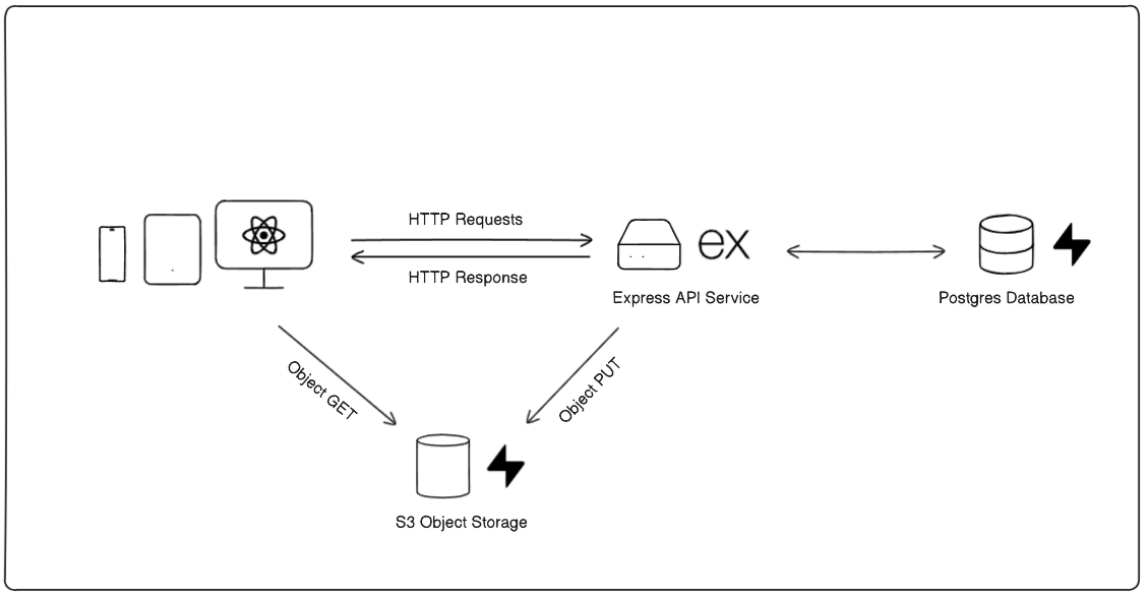

Figure 2: System Architecture Diagram

We will utilize the following tools onto of our development tools to aid our requirements gathering, design and speed up development.

Development Tools	**Purpose**	**Description**
Git	Version Control	Version Control system to help track and manage software code across the team.
Jest	Testing	Testing of front-end and back-end services.
SonarQube	Code Quality Scanner	Ensures code coverage and best coding practices.
Swagger	API Documentation	Provides API documentation for QA and development team.
Docker	Containerization	Speeds up local development and testing, ensuring the team is using the correct environment setup. We can deploy mock services such as MinIO (S3-compatible) to test images locally.
shadcn/ui	Frontend Styling	Reusable component and styling library
Jira	Backlog and issue tracking	Allows bug tracking, issue tracking and agile project management
Visual Paradigm	Use case diagrams	Draft use case diagrams
eraser.io	General purpose diagrams	Design System Architecture diagram

Table 2: Development tools to aid wanderers' development

Project Management

For this project, we will follow the Scrum project management framework for the planning and delivery of our project requirements. In terms of timeline – we will be following a sprint cycle of two weeks with the following ceremonies:

1. **Sprint Planning**: 15 minutes per lab (10:45am-11:00am)
    a. To plan the tickets and features that we plan to work on top of lab deliverables for product

2. **Sprint Grooming**: At least one post lab meeting in the sprint (typically the first Thursday one week into the sprint)
    a. To resize and replan tickets, reassignment of duties, dropping of duties if timeline is tight, planning of future tickets we intend to take next sprint.

To facilitate the tracking of tickets and timelines, we will use JIRA for project management, with the following rules:

1. A **ticket (task)** should be created for each deliverable/feature
    a. A **task** should be clearly defined with a description, steps and acceptance criteria.
    b. A **task** should be as small as possible, if there are too many steps, it should be broken into two (or more) tasks

2. A main feature such as something that encapsulates many sub features (i.e. implementing interactions between database and frontend) should be an **Epic.**
    a. All **tasks** (mentioned in point 1), should be a child of this **Epic** for clear visibility of an **Epic's** progress by the **Project Manager**.

3. All use case descriptions written should have a **User Story** created in JIRA, and each task needed to achieve the **User Story** should be added as a **subtask**.

The subsequent images are the tools that JIRA provides to track project deliverables.

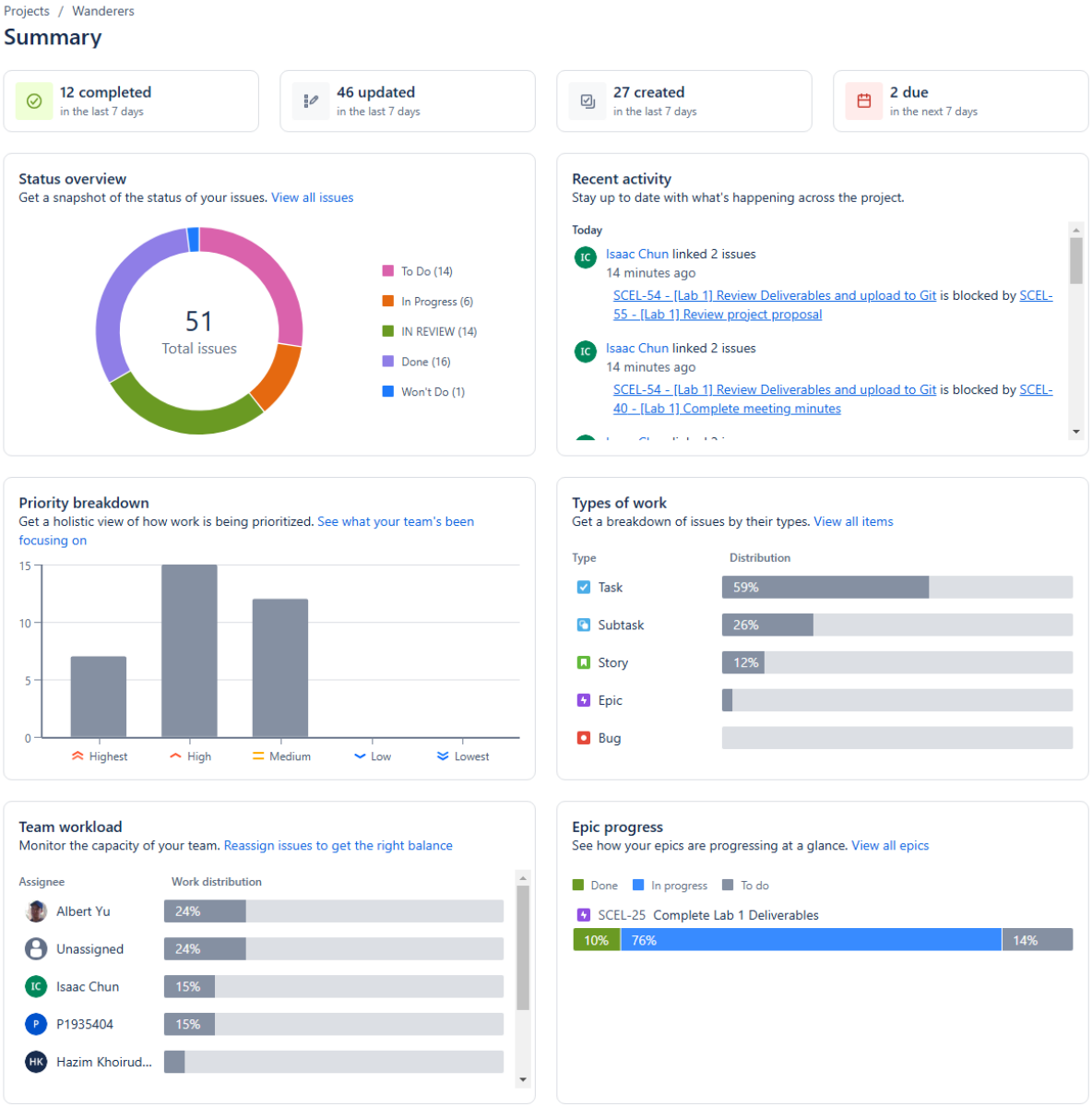

Figure 4: Dashboard for overall progress of Wanderers

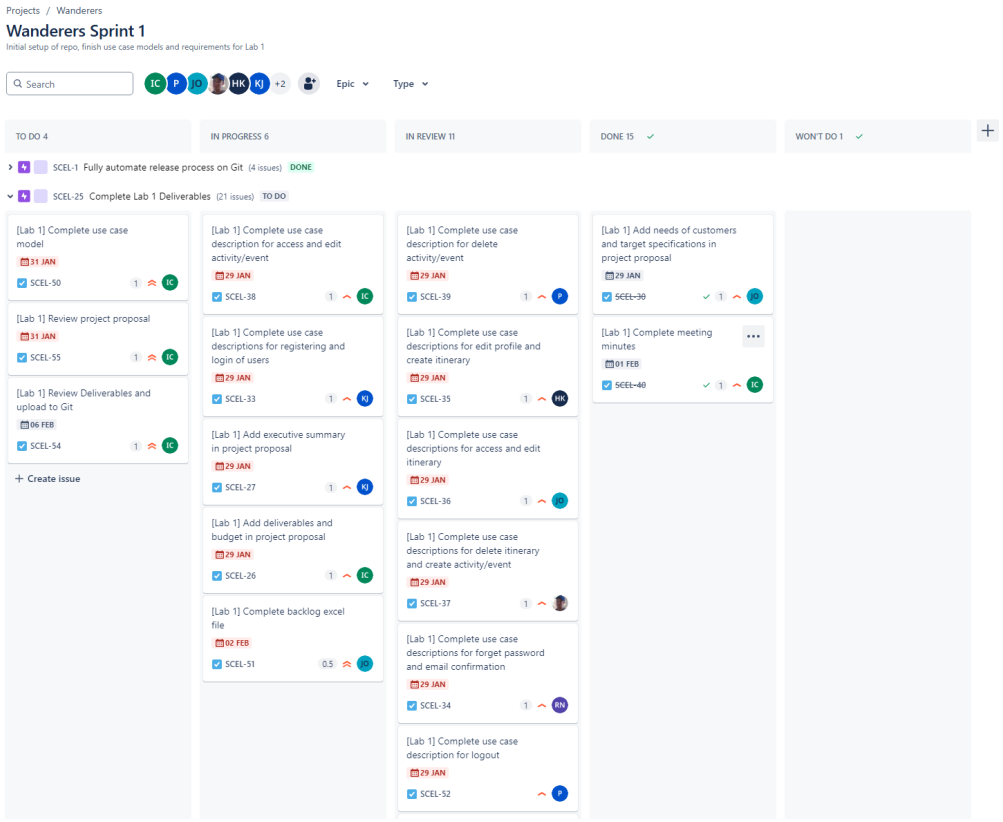

Figure 5: Sprint view for tracking of individual tasks

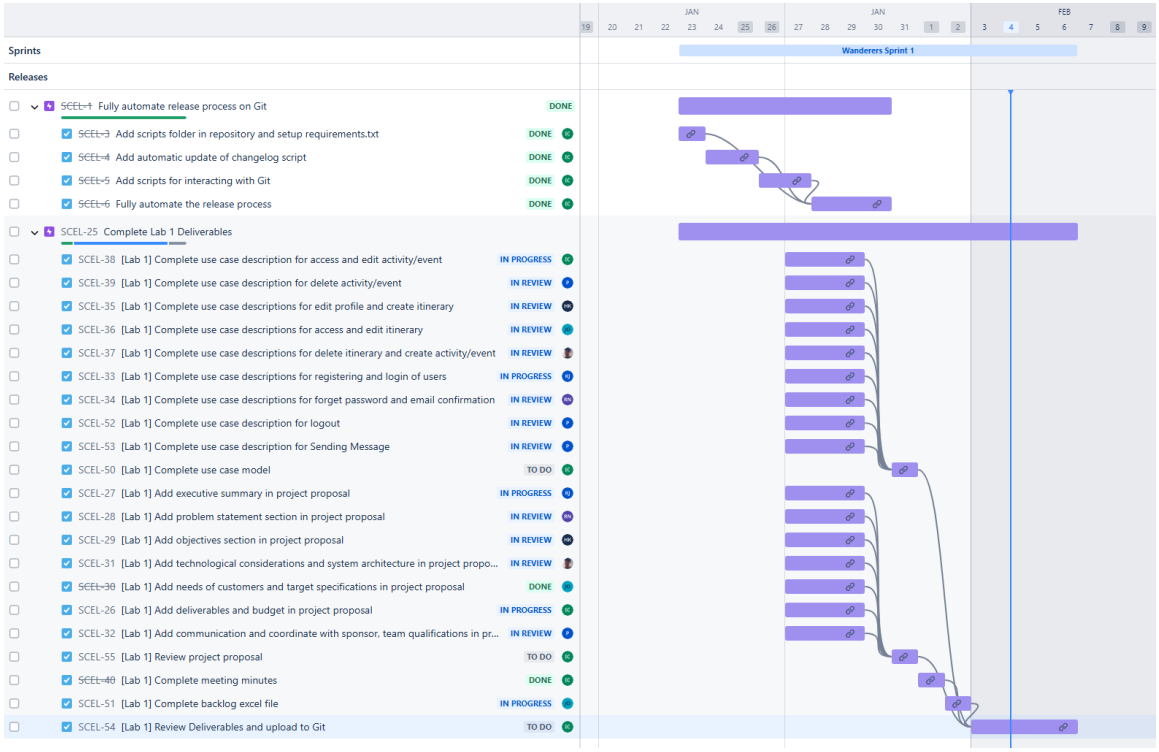

Figure 6: View of potential blockers of items and timeline

Deliverables

The table listed below outlines the deliverables for each lab and their expected final deadline. All these dates are subject to changes and not final depending on sponsor requirements or internal team requirements.

Deliverable	**Description**	**Estimated Completion Date**	**Final Deadline**
Project Proposal	Outlines the problem to be solved and explains the resulting benefits to the customer or the general public	04/02/2025	05/02/2025
Use Case Descriptions	To describe how a system can be used to achieve specific goals or tasks	01/02/2025	05/02/2025
System Requirement Specification	This document defines the goals, objectives and strategies of the application and gives detail to the requirements, constraints and main features	17/02/2025	19/02/2025
Quality Plan	This document outlines the standards and practices for ensuring our application's overall quality meets standards through good quality assurance and control	17/02/2025	19/02/2025
Project Plan	A plan for project scheduling and rough time estimations of each	03/03/2025	05/03/2025

	task for resource allocation, in the form of a burndown chart		
Risk Management	Identify the possible risks during the project development, prepare the risk management strategies	03/03/2025	05/03/2025
Code Prototype	This is the main code of Wanderers at the point of prototype	04/03/2025	05/03/2025
Video, Document Prototype	Video clips and documents prototype needed for the project demo	04/03/2025	05/03/2025
Design report on software maintainability	Document that outlines any discussion of improving the maintainability of our design, such as test-driven development, use of architectural patterns, etc.	17/03/2025	19/03/2025
Change Management Plan	Document that outlines the way for version control and change of process workflow	17/03/2025	19/03/2025
Configuration Management Plan	Document that outlines the baseline of the project and the roles and procedures for change management	17/03/2025	19/03/2025
Release Plan	Provides our release process with items on the	17/03/2025	19/03/2025

	following: what is considered a release, what is done during release, etc		
Making of Presentation Slides	Slides to showcase Wanderer's progress throughout the semester	31/03/2025	02/04/2025
Test Plan	Document that outlines the different tests (functional, non-functional test, etc.)	31/03/2025	02/04/2025
Test Case and Requirements Test Coverage Report	Document that outlines the results of test and total test coverage of Wanderers	31/03/2025	02/04/2025
Final Documentation	All documentation and code are uploaded into the SC3040 SCEL repository	31/03/2025	02/04/2025

Table 3: Deliverables and deadlines

Budget

The table listed below outlines the monthly breakdown of the costs of Wanderers.

Item	Supplier	Quantity	Unit Price ($)	Total ($)
Project Proposal	N/A	1	6,000	6,000
Software Developer (Front-end and Back-end)	N/A	4	5,000	20,000
QA/Release	N/A	2	4,800	9,600
Laptop	Apple	7	2,000	14,000
Office Rental	NTU	1	2,000	2,000
Welfare	N/A	7	$50	350
Tools	N/A	As listed above in technologies used	0	0
			Total	**51,650**

Communication and Coordination with Sponsor

Effective coordination and communication with our sponsors are paramount to the success of Wanderers. We intend to have the culture of having regular and transparent interactions to ensure that the team is aligned with the sponsor's expectations. As such, we plan to have biweekly meetings, subject to our sponsor's availability to discuss the following key topics:

1. Progress from the past sprint
2. Changes in requirements
3. Dashboard and discussion of the overall progress of Wanderers
4. Any changes in requirements
5. Any other important key topics.

Additionally, we will maintain communication through email or a dedicated messaging platform for quick updates and resolution of any issues the sponsor might face. Through the formation of a close and collaborative relationship, we ensure that trust and transparency is maintained with our sponsor, propelling Wanderers in the right direction ethically and ensuring our objectives are met efficiently.

Team Qualifications

Name	Experience
Yu Zi Hao Albert (Dev Lead, Back-end Developer)	Albert has developed a web-based search module in a large-scale Command & Control system, enabling efficient information retrieval across all modules by 25%. He has also implemented a smart information retrieval service using data ingestion tools, natural language processing and machine learning tools for unstructured data, allowing users to retrieve information 50% faster.
Isaac Chun Jun Heng (Release Manager + QA Manager)	Isaac has industry experience in DevOps, where he previously spearheaded development of a Jenkins pipeline one-click service, automating and accelerating the release process for Autodesk Licensing components while engineering an automated release notes generation tool to ensure uniformity and accuracy across all future Autodesk release notes.
J'sen Ong Jia Xuan (Front-end Developer)	J'sen has redesigned an outdated e-commerce website UI, improved user engagement and helped increase sales by 18%. He has also developed a progressive web app (PWA) for a retail store, reducing load time by 40% and enhancing mobile user experience. He has implemented OAuth 2.0 authentication in a SaaS application, enhancing security and enabling single sign-on (SSO) for enterprise users.
Kim Seo Jin (Project Manager)	Seo Jin has built a predictive maintenance model using time-series forecasting, reducing machine downtime by 20%. She has implemented a sentiment analysis tool for social media data, analyzing 1M+ tweets daily for brand management. She has designed an A/B testing framework for an e-commerce platform and increased conversion rates by 12%. She has

	automated data pipeline orchestration using Apache Airflow, reducing data processing latency by 35%.
Hazim Khoiruddin (Back-end Developer)	Hazim has developed a voice-controlled virtual assistant using NLU and speech synthesis, enabling hands-free operation for visually impaired users. He has built a real-time anomaly detection system for network security using unsupervised learning, reducing security breaches by 30%. He has helped optimize SQL queries and database indexing strategies, leading to a 60% improvement in query performance for a high-traffic web application.
Raghav Rajendran Nair (Release Engineer + QA Engineer)	Raghav Rajendran Nair has built a serverless backend using AWS Lambda and DynamoDB, reducing infrastructure costs by 50%. He has contributed to integrating a real-time collaborative editing feature in a web app using WebSocket, improving team productivity. He has developed a real-time fraud detection system for financial transactions via ensemble learning. It has helped to improve fraud detection rates by 25%.
Leong Mininn Miko (Front-end Developer)	Miko has developed a UI that allows users to search for relevant information and view recommended results via React.js. She has managed the backend to communicate data from frontend's calling to MongoDB database via Django. She has experience in game design via Unity as she has coded and modified 6-7 different functions for 3-4 game features with C# and created 4 soundtracks and 6 art assets for the game.

Conclusion

In conclusion, Wanderers attempts to fill the gap and ease the issues faced by many travelers when planning for a trip. This daunting task now should be manageable, if not fun when planning with Wanderers. With Wanderers, we aim to revolutionize travel planning, as it should never be a hassle, but something to look forward to.

Appendix A:

Résumés of Team Members

The following pages present one-page résumés of the team members for this project.

Albert Yu | **Mobile: +6581136652 | LinkedIn: www.linkedin.com/in/albertyuzh | Email: albertyzh@gmail.com**

EDUCATION

Nanyang Technological University, Singapore Aug 2022 - Dec 2025
Bachelor of Computer Science
- SCSE IT Sub Committee (AY 23/24)
- IEEE Student Club - Tech Officer (AY 22/23)

Nanyang Polytechnic, Singapore Jan 2017 - Dec 2020
Diploma in Information Technology
- Director List for AY 18

WORK EXPERIENCE

Accenture Jul 2024 - Dec 2024
Application Developer Intern
- Conducted User Acceptance Testing (UAT) to ensure test cases were met, utilizing extensive knowledge of Microsoft SQL Server and the Microsoft Azure suite for debugging and data analysis.
- Created and managed Kafka topics using Terraform to support application development.

Home Team Science and Technology Agency May 2024 - Jul 2024
Product Manager Intern
- Conducted user interviews and surveys to identify pain points and requirements for the Approval of Requirement (AOR) documentation process, informing the development of the AOR Buddy tool.
- Created and maintained the Product Requirements Document (PRD) for AOR Buddy, detailing product vision, key features, user stories, and acceptance criteria to guide development and ensure alignment with user needs.
- Participated in Scrum events, including Sprint Planning, Reviews, and Retrospectives, to manage the product development lifecycle, track progress, and integrate feedback for continuous improvement.

Scratchbac May 2022 - Aug 2023
Software Engineer (Backend) Intern
- Created a Telegram Bot to provide seamless communication for 5000 users.
- Implemented State Management using fsmx to enhance application reliability and maintainability.
- Implemented a 3 stage: Producer-ProducerConsumer-Consumer system to effectively handle API rate limiting

Defence Science and Technology Agency Sep 2019 - Feb 2020
Software Engineer Intern
- Developed a web-based search module in a large-scale Command & Control system, enabling efficient information retrieval across all modules by 25%.
- Implemented a smart information retrieval service using data ingestion tools, natural language processing and machine learning tools for unstructured data, allowing users to retrieve information 50% faster.

CERTIFICATIONS

- AWS Certified Solutions Architect Associate (SAA)
- Cisco Certified Entry Networking Technician (CCENT)

TECHNICAL SKILLS

- Cloud Infrastructure Technologies: AWS (Amazon Web Services), Azure DevOps
- Programming Languages: Python, C, Java, JavaScript (Node.js), Elixir
- Web Development: HTML, CSS, React
- RESTful API Development
- Database Management: MongoDB, MySQL, PostgreSQL, NoSQL

PROJECTS

Ecommerce Store Jan 2024 - Feb 2024
Software Engineer
- Launched a self-hosted WordPress and WooCommerce software using Raspberry Pi.
- Streamlined deployments and simplified management on Ubuntu by leveraging Docker containerization and NGINX Proxy Manager.
- Secured the application with end-to-end SSL certificates through Cloudflare integration.

Isaac Chun Jun Heng

+65 88699323 | https://github.com/isaacchunn | linkedin.com/in/isaacchunn | isaacchunnbusiness@hotmail.com

EDUCATION

Nanyang Technological University, Singapore Aug 2022 - Dec 2025

Bachelor of Computing in Computer Science

- Relevant Coursework: Data Structures and Algorithms, Operating Systems, Object Oriented Design and Programming, Algorithms Design and Analysis

Nanyang Polytechnic, Singapore Apr 2017 - Feb 2019

Diploma in Game Development and Technology with Merit, 3.88

- Director's List – 2017/2018 Semester 2
- Director's List – 2018/2019, 2019/2020 Semester 1 - 2

EXPERIENCE

Autodesk Jan 2025 – Present

Software Engineer Intern, Licensing Installer UI and Platform Team

- Optimized continuous integration testing by running targeted smoke/regression tests based on changed files in each feature branch, deprecating running all fast tests per commit to reduce CI check times and redundancy in open PRs.
- Spearheaded the development of a full stack tool designed to parse encrypted internal/customer log data, generate reports and give potential fixes and analysis to errors using supervised learning and neural network techniques.
- Developed features for Autodesk Licensing Installer component.

Autodesk May 2024 – Dec 2024

Software Engineer Intern, Daedalus DevOps Team

- Spearheaded development of a Jenkins pipeline one-click service, significantly automating and accelerating the release process for Autodesk Licensing components.
- Engineered an automated release notes generation tool, streamlining the creation process and ensuring uniformity and accuracy across all future Autodesk Licensing component releases.
- Initiated and conducted thorough code reviews, enhancing the integrity, quality, and reliability of Autodesk Licensing components.

PROJECTS

Park in Peace Aug 2023 - Nov 2023

Software Developer

- Developed a user friendly mobile application for efficient access to real time data of 1000+ parking lots in Singapore.
- Fostered a collaborative and inclusive team environment, leveraged strengths of developers to increase start to end project velocity by 15%.
- Integrated Mapbox API with Jetpack Compose to implement a dynamic and interactive map, allowing access to 8 map styles, better customisability and rendering performance.
- Designed and prototyped 12 designs of user interface screens, coordinating application reviews with consumers to assess accessibility and ease of use of user interface elements.

Airbnb Analysis Jan 2023 - Apr 2023

Data Scientist

- Built an analytical model to identify profit maximisers on Airbnb with a classification accuracy of 91%.
- Conducted exploratory data analysis to remove outliers and null values to improve classification accuracy by 27%.
- Collaborated with 2 data scientists to perform Random Forest and Multi-variate K Means analysis to validate results generated.

AWARDS AND ACHIEVEMENTS

- The Rookies Excellence Award (2020 - 2020)
- Ubisoft Singapore Award for Outstanding Project Work (2020 - 2020)
- International Games Concept Challenge, 3rd Place (2019 - 2019)

SKILLS

Languages: C++, Python, Go, Rust, JavaScript, TypeScript
Libraries, Framework & Tools: Bash, React, Node.js, Redux, TailwindCSS, Git, CMake, Jenkins, Microsoft Azure, Docker

J’sen ONG

Phone: (+65) 9737 6482 | jsenongxuan@gmail.com | linkedin.com/in/jsen-ong/ | github.com/Jaysenso

EDUCATION

NANYANG TECHNOLOGICAL UNIVERSITY **Aug 2022 – Present**

Bachelor of Engineering in Computer Science

- **Relevant Courses :** Data Structures & Algorithms, Object Oriented Programming, Advanced Software Engineering, Data Science & Artificial Intelligence, Machine Learning, Neural Network & Deep Learning

NGEE ANN POLYTECHNIC **Apr 2017 – Apr 2020**

Diploma in Electrical Engineering with Merit

WORK EXPERIENCES

Home Team Science & Technology Agency (HTX) **Aug 2024 – Present**

Software Engineer *Singapore, Singapore*

- Developed a Retrieval-Augmented Generation (RAG) chatbot application that enables users to upload and process text and image files, generating contextually relevant responses with high accuracy.
- Designed and implemented a vector database using ChromaDB, optimizing document indexing and retrieval through embeddings for improved relevance.
- Built a conversation processing pipeline leveraging LLMs, enabling efficient summarization, key-point extraction, and jargon interpretation using dictionary-based term mapping.
- Developed a secure file storage system, integrating MongoDB for structured metadata management and optimizing CRUD operations for seamless file retrieval.
- Developed a modern full-stack web application using Next.js and React, featuring an intuitive, responsive UI with interactive file uploads, multi-file drag-and-drop support, real-time previews, and dynamic data tables, all enhanced with Tailwind CSS for a seamless user experience.
- Utilized AWS SageMaker for custom model hosting, and Hugging Face for model training, evaluation, and inference.

Hangzhou Himalaya Information Technology Co. Ltd **Aug 2019 – Jan 2020**

Engineering Intern *Hangzhou, Zhejiang*

- Leading manufacturer and solution provider for 3D printing Technology in Mainland China
- Collaborated closely with the engineering team, overseeing quality assurance testing and assembly processes to ensure strict adherence to company specifications
- Effectively communicated and collaborated with colleagues in a Chinese-speaking environment, leveraging my proficiency in Mandarin Chinese to facilitate seamless collaboration within the engineering team

TECHNICAL SKILLS

- **Programming/Markup Languages :** Java, Python, C, JavaScript, TypeScript, HTML, CSS
- **Technologies :** Next.js, React, Tailwind CSS, Git & GitHub, Firebase, MongoDB, ChromaDB, LangChain, HuggingFace, Ollama, Android Studio, Google Cloud Platform, Jupyter Notebook, Visual Studio Code, IntelliJ, Figma, DaVinci Resolve, Canva, Microsoft Office
- **Languages :** English (Native) and Mandarin Chinese (Fluent)

PROJECTS

MRT Shortest Path Visualization – Web Development | *TypeScript, Vite, React, Tailwind CSS*

- Developed an interactive visualisation using pathfinding algorithm to find the shortest path between MRT stations
- Implemented with TypeScript for robust type-checking and enhanced code quality
- Utilized React framework to construct dynamic UI/UX, ensuring an intuitive and seamless user experience
- Styled the application with Tailwind CSS for a customizable and responsive design
- Leveraged Vite as the build tool to facilitate hot module replacement for instantaneous feedback during development

Loolah – Mobile App Development | *Java, Android Studio, Google APIs, Firebase, Figma*

- Developed Loolah, a mobile application written in Java language, to help users to locate nearby toilets in Singapore
- Collaborated with a team of 5, utilized Firebase to efficiently store users’ data while integrating APIs from data.gov.sg (Platform Crowd Density & Carpark Availability) to offer real-time insights into crowd levels of selected toilets
- Designed and prototyped 11 designs of user interface screens in Figma, conducted usability testing and gathered insights from consumer reviews to assess the accessibility and ease of use of the UI elements
- Demonstrated proficiency in version control and collaborative development practices by creating and maintaining the Git Repository for the Loolah project, streamlining the development process

Hazim Khoiruddin Bin Mohd Sabirin | **Mobile No.: 91739948 | Email: hazimgunz@gmail.com**

EDUCATION

Nanyang Technological University, Singapore Aug 2022 - May 2026
Bachelor of Computing in Computer Science

Nanyang Polytechnic, Singapore Apr 2017 - Apr 2020
Diploma in Information Technology with Merit

WORK EXPERIENCE

Singapore Press Holdings Jun 2024- Dec 2024
WebApp Developer

- Led the migration and recoding of a legacy VB.NET web application to a modern .NET MVC framework, improving system performance, scalability, and maintainability.
- Collaborated with cross-functional teams to design, develop, and deploy robust engineering applications tailored to internal business needs.
- Ensured seamless integration of new application features and functionalities within existing infrastructure.

Monetary Authority of Singapore Sep 2019 - Feb 2020
Intern @ Data Analytics Department

- Created 7 Python scripts to streamline operational processes
- Improved data cleaning processes of excel files using newly created Python scripts by 90%
- Modified existing Python libraries such as openpyxl to suit requirements of scripts

TECHNICAL SKILLS

- Proficient: Python, Java, C#, SQL, Javascript, NodeJS
- Novice: .NET Core, ReactJS

LANGUAGES

Proficient in English and Malay

Raghav Rajendran NAIR | Mobile No.: 97247420 | Email: raghav004@e.ntu.edu.sg, raghavrnair@gmail.com

EDUCATION

Nanyang Technological University, Singapore Aug 2020 – May 2025
Bachelor of Engineering (Computer Science) and Bachelor of Social Sciences (Economics)

- Expected Honours
- NTU CleanTech Hackathon 2024 – Overall Champion
  - Case competition, Product Pitch, Sustainability
- DSTA BrainHack Hackathon 2021 – Ranked 11th out of 63 teams
  - Data Analytics, Computer Vision
- APECS Venture Capital Case Competition 2022 – Participant

WORK EXPERIENCE

Royal Vopak N.V, Sebarok Terminal, Singapore May 2024 – July 2024
Data Analytics & Operations Intern

- Built an internal tool on CLI that automates edits made to Sebarok terminal's work safety procedure documents, reducing time taken by 80%
- Built a live dashboard that tracks and analyses terminal's turnaround time for all vessels. Dashboard was made live in the central control room, and is currently being used by the Operations team
- As the project lead, regularly presented proposals to senior stakeholders in Netherlands and actively participated in weekly terminal management team meetings

Home Team Science & Technology Agency (HTX), Singapore Jan 2023 – June 2023
Software Engineer Intern – Computer Vision, Machine Learning, Data Mining

- Interned under HTX's Q Team Centre of Expertise, implementing innovative initiatives that enhance operational capabilities for the Singapore Police Force through rapid prototyping
- Completed two projects: Automated Number Plate Recognition and Integrated Web App development, that were presented to C-suite

School of Social Sciences, Nanyang Technological University, Singapore Aug 2022 – May 2023
Research Intern – Behavioural Economics & Data Analytics

- Assisted Professor Yohanes Eko Riyanto and Associate Professor Jonathan Tan in a project on Social Identity
- Project aims to analyse how cooperation between parties of different social identities vary in different social settings and how optimal social environments can be created from a public policy standpoint
- Built a game using oTree, a framework based on Python that is used to build Economics and Psychology experiments

ACADEMIC PROJECTS

Nanyang Technological University, Singapore Jan 2024 – Oct 2024
Generating synthetic ASR post-processing datasets for Singaporean English using LLMs

- Generated synthetic datasets using Mixtral LLM to finetune ASR post-processing models
- Built a pipeline that converts raw ASR output to fully punctuated and inverse text normalised synthetic datasets
- Improved model performance on slangs and hesitations common in Singapore English.
- Learned prompt engineering techniques and made use of libraries such as llama.cpp and LangChain

Nanyang Technological University, Singapore Jan 2022 – Apr 2022
Building a News Aggregator Android Application – Software Engineering

- Built a news aggregator app on Flutter, using Dart as the programming language
- The android mobile application displays articles from various new platforms on a single user interface. Application includes additional features such as saving news, picking favourite news categories and preferred geographical region

Kim Seo Jin

Mobile: +65 9820 7021 | **Email**: SEOJIN002@e.ntu.edu.sg | Singapore Permanent Residence

EDUCATION

Nanyang Technological University, Singapore **Aug 2021 – May 2025**

Bachelor of Computing (Honors), Computer Science

- Specialization - Data Science

SKILLS

- **Programming:** Python, MySQL, Java, HTML/CSS, JavaScript, MATLAB, Git
- **Tools:** Figma, Power BI, Power Automate, Microsoft Office Suite, Zoom, Agile
- **Soft skills**: Adaptability, Problem Solving, Leadership, Communication, Collaboration
- **Languages:** Korean (Native), English (Native), Chinese (Conversant)

INTERNSHIP EXPERIENCE

Corning Incorporated Singapore (Contract Manufacturing) **Jan 2024 – May 2024**

Data Analyst (Intern)

- Worked closely with supervisor to engineer forecasting models using **FBProphet** and **SARIMA** to forecast spending for CM partners. Drew insights to identify limitations in current data and areas of improvement.
- Automated 5,000 data for monthly pager creation through **Power BI** and **Power Automate** flow, significantly reducing manual effort and improving the timeliness and accuracy of communications.
- Enhanced supply chain cost optimization by applying **KMEAN** and **DBSCAN** for strategic clustering and nearest neighbor analyses, leading to more efficient transportation cost calculations over a period of 2 weeks.
- Accelerated price tier adjustments by reworking calculations from **Power BI** to **Python**, cutting processing time by 20-30% and reducing manual effort.

Shopee Singapore Pte. Ltd. (Regional Operations) ` **Oct 2023 – Dec 2023**

Data Analyst (Intern)

- Supported a team of 6 members to conduct in-depth analyses to identify key factors influencing Abandonment Rate (AR) and productivity.
- Utilized **SQL** proficiently to extract 10,000 – 20,000 records and manipulate from complex data warehouses, demonstrating a strong command of database management for enhanced efficiency.
- Developed and generated ad hoc reports tailored to support regional operational teams, providing actionable information for optimizing performance and resource allocation.

TECHNICAL PROJECTS

Machine Learning Project **Sep 2024 – Nov 2024**

- Pre-processed complex datasets with feature engineering, making valid assumptions and improving the model's ability to capture key patterns and relationships.
- Built **LightGBM** predictive models, optimizing performance via hyperparameter tuning and cross-validation.
- Developed a stacking-based ensemble model with a **neural network** meta-learner, achieving top 8% in Kaggle's ELO competition.

Data Science & Artificial Intelligence Project **Jan 2022 – Apr 2022**

- Analyzed data from data.gov.sg to identify factors driving HDB resale price increases using **Pandas**, **Seaborn**, **Matplotlib**, and **NumPy**.
- Deployed prediction ML models using **KNN Regressor**, **Random Forest** and **XGBoost**.

Object Oriented Design & Project **Aug 2022 – Nov 2022**

Title: Movie Booking and Listing Management Application

- Led a team of 5 to create a **Java** application that manages movie booking.
- Applied object-oriented concepts (**SOLID Principles**) to achieve error-free, low coupling and high cohesion goal within application and technical documentation.

LEONG Mininn Miko
I220009@e.ntu.edu.sg | LinkedIn | myPortfolio | Telegram | **Singaporean**

INTERNSHIP OBJECTIVE

- Applying for a **Summer Credit-Bearing Full-Time Internship**, **12 May 2025** - **18 July 2025** (**10 weeks**)
- Proficient in HTML, CSS, JS, Python, SQL, and PostgreSQL. Familiar with C, C#, Java, and PHP.
- Acquired experience in Software Engineering, AI, Data Analysis, Marketing, and Game Design.

EDUCATION

Nanyang Technological University, Singapore ***Aug 2022 – Jul 2026***
Bachelor of Computer Science - Computer Science
Bachelor of Business - Business *specialising in Business Analytics*

WORK AND INTERNSHIP EXPERIENCE

Decacorn Partners Pte. Ltd. (Part-time) ***Aug 2023 – Nov 2023***
Management Intern
- Researched 23 Companies to document their highlights for investment analysis reporting to my supervisor.
- Debugged and re-designed 20-30 features of 1 Squarespace website referencing its old Webflow website.

YouthHarmony (Volunteer)
Web Developer ***Mar 2022 – Jul 2024***
- Collaborated with 5-6 volunteers to develop, monitor, and maintain 1 organisation website incorporating Material-UI (MUI) and ReactJS libraries.
- Optimise 13 images used in that organisation's website to speed up loading time by 5 seconds.

Digital Marketer ***Aug 2023 – Jul 2024***
- Created and designed 2-3 digital content for 2 events using Canva and Inshot.
- Drafted 1 editorial calendar to schedule 3 posts weekly based on the highest traffic from research articles.

Data Analyst ***Aug 2023 – Jul 2024***
- Created 1 feedback form for every event to gather data, and observed insights to analysis.
- Offered feedback and recommendations to improve future events to gain more engagement and traffic.

PROJECT WORK

Nanyang Technological University, Singapore ***Aug 2023 – Jul 2024***
Undergraduate Research Experience on Campus (URECA):
Project - Design and Development of Immersive Game
- Collaborated with a group of 5 members to ideate and develop 1 video game with Unity.
- Coded and modified 6-7 functions for 3-4 game features in C#, created 4 soundtracks and 6 art assets.

Software Engineering ***Jan 2024 – May 2024***
Project - BikeBack
- Created a mobile application with React Native for bikers to ride while avoiding crowded routes.
- Stored 5 user data in MongoDB and the route data from the Google API.

Marketing ***Jan 2024 – Apr 2024***
Project - Shopping Cart with Seat for Elderly
- Applied marketing analysis framework and knowledge to effectively market products to the target audience.
- Proposed 1 proposal and 1 plan to address 1 problem statement based on the market research.

Analytics I: Visual & Predictive Techniques ***Aug 2023 – Dec 2023***
Project - Aramco Business Analysis
- Used R programming to load, manipulate, and analyse data. Analysed with ggplot2 library to generate charts.
- Used CART trees, logistic regression and linear regression in R to solve business problems.

Singapore Polytechnic, Singapore
Final Year Project ***Apr 2021 – Aug 2021***
Project - Smart Virtual Career Counsellor
- Developed 1 user interface using React.js, managed the backend in Django and a MongoDB database.
- Populated a myriad of job information from the top 10 entries from MongoDB based on user input.