

DEAKIN UNIVERSITY

CAPSTONE TEAM PROJECT (B)

ONTRACK SUBMISSION

Company Objectives and Structure

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March 26, 2023



Redback Operations - Company Structure and Objectives for 2023 T1

Executive Summary

Redback Operations intends to gamify exercise by producing cutting edge connected fitness devices to improve exercise quality and training effectiveness.

This trimester focuses are on improving the performance of the projects, by adding/developing more features. Such as implementing (FTP) to the Smart bike project in order to provide more personal workouts for users. VR team will be adding more features to game and also we will be working on improving the marketplace to provide additional incentive for exercising. We will continue improving visual consistency of the website, and securely deploying related services.

Planned features are:

- The cyber team aims to implement necessary security measures to protect critical systems
- The Dev/Ops team aim is to automate the code workflow by developing the CI/CD pipeline and gain in-depth understanding of various tools and technologies used in the process
- The IoT and Embedded Systems team will be working on implementing a system to measure functional threshold power (FTP) in order to provide more personal workouts for users.
- The mobile team will be focusing on app responsiveness and Implementing authentication and verification for the Login from both backend and frontend side
- VR team will continue implementing and developing the Sun Cycle project
- The remaining pages in the mobile application will be implemented
- The marketplace will be completed for the website so rewards from exercise can be redeemed
- Cyber Security will implement incident monitoring and firewalls to prevent compromise.
- The design team will improve the consistency and responsiveness of the website.

Signed off by the Acting Director.

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Leadership Team

Acting Director: Kevin lee

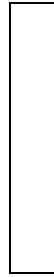
Company Lead: Ella Zarandi

Leadership Team:

Team	Leads
IOT	Ella Zarandi
VR	Hilal Irshad
Mobile	The Tung Truong
DevOps	Arjodh Singh
Data/AI	Mark Telley - Ella Zarandi
Web/Design	Brian Dang - Yiannis Doulgerakis
Cyber	Melvin Manoj

Teams

IOT	Data/AI	Mobile	DevOps
Ella Zarandi	Mark Telley	Tung Truong The	Arjodh Singh
William Djojodiredjo	Ella Zarandi	Seth Tan	Astifo Paul
Jarrold Yong	Prastut	Manusha Umayanga	Adhish Anand
Ethan Benjamin	Sindhuja Manduru	Raveen Yashod	Steve Lee Sam Titus Menacheery
Thomas Morgan	Tianqi Liang	Pengyu Xiao	Web/Design
Momin Khalid Butt	Saeed Alnaqeeb	Cyber	Brian Dang
Ahmad Riaz	Miriam Llauce Cotrina	Adam Bainey	EVAN MITROPOULOS
Vr	Tejas Varun Baskar	Carla Estella	NICOLAS ANDRES TOMAS
Hilal Irshad	Feature Lead	Caitlin Parker	Dio Kyrrou
Jarrold Yong	Prastut Sapkota	Stephen Tobechukwu	HARSH HIMMATBHAI PATEL
Steven Markris	Kunal Tripathi	Tahlea Grant	Robert Nicolas Bajan
Daniel Isla	Samuel Borough Kamau	Jikuan Liu	GERALD FERNANDO MINI FARFA
Jiahao Feng		Ash Fricker	HOKKY KURNIA GONDO KUSUMO
		Melvin Manoj	QIANHUI MENG MENG



	SANJAY MEDIKONDURU		JACK COUSENS
	Nasim Emadi		YESITHA HENAGAMA LIYANAGE
			ENOCK MOSIOMA NYAUNDI
			ANNO GOMES
			AKILA SOORIYABANDAR A
			NICHOLAS JAMES STAVROPOULOS
			YIANNIS DOULGERAKIS
			Han Xia

Trimester Goals and Objectives

Planned features are:

- The cyber team aims to implement necessary security measures to protect critical systems
- The Dev/Ops team aim is to automate the code workflow by developing the CI/CD pipeline and gain in-depth understanding of various tools and technologies used in the process
- The IoT and Embedded Systems team will be working on implementing a system to measure functional threshold power (FTP) in order to provide more personal workouts for users.
- The mobile team will be focusing on app responsiveness and Implementing authentication and verification for the Login from both backend and frontend side
- VR team will continue implementing and developing the Sun Cycle project

- The remaining pages in the mobile application will be implemented
- The marketplace will be completed for the website so rewards from exercise can be redeemed
- Cyber Security will implement incident monitoring and firewalls to prevent compromise.
- The design team will improve the consistency and responsiveness of the website.

Company Structure and Projects Overview

IOT:	Project 1: Smart Bike Project
VR:	Project 2: Sun Cycle Project
Mobile:	Project 3: Mobile Application
DevOps:	Project 4: Git App Repository Google Cloud Deployment
Web/Design	Project 5 : Mobile application Fixes and Additions
	Project 6 : Website Design Project
	Project 7: Web Development Frontend
Cyber:	Project 8: Implementation of a SIEM System
	Project 9: Project 10-Factor Authentication (2FA) Continuation
	Project 10- Implement Vulnerability Management Process
Data/AI:	Project 11: FIT File Handling and Data Pipeline
	Project 12: Corporate Reporting
	Project 13: The Cyclist/User Categorisation Project
	Project14: Sentiment analysis (language processing)
	Project 15: User Ranking - Engagement
	Project 16: Performance Ranking (User)
	Projects 17: Workout Categorisation
	Project 18: Data Warehouse
	Project 19: Google Analytics/Hotter Analytics/MixPanel/App Analytics
	Project 20: Posture Analysis

IoT and Embedded Systems

Overview, Goals, and Objectives

The IoT and Embedded Systems team will be predominantly working on the Smart Bike Project.

This trimester main focus of the IoT and Embedded Systems team will be to continue the development of the Smart Bike Project. As the majority of the Smart Bike's sensors and other hardware are already installed, the team will focus namely on:

- Implement system to measure functional threshold power (FTP)
- Improving the quality of data that is transmitted from the bike
- Fixing known bugs with the integration into other teams
- Fixing known hardware issues with the bike and its sensors
- Furthering the integration with the other projects of Redback Operations
- Finish Rigging the NPC model and manipulating its key points based on the pose
- Improvements to the end-to-end user experience
- Continue implementing the Cycling Against Friends/Ghosts feature in Project Sun Cycle

Project 1 : Smart Bike Project

Overview, Goals, and Objectives

The Smart Bike project developed an IoT enabled indoor exercise bike which takes the sensor data and delivers it to the cloud, where it can be used by the mobile application for exercise, or to deliver an immersive VR experience in Project Sun Cycle.

Given Redback Operations' focus on building "cutting edge technologies for connected health, fitness and sport to enable smart, safe exercise", the Smart Bike forms an integral part of the company's mission. As such, it is extremely important for the IoT team to continue with the development of the Smart Bike to allow the other teams to continue with their development and integration of it.

As the Smart Bike Project already has a working smart bike, one of the main focuses moving forward is to improve/add more features to Project Sun Cycle, as bellow:

- Implementing multiple circuits for Multiplayer/Cycling with Friends feature in the Project Sun Cycle Unity project
- Enabling more than two players to be able to race with each other in the Project Sun Cycle Unity project
- Implementing a lobby in the Project Sun Cycle Unity project in order to quickly choose who you might like to compete against
- Hooking up the summary screens (End of Workout interfaces) with accurate data from the smart bikes in the Project Sun Cycle Unity project
- Implementing Cross-play between the VR game and the mobile application

The IoT and Embedded Systems team will also be working on implementing a system to measure functional threshold power (FTP) in order to provide more personal workouts for users. This will result in users being able to get the most out of the smart bike by training to their maximum sustainable workload.

Deliverable: Heart rate stops publishing bug

Description: Heart rate seems to be published for a few seconds (and received by the subscribers), and after a few seconds it continues to report it is successfully published but nothing is received.

Team Members: Ella Zarani

Deliverable: KICKR won't start/ stops publishing bug

Team Members: Ella Zarani

Deliverable: Implement a FTP system

Description: To measure functional threshold power (FTP) in order to provide more personal workouts for users. This will result in users being able to get the most out of the smart bike by training to their maximum sustainable workload.

Team Members: Ella Zarani

Deliverable: Improvements to the end-to-end user experience

Description: Currently, a lot of hard coded information in Unity is used such as passwords, bike identifiers and player names. Ideally the GUI would set this information itself

Team Members: Jarrod Yong

Deliverable: Scripts to start processes on RPi

Description: Scripts were developed to start processes for the heart rate, kickr, fan and workout on the Raspberry Pi and can be found in the iot repository under scripts. These are best started manually once the bikes are ready to use.

Team Members: Jarrod Yong, Ethan Benjamin

Deliverable: Workout to process strength etc with more flexibility

Description: In order to target improving strength vs endurance, cyclists may wish to train at various percentages of their maximum sustainable output. Measuring VO2 Max is difficult but Functional Threshold Power is a possible surrogate.

If the mobile application were enhanced to enable the user to input their current FTP, workouts could be developed to train at various percentages of this maximum to target improving strength vs endurance vs anaerobic threshold.

Deliverable: Ethics submission for gas sensor system

Description: Submission for risk assessment of the details of the gas sampling system

Team Members: Ahmad Riaz, Momin Khalid Butt

Deliverable: Rate limit sending data from Pi (to avoid GCP fees)

Description: Once the startup scripts are written for the Raspberry pi's so they pair and publish data continuously there may be an issue that frequent uploading puts strain on GCP, particularly the fan topic which publishes at 10 Hz, and can cost upwards of \$20 per day in network costs when the CMS service is enabled. Throttling this rate to use QOS 2 and only publish changed values may be a way to avoid this.

Team Members: Ethan Benjamin, Thomas Morgan

Deliverable: Discussions with Google around obtaining Fitbit for use in this trimester.

Description: One method for obtaining VO2 Max without using the bikes is to use other datasets, such as integration with Fitbit which can estimate VO2 Max from running activity. They have an open api at developer.fitbit.com.

Team Members:

Deliverable: Continue implementing the Cycling Against Friends/Ghosts feature in Project Sun Cycle

Description: The Cycling Against Friends/Ghosts feature is a large feature consisting of many components. Further work can be implemented in the Project Sun Cycle Unity project.

Team Members and assigned tasks:

Task	Name	Level	Role
Implementing FTP system	ELLA ZARANDI	S	TL
	THOMAS MORGAN	J	TM
KICKR won't start/ stops publishing bug	ELLA ZARANDI	S	TM
	WILLIAM DJOJODIREDJO	J	TM
Limit rate-of-transmission from RPi (GCP cost)	ETHAN BENJAMIN	J	TM
	MOMIN KHALID BUTT	J	TM
Scripts to start processes on RPi	JARROD YONG	J	TM
	ETHAN BENJAMIN		TM
Heart rate publishing issue	THOMAS MORGAN	J	TM
	WILLIAM DJOJODIREDJO	J	TM
Improvements to end-to-end UX	JARROD YONG	J	TM
	AHMAD RIAZ	J	TM
	Haris Sajjad	J	TM
Continue implementing the Cycling Against Friends/Ghosts feature in Project Sun Cycle			

Project 2: Project Sun Cycle

A virtual reality game called Project Sun Cycle is played with an exercise cycle. The player can explore and travel around the post-apocalyptic tribal environment in this single-player experience, fulfilling quests like delivering supplies between the various tribes on their hover skater-bike. The goal of this project is to develop an enjoyable and engaging experience that will motivate people to exercise more by allowing them to play a video game at the same time.

Overview, Goals, and Objectives

By converting little virtual steps into bigger actual steps, Redback Operations aims to provide you with a smarter, fitter, and better environment. No of the weather, our organisation wants to put facilities in your hands. a lot of traffic? You won't need to worry, though, as our Smart Bike Project will dramatically revolutionise your indoor cycling experience and also provide you access to the outside world through a usable mobile app and an entertaining VR experience. In the workout VR game Project Sun Cycle, players use specially designed exercise bicycles to travel across the post-apocalyptic game world while delivering deliveries on a hover bike.

Aims for Trimester

In general, the goal of working on a VR project is to take advantage of the technology's unique characteristics to give users a more interesting, immersive, and useful experience. Continue the preceding project's incomplete portion's completion. Including additional components in the game. We'll release the manual documentation and UI design that how overall game will look like.

- Improve User Experience: Virtual reality (VR) offers a compelling, immersive experience that can greatly increase user engagement and project satisfaction. We will add more features where users can engage with the project more meaningfully by building a virtual environment.
- Visualizing Design: VR can assist architects, designers, and engineers in more realistically visualising their designs.
- Work on different tools like Trello and Figma design.
- Learn more about Unity.

Deliverables

1. Add different option for choosing bikes for the users.
2. To make more challenging environment we will add obstacles.
3. Add timer to the game in which user will reach or deliver within the given time.

4. Add bonus star through which player can increase their time while reaching to destination.
5. Create Speedometer to know how fast player is moving.
6. Creation of Game Design Document for the Cycling Against Friends/Ghosts feature to thoroughly document the specifics of the feature.
7. Finish off Figma designs for the Cycling Against Friends/Ghosts feature for the mobile application.
8. Create UML diagram.

Project Members

Name	Role	Tasks
Hilal Irshad	Leader	Timer and obstacles for the environment and implement Speedometer in the game.
Jarrod Yong	Member	Create UML diagram for the project and the SRS doc.
Steven Markris	Member	Create objects like bikes and add features to environment and implement that object inside virtual game
Daniel Isla	Member	Figma designs for the game interface and mobile UI.
Jiahao Feng	Member	Create Game Design Document and complete SRS doc.

Mobile Application Team

Team Trello: <https://trello.com/b/cNxiN0iZ/mobile-app-development>

Project 3: Mobile Application

Overview, Goals, and Objectives

The Mobile App is one of the Redbacks products that the user can engage with. It is about developing an app that will comprise one of the possible experiences Redback customers use when they are exercising. The problem it aims to solve is providing customers with an accessible and portable solution that can be used to track their fitness. A mobile app can easily be downloaded and set up on exercise machines or for workouts when the user is on the move. The overall goal of the project is to provide a friendly and engaging user experience that will impact stakeholders by building a brand image for Redback giving it value while also strengthening customer loyalty. The main deliverable for the project will be an app with all the necessary pages so that there is a complete experience from when the app is opened, and a workout is completed.

Aims for Trimester

- The main goal for this trimester is to finish the undone part from the last trimester:
 - o Continue to finish the pages from Figma (FAQ page and the Contact us page)
 - o Researching the way to make the app responsiveness to fit all screens
 - o Integrating the workout selection on the home screen
 - o Fixing the current bugs from the roadmap at the workout screen and login screen
 - o Adding the arena and the Marketplace features for the bottom Tabbar
 - o Adding comment for the function and file
 - o Save workout to MongoDB (need credential as the previous trimester students don't know what)
- Possible Implementation:
 - o Implementing authentication and verification for the Login from both backend and frontend side
 - o Implementing Marketplace features from the new Figma

Deliverables

- Focusing on finish the undone page from the Figma
- Improving app performance due to the app is not responsive to fit all screens
- Fixing the UI issues
- Improving backend performance

Project Members

Name	Level	Tasks	Role
Tung Truong The	Senior	Front-end Developer, improve app performance, finish UI on the FAQ screen	Team Leader
Seth Tan	Junior	Front-end Developer, fixing current bugs	Team Member
Manusha Umayanga	Junior	Back-end Developer, improve backend performance	Team Member
Raveen Yashod	Junior	Back-end Developer, fixing current bugs and improve the validation function from the backend side	Team Member
Pengyu Xiao	Senior	Front-end Developer, improve app performance, finish UI on the contact screen	Team Member

Dev/ops Team

Project4 : Git App Repository Google Cloud Deployment Overview, Goals, and Objectives

The main objective of this project was the deployment of the project contents from GitHub into the Google cloud platform. To define more clearly, the culmination of all works from the Redback Operations Team was created into a GitHub repository ready for access by all its team members and by the public. However, the plethora of code-files need to be uploaded as a web application in an online platform. For this process, we are using Google Cloud Platform as our deployment structure. Moreover, the code-files are created to accommodate for “containerization” of the applications. Some great advantages of this are cost cutting and easy test and deployment cycles. So, our project focusses on deployment of these docker applications into the Google Cloud Platform. Which prepares the “containerised” for access to the internet.

Aims for Trimester

- Our primary aim is to automate the code workflow by developing the CI/CD pipeline and gain in-depth understanding of various tools and technologies used in the process
- Secondly to create documentation that can act as step by step guide of creating CI/CD pipeline with Google cloud platform.
- Thirdly to provide handover documents highlighting about the deliverables accomplished and the deliverables that would move to next trimester

Deliverables

- Development of CI/CD pipeline in Google cloud
- Document highlighting step by step guide of creating CI/CD pipeline with Google cloud platform.
- Handover document that can act as reference for next trimester

Project Members

Name	Level	Task	Role
Arjodh Singh	Junior	Install GKE, CICD tools, cloud resource. Create the pipeline and Script. Research for creating Jenkins Job / Script.	Team Lead
Astifo Paul	Junior	Install & set up the Logging & Monitoring & Tracing tools.	Team Member

		Research for creating Jenkins Job / Script. Network & Security setting in GKE.	
Adhish Anand	Junior	Create the pipeline and Script. Network & Security setting in GKE. install & set up the Logging & Monitoring & Tracing tools.	Team Member
Steve Lee	Senior	Create the pipeline and Script. Connect Source repository with CICD tool. Install GKE, CICD tools, cloud resource.	Team Member
Sam Titus Menacheery	Senior	Create the pipeline and Script. Connect Source repository with CICD tool. Install GKE, CICD tools, cloud resource.	Team Member

※ Please be informed that the above tasks can be changed and added depending on the project.

Web Development and Design

RedBack Trello:

<https://trello.com/invite/b/4ueSjolZ/ATTI2748fd3a90d1e94d2cf01ec6a6fbd0de9FEDCCC0/design>

Team members trello:

<https://trello.com/invite/b/VaGG5QJV/ATTI5b3b328dfa977f2f700857c485a25d6544083928/design-team>

Overview, Goals, and Objectives

- The web development and design team is currently focused on enhancing Redback Operations exist designs and implementing UI designs to code
- We focused on analyzing the existing Figma projects and reconstructing the project to enhance the scalability and maintainability.
- As the designers and engineers work closely together, we make sure our designs not only visually appealing but also feasible to implement within the project time frame and guarantee the outcome of the project come out as expected

Project 5 - Mobile application Fixes and Additions

Overview, Goals, and Objectives

The current version of the mobile design developed by the previous team, however, after analyzed and discussed with the team, we have identified many problem with the current project such as all of the components in the design are not created as reusable components which make the project inconsistent very hard to maintain and scale for future improvement. Our final goal for this term is to redesign the blueprint project and improve its aesthetics by making it more aesthetically appealing and user-friendly.

Our team recognised the importance of the project's scalability and maintainability, as well as design consistency. All aspects had to be considered in order to achieve a successful execution with efficient future development possibilities. The consistency component inside the design should be maintained throughout every phase of its construction. Our commitment is to ensure that the outcome aligns with the goals of the whole project.

Aims for Trimester

Our key goal throughout this trimester is to finish the design and include new features before sending it to the other teams. For example, the front-end design team needed these designs to begin serious work on the actual product. Our goal is to complete the design to the highest potential standard, allowing other teams to use it efficiently.

Deliverables

Our Trimester Deliverables improve design , add new and reconstruct the project to enhance its scalability and maintainability.

The following things will be improve this trimester:

- + Marketplace design
- + Mobile App

Our long term objective for this project is to refine and finalize the design to a point where further work is only required for the addition of new features. Although the design is approaching this stage, some additional work is still necessary.

Project Members

- **Brian Dang** - Design Leader / UI Designer /UX researcher/ Developer
- **EVAN MITROPOULOS** - Design sub leader / UI Designer / UX researcher
- **NICOLAS ANDRES TOMAS** - Design sub leader/ UI Designer / UX researcher
- **DIO KYROU** - UI Designer /UX researcher
- **HARSH HIMMATBHAI PATEL** - UI Designer / UX researcher
- **ROBERT NICOLAS BAJAN** - UI Designer / UX researcher
- **GERALD FERNANDO MINI FARFAN** - UI Designer / UX researcher
- **HOKKY KURNIA GONDO KUSUMO** - UI Designer / UX researcher
- **QIANHUI MENG MENG** - UI Designer / UX researcher
- **JACK COUSENS** - Designer / UI Designer / UX researcher
- **YESITHA HENAGAMA LIYANAGE** - UI Designer/ Developer
- **ENOCK MOSIOMA NYAUNDI** - UI Designer / UX researcher
- **AKILA SOORIYABANDARA** - UI Designer / UX researcher
- **HAN XIA** - UI Designer / UX researcher

Project 6 - Website Design Project

Overview, Goals, and Objectives

Our primary goal for this effort is to make significant changes and improvements to the website's design. The focus would be on making it more visually appealing while also ensuring that its expandability and maintainability are improved.

The strategy currently lacks critical components and has inconsistencies that make it difficult to manage.

The goal is to overcome the barriers by focusing on the venture's reconstruction. Our goal statement includes creating an approach that will be robust and successful in the long run, resulting in positive outcomes for Redback's .

The other primary goal will be to implement the design changes in the frontend development of the website by coding all the new and improved web designs. This goal will also include making the website more functional with working buttons and other where it needs.

Looking at the previous year's report, the website needs to go live which is another goal we aim to achieve from the backend side of things.

Once again, as many in the team are not very experienced with little knowledge when it comes to frontend and backend web development, this is going to raise many barriers to overcome. But by finding the right strategy and time management and team effort, all of these barriers can be bypassed.

Aims for Trimester

The objective of the current project is to revamp the website design to align with the company's image and maintain consistency with other projects. We aim to prioritize this task as it is crucial to ensure that the design language resonates with the company's branding. Our end goal for this trimester is to achieve uniformity in design across all projects.

Deliverables

Our goal with this project is to create a design that will stand the test of time. This necessitates developing an appealing, changeable strategy that can be sustained for extended periods of time without necessitating extensive changes at future intervals. Finally, our primary goal is to build a structure that is unaffected by changes in its particular markets or technological breakthroughs.

During this trimester, our team has prioritized improving the design of our project and delegating completion duties to other groups. We recognise that success in this attempt will take more work than we have previously given; yet, we remain firm in our belief that dedicating ourselves to establishing an enduring and trustworthy design will result in significant benefits down the road. We are dedicated to designing designs that are not only visually appealing but also run at optimal efficiency while keeping to excellent quality standards.

Here is the list of frame will be improved this trimester:

- Daily report
- Community
- How to Participate
- Signup
- Login and Signup landing
- Yoga

- Workout
- Project
- Product
- Contact-us

Project Members

- **Brian Dang** - Design Leader / UI Designer /UX researcher/ Developer
- **EVAN MITROPOULOS** - Design sub leader / UI Designer / UX researcher
- **NICOLAS ANDRES TOMAS** - Design sub leader/ UI Designer / UX researcher
- **DIO KYROU** - UI Designer /UX researcher
- **HARSH HIMMATBHAI PATEL** - UI Designer / UX researcher
- **ROBERT NICOLAS BAJAN** - UI Designer / UX researcher
- **GERALD FERNANDO MINI FARFAN** - UI Designer / UX researcher
- **HOKKY KURNIA GONDO KUSUMO** - UI Designer / UX researcher
- **QIANHUI MENG MENG** - UI Designer / UX researcher
- **JACK COUSENS** - Designer / UI Designer / UX researcher
- **YESITHA HENAGAMA LIYANAGE** - UI Designer/ Developer
- **ENOCK MOSIOMA NYAUNDI** - UI Designer / UX researcher
- **AKILA SOORIYABANDARA** - UI Designer / UX researcher
- **HAN XIA** - UI Designer / UX researcher

Project 7: Web Development Frontend

Overview, Goals, and Objectives

Developing a web application allowing user to track their fitness data.

The goal of this project is implementing exist UI designs into reliable web application and getting the website live as well as making it more functional.

To implement designs changes where needed and improving the overall user friendliness and neatness of the website.

Objective is implementing the rest of the UI design frames from last trimester.

Aims for Trimester

The aim for this trimester is to complete the remaining frames left from the previous team which include Product Devices, Exercise History, Your Daily Report with Exercise, Exercises, and User Dashboard, Contact Us and if possible, get the website running live.

Deliverables

This trimester deliverable is:

- Product Devices
- Exercise History
- Your Daily report with exercise
- Exercises

- User Dashboard
- Contact-Us

Our long-term objective for this project is continuing implementing new features and pages provided by the design team and constantly improving web application responsiveness.

Project Members

- **Yiannis Doulgerakis** - Web Development Leader/ Developer
- **Brian Dang** - UI Designer /UX researcher/ Developer
- **NICHOLAS STAVROPOULOS** - Developer
- **ANNO GOMES** - Developer
- **YESITHA LIYANAGE** - UI Designer/ Developer

Cyber Team

Overview, Goals, and Objectives

The cyber team aims to implement necessary security measures to protect critical systems and all sorts of data involving RedBack activities from theft and damage. Establishing and maintaining user trust by developing a secure system is imperative for the company's long-term success. We are going to provision Security Incident & Event Management (SIEM) uses big data to receive firewall and security logs from cloud resources and does analysis to discover indications of compromise (IOC) and a platform that provides more visibility for incident tickets raised. The list below includes the key objectives of the cyber team in this trimester.

- Create/implement Security Incident and Event Monitoring system
- Create/implement firewalls
- Utilise both incident monitoring and firewalls in a manner which prevents data compromise for users and the company.
- Create/implement 2FA

Project 8: Implementation of a SIEM System

Overview, Goals, and Objectives

SIEM is fundamental and one of the essential 8 mandated cyber security requirements for companies in Australia. SIEM fundamentally consists of big data that stores logs and events which are analysed through playbook searches for correlations. Detection occurs with any indications that matches with a compromise which is then raised as a security incident to be actioned.

Upon completion of this project, IT resources provisioned on google cloud for Redback tenants, will be configured to feed their logs and events to SIEM.

Aims for Trimester

In this trimester the cyber security team would like to implement the following for the SIEM project.

- The basic functionality for SIEM system which will be provisioned in google cloud.
- A big data storage environment where the log stores will get set up.
- Define the feeders and log ingestions.
- Implement and deploy a few workflows, playbooks and dashboards.

Deliverables

- A SIEM with basic functionality implemented into our google cloud environment
- Processes and documentation around the SIEM system

Project Members

Member Name	Role	Task
Adam Bainey	Team Member	Incident monitoring (research and implementation/strategy to place in GCP environment)
Carla Estella	Team Member	Incident Monitoring (Research and Implementation)
Caitlin Parker	Team Leader	Incident Monitoring (research and implementation/strategy to place in GCP environment and create documentation for the system)
Stephen Tobechukwu Uzoka	Team Member	

Project 9-Factor Authentication (2FA) Continuation

Overview, Goals, and Objectives

The project aims to continue the previous trimester's 2-factor authentication implementation, with the motivation being secure and safe logins which ensure user authenticity and prevent malicious users gaining access to the company websites and databases. The overall goal is to work with previous works and ensure that a functional 2FA system is implemented at the website without any bugs or implications.

This positively impacts stakeholders as by implementing a 2FA system the attack space is reduced, and the likelihood of attack is minimised. Therefore, the cost of recovery to the company is diminished greatly, as well as the risk for negative publicity which may lead to distrust from clients.

Aims for Trimester

- Locate deliverables from Trimester 3
- Assess the implementation of 2 Factor Authentication as it stands
- Enhance the existing infrastructure so that we have a fully functioning 2 Factor Authentication service at login

Deliverables

- Full project documentation
- Demonstration of successful login with 2FA

Project Members

Member Name	Role	Task
Tahlea Grant	Team Member	Find deliverables from trimester 3 and assess
Jikuan Liu	Team Leader	Assess the implementation of 2 Factor Authentication as it stands.
ASH FRICKER	Team Member	Research and Test 2FA, find improvements and enhance the security.

Project 10- Implement Vulnerability Management Process

Overview, Goals, and Objectives

Vulnerability management is one of the essential 8 recommended by Australian government, and a key security control to track and monitor vulnerabilities of information technology assets. Vulnerability management system commonly, discover network connected devices and enumerates hard hardware, firmware/software of target devices and correlates with a database of known vulnerability/resolution to report vulnerabilities and track remediation assignments to service owner to resolve it (e.g. install a patch).

Aims for Trimester

- Firstly, IT assets need to be analysed to extract the required features for the solution (e.g. On-Prem assets, type of operating systems, etc.). this clarifies the project scope further.
- Doing vendor analysis and product selection to be reported to the company for product selection and financial contract.
- Setting up Initial basic functionality portal and first asset discovery.

Deliverables

The long-term deliverables for RedBack Operations would consists of:

- Project RFQ definition.
- Vendor and product analysis and selection
- Project tenant initiation.
- Onboarding Known devices (e.g Servers)
- Network Asset Discovery.
- Portal asset management, grouping assets and dashboard/report creations.
- Vulnerability management policy and procedures.

The trimester deliverables for Redback Operations would consists of:

- Project RFQ definition.
- Vendor and product analysis and selection
- Project tenant initiation.
- Network Asset Discovery.

Project Members

Member Name	Role	Task
Melvin Manoj	Team Member	Vendor and product analysis and selection
SANJAY MEDIKONDURU	Team Member	Project tenant initiation
Nasim Emadi	Team Lead	Network Asset Discovery

Data/AI team

Project 11: FIT File Handling and Data Pipeline

Overview, Goals, and Objectives

The FIT File Handling and Data Pipeline project aims to handle FIT files from the Wahoo KICKR Live, convert them to CSV format, and upload the data to a database. It will aim to provide real-time performance metrics through a rudimentary user interface using basic JS, HTML, and CSS as an MVP (only data points). The project will offer guidance to the web/application team on integrating the data within the game experience. A Python script will communicate with the KICKR, download, and convert FIT files to CSV, and integrate the data into the data warehouse project for storage. The project will provide a comprehensive solution for handling KICKR Live FIT files, making the data easily accessible for analysis and real-time performance metrics.

Top of Form

Aims for Trimester

- Develop a Python script for communicating with the Wahoo KICKR Live via Bluetooth connectivity and Wahoo API, downloading, and converting FIT files to CSV, and uploading data to a database.
- Create a rudimentary user interface using basic JS, HTML, and CSS to display real-time performance metrics as an MVP.
- Provide guidance to the web team on integrating the data within the game experience.

Deliverables

Long-term Deliverables:

- A comprehensive solution for handling KICKR Live FIT files, making the data easily accessible for analysis, and providing real-time performance metrics.
- A scalable and secure data pipeline that integrates with the game experience.

Trimester Deliverables

- Completed Python script for downloading, converting, and uploading FIT file data using the Wahoo API and Bluetooth connectivity to the KICKR Live.
- Rudimentary user interface displaying real-time performance metrics as an MVP.
- Documentation on Python script usage and deployment.
- Guidance for the web team on integrating data within the game experience, including instructions on how to access the data through the data pipeline.

Project Members

- Mark Telley – Product Owner
- Sindhuja – Product Lead
- Prastut – Stakeholder (Data warehouse)

Project 12: Corporate Reporting

Overview, Goals, and Objectives

The Corporate Reporting project aims to create static reports such as weekly summary reports, ranking analysis reports, workout summary reports and such using SQL query on the underlying tables. There will be Views created which will pull out the data required from the tables and produce the reports. This project will also aim at creating dynamic dashboards (Power BI or Tableau) that pulls data from database every time we need reports and generates the reports.

Top of Form

Aims for Trimester

- Develop Views which has underlying SQL queries that produce the data required like weekly summary reports, ranking analysis reports, workout summary reports.
- These views are automatically refreshed every time when new data is updated to tables and then the data can be saved to csv files.

Deliverables

Long-term Deliverables:

- An automated process to create and schedule stored procedure to run the SQL queries and generate reports.
- Prepare Dashboards (Power BI or Tableau) with filters on date and time so that these dashboards can be executed when required and published via browser or shared through emails or saved into excel, csv or pdf files.

Trimester Deliverables

- Completely developed Views which has underlying SQL queries that produce the data required like weekly summary reports, ranking analysis reports, workout summary reports.

Project Members

Sindhuja Manduru (Lead)

Ella Karimi Zarandi (Support)

Project 13: The Cyclist/User Categorisation Project

The Cyclist/User Categorisation Project aims to employ machine learning algorithms, including k-means clustering, hierarchical clustering, and principal component analysis (PCA), to comprehensively categorise cyclists based on their unique cycling behaviour patterns. The data used in this analysis will be collected from the Wahoo Kickr or Wahoo Bolt devices and Heart Rate monitor, analysed to develop a system of labels, spanning Pro, Semi-Pro, Amateur, Casual, Climber, and Sprinter cyclists. These labels will be further developed through data-driven analysis and may undergo changes, based on the outcomes. The insights gained from this categorisation will be vital in developing SunCycle and to compete with other competitors such apps such as Zwift or Strava, that matches cyclists with similarly skilled riders. Furthermore, the results of the analysis could be used for targeted marketing, sponsorships, and product development.

Aims for Trimester:

- Pre-process and clean the existing data set of FIT files.
- Perform exploratory data analysis on the data set to identify patterns and trends in cyclist behaviour.
- Apply unsupervised learning techniques such as k-means clustering, hierarchical clustering, and principal component analysis (PCA) to categorise cyclists based on their behaviour.
- Evaluate the effectiveness and accuracy of the categorisation results and refine the techniques as necessary.

Deliverables:

- Cleaned and pre-processed data set of FIT files – Create a specific dataset.
- Exploratory data analysis report outlining patterns and trends in cyclist behaviour.
- Categorisation report outlining the identified groups of cyclists based on their behaviour.
- Evaluation report detailing the effectiveness and accuracy of the categorisation results.
- Documentation outlining the project methodology, including data cleaning, and pre-processing steps, algorithm selection, and evaluation criteria.
- User guide and technical documentation for the updated library of algorithms and techniques.
- Handover documentation outlining the necessary steps for future maintenance and development of the project.

Project Members

- Mark Telley – Product Owner/Lead
- Ella Zarandi – Product Lead

Project 14: Sentiment analysis (language processing) and Community standards - User/Community comments

The objective of this feature is to create a welcoming and inclusive environment for SunCycle community. SunCycle users have the option to leave comments on each other's activities as means of increasing engagement. To ensure that the comments are appropriate and to keep track of language usage, this project will analyse comment data, develop a model, and classify user comments. Further work will focus on documenting community rules (policy) and how a model confirms with modern day AI ethics.

Aims for Trimester

- Document community guidelines.
- Research different models.
- Procure data sets for training purposes.
- Implement various machine learning model that can classify user comments.
- Analyse model performance and best fit.
- Documentation of entire process.
- Live demo application

Deliverables

- Community guidelines
- Python files with different models
- Documentation of working progress
- Live demo

Project Members

- Tianqi Liang (Yvette) – Lead; responsible for deliverables
- Ella Karimi Zarandi – Support

Project 15: User Ranking - Engagement

Overview, Goals, and Objectives

One of the main goals in our SunCycle community is to keep riders motivated and engaged in a regular base. We aim to develop a ranking system to achieve that purpose and enhance engagement among riders. The system is going to rank the users based on how many points they achieve, which will be calculated based on their engagement. We will collect their activity data, prepare it, and use it to build the system. To give an example, a rider could earn 'X' number of points if they ride in two consecutive days. Also, this project aims to use machine learning to provide the users with their ranking projected path, based on their previous engagement, which is expected to be a purpose for motivation.

Aims for Trimester

- Researching on ranking systems (Mostly related to sports)
- Establishing clear worked out calculations of how and when users earn points.
- Researching methods, technologies to be used, and implementing the algorithm (First implementation)
- Data collection and preparation for testing
- Documenting the whole process
- Researching possible machine learning implementations

Deliverables

Trimester 1 – 2023:

- Points ranking system based on users' activity data (Working prototype)
- Short report on the mechanism of the system
- A handover document for the next team

Long-term:

- Detailed analysis of users' engagement and rankings
- Machine learning features implementation (E.g., Projected path) based on previous research.

Project Members

Saeed Alnaqeeb – Lead; responsible for deliverables

Mark Telley – Support.

Project 16: Performance Ranking (User)

Based on training peaks [StackUp](#) – The following will be implement a feature that allows users to see their performance and how they rank or 'stack up'

Overview, Goals, and Objectives

The main goal of this project is to keep users engage with our product by giving them information regarding their performance. The performance analysis will be available in real time and users will have access to their historical performance. We will create dashboards where users can see their performance evolution. We will create different categories of performance and give them one final score. Users will be able to set goals for each performance category and track their progress on interactive dashboards this will create a competitive in-game environment.

Aims for Trimester

Describe the aims of the project for this trimester.

- Start the project documentation: Research and Setting objectives (deliverables).
- Develop a comprehensive understanding of performance KPIs in cycling.
- Gather and analyse the necessary data - making sure we have the data we need to create analysis and dashboards.
- Create user-friendly interactive dashboards of user performance analysis.
- Prepare documentation for handover to the next team.
-

Deliverables

Trimester 1 – 2023:

- Performance score calculation system based on users' activity data.
- User-friendly Interactive dashboards of user performance
- Real-time performance analysis and historical performance tracking.
- Tableau-based reporting for data visualisation.
- Documentation of the project's progress and findings for handover to the next team.

Long-term:

- Detailed analysis of users' engagement by tracking their own performance.
- Elaborate predictions of future goals based on their historical performance.

Project Members

Miriam Llaue Cotrina – Lead; responsible for deliverables

Tejas Varun Baskar – Support

Project 17: Workout Categorisation

Overview, Goals, and Objectives

The objective of this feature is to categorise workouts for Smart Bike users into workout types to tailor the experience to the requirements of each user and further gamify their training sessions. Whether a user is attempting to lose fat, improve cardiovascular fitness or simply increase endurance different workout types will provide different outcomes and we can highlight the benefits, recommend workouts that best suit their needs or identify if the user is not meeting their chosen goals. This project will analyse user outputs to develop a clustering model to label workouts based on similar features. Once these labels are assessed as appropriate, these labels can be used for further workout recommendations.

Aims for Trimester

- Identity appropriate datapoints for the dataset.
- Research different clustering models.
- Implement and assess different clustering models.
- Analyse model performance and validity of clusters.
- Develop a workout recommendation engine.
- Documentation of process steps.

Deliverables

- Clustering model – Trimester 1
- Recommendation engine – Trimester 1

Project Members

Feature lead – Nicholas Manning

Project 18: Data Warehouse

Overview, Goals and Objectives

The data for the Data and AI teams of Redback Company are temporarily stored in BigQuery environment. As BigQuery is a cloud-based environment and therefore has a limited database security option. As there is no infrastructure to manage and does not need a database administrator it can further expose the data to more vulnerabilities. So, we aim to provide an effective and long-term solution for the temporary measures that we have taken. The data will be pipelined into a Relational Database Management System (RDMS), and we aim to provide it through MSSQL. The data warehouse will consist of various layers from extracting Raw data to creating data marts for the business. In this project the primary focus would be providing an effective data warehouse architecture following data integration strategies, governance and security but not limited to modelling and analytics strategies.

Aims for Trimester

- Defining an architecture for the warehouse which includes data ingestion methods, storage options, and software and hardware specification, among others.
- Establishing data privacy, data security and data quality process.
- Development of logical models, data schemas and data marts.
- Establishing pipeline for the raw data connection and designing ETL pipelines.
- The ability of handling large chunks of data with continuous monitoring and optimizing.
- Development of master database.

Deliverables

Long-term

- A permanent solution to the extraction and storage of data.
- Integration of Extract, Transform and Load (ETL) workflows which extracts data from the source, transforms as per the architecture and requirements of the data warehouse, and loads into the warehouse.
- An effective data quality and governance framework.

Trimester

- A visual representation of the data structure in the data warehouse.
- A detailed description of how data from various sources are integrated and transformed.
- A master documentation that consists of comprehensive documentation of the data in the warehouse along with system and user documentation.
- A beta version of the integration of ETL through the proposed data warehouse architecture

Project Members

Prastut Sapkota – Project Lead

Project 19: Google Analytics/Hotter Analytics/MixPanel/App Analytics (Marketing and UX)

Overview, Goals, and Objectives

We are using existing data from Google Analytics to create reports to study user's behaviour and get meaningful insights about their out-of-game engagement to create a feedback loop for product owners which will enable them to view and address product statistics, bounce rates and various other issues.

Aims for Trimester

- To formalise report on key data insights
- Attempt to harmonise various data sources.
- To capture the behavioural & consumption pattern
- To collect details of other products of same specification

Deliverables

- Develop a pipeline for potential areas of focus for better allocation of resources.
- Develop functional model viz-a-viz product vs customers.
- Integrate with online data warehouse to store key data points such as the bounce rates and other critical user metrics, from various sources.
- Provide working example of software engagement metrics.

Project Members

Kunal Tripathi - Lead

Project 20: Posture Analysis

Overview, Goals, and Objectives

This project involves using pose estimation algorithms to detect postures and facial expressions and analyse them to better improve user experience during cycling. We can use gesture analysis to detect discomfort, exhaustion or enjoyment and provide the appropriate stimulation for the users or alerts. Moreover, we can also use posture analysis to recommend and monitor pre-workout warm-up stretches, cycling posture, and post workout cooldown stretches. The data can be used to improve the algorithm and provide insights for improving the environment or the bike.

Aims for Trimester

- Research of previous studies relating to facial gestures and posture during exercise
- Selecting the most suitable pose estimation algorithm as a base
- Collecting cycling and cycling related video and photo data
- Developing an analysis model that sorts and analyses the data, then creates a usable output for further use or storage
- Documenting the functionality of the model and its results

Deliverables

- Report on the information gathered from previous studies
- Cleaned and organised data
- A pose analysis model
- Documentation for project handover

Project Members

Samuel Borough Kamau-Lead