



SOFTWARE ENGINEERING PROJECT

COM2027

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# Final Audit Report: Eunoias

A Workplace Well-being and Intervention Application

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# Lessons Learned Report

## IMPORTANT - Last Minute Changes

Certain aspects of the document may not be entirely up to date with regards to the current state of the project. This is due to a last minute update by Clerk, which changed the parameters which the project required in the free plan. The parameters which were changed were the ability to create custom roles and custom permissions, which were moved to the first paid plan. As per the limitation disallowing the usage of paid plans, we were forced to make last minute accommodations to maintain functionality of the application.

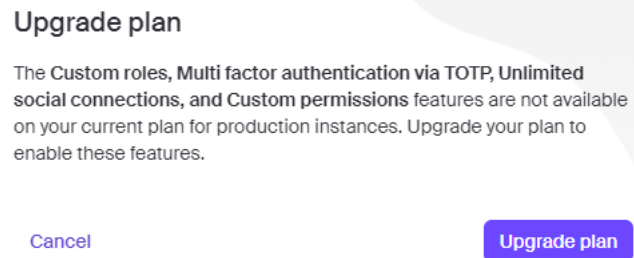


Figure 1: Clerk permissions change

To address this, we implemented metadata for all of the users who previously had a 'Counsellor' role. This would allow them to maintain their current level of permissions. Unfortunately, this would not be sustainable during real-life deployment of the application - but suffices for testing.



Figure 2: Clerk permissions solution

*If you are unable to login on the docker, use the developer mode using 'yarn dev'. For more info, please see the readme for how to initialise this. This was caused by a last minute update which we were unable to remedy for a timely submission.*

## Change Documentation

| Change Documentation Table |                                                                                   |                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                      |                                                                                                                                                                                                                                                             |
|----------------------------|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date                       | Change                                                                            | Justification                                                                                                                                                                                                                                                                                                                                    | Evidence                                                                                                                                                             | Procedure                                                                                                                                                                                                                                                   |
| 15/03                      | Amendment to scope - removal of absence reporting, community posts and video feed | The team decided within a group meeting that these proposed features were an over-extension of the project scope, and so should be removed in order to reduce time spent in development. It was also determined that corporations already employed technologies for announcements and absence reporting, and so it was unnecessary.              | There exists an abundance of corporate attendance and absence reporting platforms[9], and so it would clash with other technologies already in use by organisations. | A group meeting was held following a sponsor meeting. In this, we agreed unanimously that these features were an overreach of the scope and did not contribute to addressing the problem statement.                                                         |
| 20/03                      | Removal of Fitbit API from project proposal                                       | Following further research, we determined that Google Fit was better suited toward the needs of our web application. This is because of the availability of more data types, and was available on both Android and iOS - thereby eliminating the need for a second API to capture the same data.                                                 | Google Fit documentation states availability on all platforms[5]                                                                                                     | This was determined in a group meeting, and all present members agreed it was redundant to have two APIs serving the same purpose.                                                                                                                          |
| 01/04                      | Redesign and Repurpose of User Dashboard                                          | During a design meeting among members of the team, we decided that the current plan for the user interface was too bare-bones, and hindered accessibility. We decided that the dashboard should serve instead as a central hub containing all relevant information, instead of being a glorified navigation page. Accordingly, we redesigned it. | See Appendix Figure 33 for original designs, and design section for final design sketch.                                                                             | The group proposed alternative sketches during a group meeting, and we agreed unanimously on an alternative.                                                                                                                                                |
| 01/04                      | Re-imagining of Colour Scheme                                                     | The team decided that the colour scheme was too bland - there was not enough variety of colours, which gave a 'depressing' feel to the website. Accordingly, we chose to update the colour scheme.                                                                                                                                               | See Appendix Figure 33 and 34 for comparison.                                                                                                                        | During a group meeting, we each proposed different colour schemes and voted on the one we felt fit the best.                                                                                                                                                |
| 20/04                      | Removal of Microsoft Graphing API from implementation plan                        | When we were about to begin development, we realised that although the usage of the Microsoft Graphing API was free, you needed application approval which would not be able to be obtained within a realistic time-frame and would hold up development. This was a failure of the group's planning stage.                                       | See Microsoft API documentation [11]                                                                                                                                 | Discovered during implementation, team held an emergency meeting and discussed alternatives. The team understood that it was a failure during the design and planning stage, and reviewed the plans to ensure that no other failures such as this occurred. |

## Lessons Learned

### Personal Evaluations

- Alex:
  - Over the course of development, I broadened my knowledge of various technologies and frameworks. For example, I learned about the usage of various database technologies as well as introduced myself to working with the Next.js framework for the first time. Further to this, I believe I have greatly enhanced my proficiency with regards to academic writing. Thanks to this, the documentation is generally of a high quality and outlined clearly the entire development process of the application. My contributions to the project involve significant involvement in the planning and design phases, as well as contribution to the backend development. To improve in the future, I should get involved more in the physical development of the application.
- John:
  - Reflecting on the project, my contributions in documentation was the area where I felt both comfortable and successful. I documented the Minutes documents throughout the Sponsor Meetings, made major progress in the reports (such as PDD and the Final Aduit report), and conducted research that benefited development. At the start of the project, my communication skills were somewhat poor. Nevertheless I have made major strides in team communication efficiency over the period of this project. I found coding difficult especially when using new technologies like Next.js and TypeScript where I lacked coding experience in. I also struggled with the understanding of the component structure, but ultimately, I expanded my technical expertise throughout development. Also, I have broadened my understanding of using Tailwind the most, and I plan to incorporate it into my personal projects. In future group projects, I will aim to contribute a lot more in the implementation side of development.
- Naim:
  - Through the duration of the project, I am pleased with how I managed to perform our testing tasks according to plan and put in place some robust error handling mechanisms which improved the application's stability and user friendliness while serving as a test lead. Learning Next.js, Jest testing framework and improving team communication were some of my most difficult aspects. However, after those initial difficulties I not only became good at these new technologies but also improve my communication on working together more effectively. This experience has also given more confidence in my ability to work on intricate projects as well as refined my technical abilities. I look back at these experiences and they teach me some valuable lessons for future projects. Firstly, it is important that the initial stages of the project be characterised by all-inclusive tests and constant communication among team members in order to sustain energy and adaptability, thus guaranteeing lasting success.
- Aran:
  - During development I was able to enhance my skills in web development, I discovered new libraries and explored new elements of Next.js I had not used prior to this project. I had the opportunity to learn framer motion as well as advance my skills in TypeScript. Furthermore the inclusion of TailwindCSS allowed me to be able to create advanced and flexible UI that leads to an improved user experience. Working closely with the application side of the team I also was able to gain invaluable experience working in a collaborative environment. In the future I believe the project can benefit from a mailer in order to have better contact with the end users as well as, with the current state of the project this should be reasonably easy to implement thanks to the way we integrated the database as well as modularly designed the features of the application.
- Ismaeel:

- Through out the duration of this project I learned a high level of TypeScript, expanding my knowledge of both client and server components within Next.js having faced many issues along the way which i have been able to over come. I also learned how to use Framer Motion in order to assist with the Front end aspects of our application, further more learning additional libraries along the way for both back end and a bit of front end. The project has allowed me to gain invaluable experience in web development.
- Karl:
  - Throughout the development of the project, I found programming to be quite challenging, especially when it came to using Next.js' formatting and component structure. Despite these difficulties, I managed to learn several new concepts, such as server-side rendering and the integration of TailwindCSS for efficient styling. On the other hand, I am very pleased with the vast research and content I provided to the team. My efforts in researching workplace well-being practices and mental health resources significantly enriched the application's functionality. The comprehensive content I developed, including detailed questionnaires and informative articles, greatly contributed to the overall value of the project. I am proud of the positive impact my research and content contributions have had on the project, enhancing its relevance and usefulness for both employees and employers. In the future, I aim to improve my programming skills by dedicating more time to practicing and understanding the intricacies of frameworks like Next.js. Additionally, I plan to engage in more code reviews and seek feedback from my peers to refine my coding techniques and better adhere to best practices. By focusing on these areas, I hope to enhance my proficiency and contribute more effectively to future projects.

## Team Evaluation and Project Management

For the majority of the project time-frame, overall team cohesion was poor and a substantial chunk of the workload was performed at the tail-end of the project schedule. This can be pinned down to two primary causes:

- Lack of engagement from team members
  - For the first 8 weeks, there was a very limited amount of engagement from the majority of team members - with only AJ and IA performing consistent work regarding development. This caused a significant slowdown of progress and missed project deadlines. In future, team members need to be proactive - they should attempt to communicate with the team and must complete their assigned tasks on time. Reasons given involved prioritisation of other courseworks and ambiguity regarding assigned tasks.
- Project Management
  - Project Management should have been more pro-active - in future, communication standards and meeting schedules should have been more set and stone and enforced by the project manager similarly in style to the final weeks of the project.

Toward the end of the project, beginning week 10, all remaining members significantly picked up the pace and regular meetings on a daily basis began to be held as per recommendation from our project sponsor. This drive significantly improved group engagement and ensured that the project could be delivered on a timely basis.

While the team largely stuck to their designated roles during the project lifecycle, it became clear that some members struggled to fully meet the expectations of their general development responsibilities. Moving forward, leveraging a more collaborative dynamic would serve to greatly improve the efficiency of the team throughout the development process.

The team also faced disagreements with regards to the team scaling, which had to be mediated through the project sponsor. Eventually, these concerns were discussed and a resolution was reached with regards to the scaling. If we were to redo the project, it would be prudent to establish a more formal system of grading individual involvement using the grading scale.

## Technical

Our web application integrates a multitude of complex technical frameworks and technologies, which are combined to give the application a professional standard. Each component, such as the database, authentication system or application components are seamlessly integrated to deliver a cohesive user experience. Our approach to the technical development of the project adheres to best practices and ensures robustness, scalability and maintainability across the application. Through leveraging our chosen technologies, we created a powerful platform that was able to meet the needs of our users as per the problem statement.

An improvement in future for the technical development of the application is to encourage all team members to take on a larger role in development. A majority of the technical developmental responsibility fell on two team members, which caused a significantly unbalanced workload, resulting in delay of features until the last minute which caused strain to the critical path of the project. By having the full team working on the project, we could have completed the technical section in a much more timely fashion and to a higher standard, as there would not be as much of a rush in the final weeks.

## Documentation Quality

The meticulous quality of the design documentation allowed the implementation process to be streamlined. This provided a greater degree of clarity and efficiency during the development of each component. Through the outline of architectural blueprints, interface specifications, use cases and flow charts, our design documentation provided a very comprehensive roadmap for the implementation team to follow. This level of detail enabled swift decision making, eliminating ambiguity and allowed for a greater degree of collaboration in the final stages of development. As well as this, the thoroughness of the documentation empowered the team to identify challenges at an early stage.

# Final Audit Report

## 1 Definition and Planning

### 1.1 Introduction

Organizations are increasingly recognising that fostering a culture of well-being not only enhances employee satisfaction and retention, but directly correlates to heightened individual productivity and therefore overall business success[6]. As such, we were tasked with developing tools and strategies to assess as well as improve employee well-being as per our **problem statement** [12]. Our objective was therefore to develop a web application which would assist employers in cultivating a workplace environment that prioritizes the physical, mental, and emotional health of employees, aligning with the UN Sustainable Development Goal 3.

### 1.2 Market Research

Existing applications which cater towards workplace well-being primarily revolve around encouraging office employees to commit to physical activity, as per multiple studies which correlate daily amounts of physical exercise with a decrease in levels of depression[3]. Examples of these include GoJoe and YuMuuv, which involve both team-building and individual physical activity challenges. Those that do not exclusively focus on physical activity, such as Wellable, provide generalised on-demand health content. We therefore identified a gap in the market - no other web application combined both physical activity and self-report assessments to deliver a personalised profile of individual employees.

### 1.3 Evolution of Proposal

Our initial proposal was based around a self-report scheme which consisted of a daily 3-5 minute questionnaire. We devised this based off a set of key factors which were proven to lead to workplace dissatisfaction

decreased well-being, such as workload, working relationships with managers and room for progression[13]. These would provide both qualitative and quantitative feedback to employers. Over time, it would develop a profile for each user based off the information obtained through the questionnaires. Separately, the web application would also feature a step tracker feature and would maintain a history of days where the user was able to hit a predetermined target.

We also initially planned on including a system for absence reporting, community feed and organisation announcements. However, all of these were later abandoned at the tail end of the proposal phase as being determined by the group as being an over-extension of the scope. We determined that organisations would already have provisions for absence reporting and announcements, and so it would be an un-necessary addition. As for the community feed, the team decided it was a dereliction of the original project scope and did not play in to addressing the problem statement.

Following meetings with the group and our project sponsor, we identified several key issues with the initial idea:

- A five minute interruption is a substantial amount for a the average employee - a personal example given by our Project Sponsor was that people are often in back-to-back meetings and so there is very little time within the working day where it would be appropriate. As well as this, research shows that many employees are already severely overworked [7]. Therefore, adding more of a burden would have the opposite of the intended effect.
- There existed no incentive for users to maintain engagement with the application, beyond employers mandating users to take part. As pointed out by our project sponsor, this would give a 'big-brother' feeling to users which would not be conducive to supporting employees' mental well-being within the workplace.
- There was no integration between the different features. Each metric, such as self-report score and challenges completed, had no interaction with any other metric besides being displayed for the user.
- Privacy concerns were established with regards to the user information. We included no provision for allowing users to opt-out from participating in company wide metrics.

To address the above issues, our team devised the corresponding amendments to our initial project proposal:

- The size of the questionnaire would be reduced to just a few questions per day - all of which would be either multiple choice, or very small qualitative inputs. This would work to minimise any potential disruption to the working day.
- Instead of a mandate by employers to interact with the application, the team decided on a combination of two methods to encourage users to participate - gamification and notification.
  - Gamification: As users interacted with the application, they would develop a 'streak' - essentially, a statistic displayed to the user which shows how many days in a row they have completed their check-in. This has been shown on many platforms to entice continued participation[10]. Further to this, continued engagement would result in a boost to the user rating. This will be elaborated on in detail later.
  - Notification: At a random point during the working day, users would be pinged on either Microsoft Teams or by email, dependent on what the user has chosen to be notified through, to complete the check-in. **This would meet our real-time processing constraint.**
- We decided that to better integrate all of the features, each individual component should contribute towards a common goal for a user. From this, we created the idea of a 'user rating' score. This score would be calculated on a per-user basis and would depend on the self-report answers within the check-ins, the amount of physical activity challenges completed and the user's engagement with the

platform. **As per our constraint to include batch-processing**, information could be collected en-masse from all employees of a company and relayed to the employer to provide metrics regarding the current mood of temas.

- The application enables users to choose whether or not they would like to provide their anonymised information to be used as feedback to the employer or if they would like to retain their information for personal use only. This would give users the choice on how their data is used, ensuring compliance with any data protection regulations. This will function on an opt-out basis.

From this, our proposal now had the capacity to effectively capture information from employees, as per our **problem statement** to assess well-being within the workplace. Employers would then receive this information as feedback on how they can make improvements. This would therefore indirectly meet the criteria for 'improving' well-being as well. This, however, was not clear enough. We decided upon the creation of the *intervention system* for the handling of more acute or imminent issues. Employees would have the capacity to raise issues with a designated person, or persons, within the company. The designated person would then be able to assign actions to the issue in order for it to be resolved. Functionally, this would be similar to a ticketing system. We decided to separate this from administrators as part of our social and ethical considerations, as the intervention tickets may contain information that employees would not wish their managers to see.

Lastly, every company has different policies, resources and points of contact when it comes to employee health. For this reason, we included a company resources hub which would be customisable by company administrators on the website. This would allow them to display all relevant information regarding mental and physical health.

From here, we were satisfied our project proposal met all of the criteria within the problem statement and that the web application would serve as an effective tool upon completion.

## 1.4 Summary of Final Proposal

Our final proposal, which was submitted within the Eunoias Project Definition Document, is a web application which makes use of a daily check-in system to collect information regarding the user's experience with their current job. The information would develop the user's profile, viewable on the User Dashboard. If the user has not opted out of providing data to organisation metrics, the answers provided will also contribute to the organisation breakdown viewable on the administrator dashboard. Users will also have access to fitness challenges, displayed on the user dashboard. As well as this, completing check-ins for several days in a row will accrue a 'streak'. Each user will have a 'user rating' - a metric which is a compound of engagement, self-report answers and completion of fitness challenges.

For more pressing issues, the intervention system will allow users to raise 'tickets' with organisation counsellors, and to self-assign a priority. Alternatively, organisation counsellors can raise them and assign users. As well as this, there will exist a company resources page which would be fully customisable by the organisational administrators.

## 1.5 Personal Development Targets

Over the course of the planning and preparation phase, the team decided upon the usage of frameworks and technologies that were unfamiliar to us. The reason for this was two-fold - firstly, the chosen technologies were far more effective at accomplishing the goals of the project proposal than those we were already familiar with. Secondly, it gave all members of the team opportunities for the development of proficiency with highly in-demand skills, such as Next.js. This would make us better equipped to handle the challenges we faced throughout the project. Each task undertaken demanded a degree of independent learning to ensure successful completion, fostering a culture of continuous improvement within the team. Through this process, we aimed not only to deliver a high-quality web application but also to invest in our professional growth as software developers.

## 1.6 Legal, Ethical and Social Responsibility

As a company that takes care of the mental and physical wellbeing of employees, we have a huge legal, ethical, and social responsibility due to the sensitive data we collect. It was important for us to consider who were going to view the website and ensure the website is designed to accommodate for all these people.

For social responsibilities, we needed to promote wellness and generate a corporate culture of employee health, where users feel that data is used for their benefit and assistance, and not discipline and profit. As a result, we decided advertising will not be used and display NHS articles for this purpose. It is also our responsibility to provide workers with informed consent to which what data will be collected and how it will be used. This would be provided by some of the APIs and our privacy policy page. We also planned for a way that allows our users to easily communicate with us, which is why we planned to have an intervention system that would be accessible to everyone.

Ethics are concerned with our values as a community and how these will impact different groups of people. We planned to obtain only necessary data that relates to the wellness of users and refrain from using it for other reasons. In addition to this, it is our responsibility to classify data as much as possible and we planned to only have certain qualified individuals to access personal data. This is done by using role-based access control in our database. As a result, users can feel secure using our services. We are also ethically responsible that there would be no bias towards any group of users, and that everyone would get assessed equally. Furthermore, we planned to implement design attributes that would accommodate people with disabilities such as visual impairment, so everyone can use our services.

With legal responsibilities, since the application will be managing sensitive data regarding employees' well being, we must get consent to collect and use it according to the law, for instance, General Data Protection Regulations (GDPR) and the 2008 Data Protection act. According to the 2008 Data Protection Act, data should be used fairly, lawfully and transparently and for its rightful purposes (to monitor users' well-being). The type of data and the way we handle data would be written in the privacy policy page of our website, as we want to appear as transparent to the users as possible.

## 1.7 Amendments to Scope

During the course of development, it became evident that the project scope remained largely unchanged. The initial objectives and deliverables outlined at the project's beginning continued to serve as the core tasks for development efforts. However, some adjustments and additions were made to the scope to accommodate evolving requirements and emerging opportunities for improvement.

One amendment to the scope which occurred during the implementation was the narrowing of the scope of the fitness challenges. This is because of the difficulty of the implementation and a delay to the schedule. Instead of having a broad range of fitness challenges, we limited it to activities regarding either distance or step count, as these were simple metrics to track.

## 1.8 Evolution of Roles

Throughout the development cycle, the roles of the project remained largely unchanged from the initial meeting. We decided upon this approach as we agreed that it was best to maintain a degree of consistency throughout the course of the project. The roles were not a strict definition of an individual's contribution to the project, being more of a guide as to what they would generally work on. All members of the team were responsible as well for general development, meaning that where necessary work on areas outside their designation could be completed. One role that changed during the course of the project was that of the Project Manager, so as to give individuals that desired experience with managing the direction of a software development project the opportunity to do so.

## 1.9 Evolution of Schedule

The initial Project Schedule was created by dividing the time-frame from the approval of the Project Proposal to the deadline date in to weekly blocks and assigning different components of the web application to be completed by the end of the respective time-block. Some features, according to estimated complexity, were given more than one block to represent the actual likely time to complete. The advantage to this block system was that not all features would take a whole week to develop. This meant that there existed room for manoeuvre should one of the components over-run, or an unexpected absence from development occurred. Within the schedule, each task was assigned dependencies in order to maintain a clear critical path which would be convenient for the team to follow, as well as containing information about which members of the team were assigned to its completion. A 'Difficulty' section was also added, with the goal of balancing the average difficulty of components across various members of the team, so as to not overwhelm certain members of the group. All team members were in approval of the schedule.

This schedule held up well in practice, as the flexibility of the block system allowed us to respond to an unanticipated slowdown during the Easter holiday break, where not as much progress was completed on the main dashboard as expected. As there was leeway within the other blocks, the remaining tasks were simply added to the next block along due to be completed.

## 2 Design

### 2.1 Design Process and Goals

Each application feature underwent a thorough design and planning phase prior to its implementation. Over the course of this phase, a set of general criteria were laid out against the proposed feature. This ensured that an exhaustive outline of every aspect of the application was in place before any development began. Through this, the team aimed to both minimise the risk of unexpected complications related to the implementation and ensure maximum team efficiency throughout the development phase. By undertaking this methodical approach, we sought to preemptively address any hurdles that may impede the progress of the project, thus safeguarding against any delay to the critical path.

The criteria chosen were carefully selected so as to encompass various dimensions of the application's functionality, usability, scalability, compliance with data protection regulations as well as the meeting of existing project constraints. Through this process, we aimed to establish a robust framework that would guide the team towards the successful implementation of the project goals.

- Meeting of Constraints[4]
  - For this section, we evaluated whether or not the overall project constraints[4], such as the requirement of batch processing, real-time processing and API usage, were already being met by existing features. If they were not, we assessed if the feature in question could be implemented in such a way as to address the constraint without deviation from the original purpose of the feature.
- Integration with Other Features
  - When evaluating features that interacted with other parts of the application, the team delved in to how they could seamlessly fit together. This involved consideration as to how each feature could complement existing components in such a way as to prevent clashes or duplication. We aimed for an approach that would streamline the application's functionality.
- Usage of Technologies and Frameworks
  - Prior to the start of the design of the model, the team gave consideration to potential technologies or frameworks available that could facilitate the implementation process. This involved

research and analysis to identify the most suitable tools for the task at hand. The team sought, through this, to leverage solutions that would expedite development that would align with our project's objectives. This proactive approach ensured that the proper tools were identified from the outset. We also looked at the cost of using technologies, and the potential costs should volume of users increase substantially.

- Compliance with Data Protection Regulations and Ethical Responsibilities
  - We assessed, for each feature, which relevant pieces of user information were used, how they would be stored, who would be able to access it and whether or not consent to the usage of the information should be obtained before its implementation to comply with both legal and ethical standards. This comprehensive approach ensured that our data practices were not only compliant with regulatory frameworks such as GDPR, but also aligned with our ethical responsibilities to safeguard user privacy and autonomy. Through prioritizing transparency, we aimed to foster a relationship of trust with our end-user. This is essential, given that the application revolves around mental well-being, and therefore the user must feel safe while engaging with it.

### 2.1.1 Modelling Process

After scrutinizing each feature according to the outlined criteria, the subsequent phase of the design process revolved around the creation of the conceptual designs for the back-end elements. This involved translating the identified requirements in to tangible blueprints for the creation of data models for use during the implementation process. This would allow expedited creation of database models later on.

### 2.1.2 Goals

Following this methodical design process involving several predefined criteria meets several goals:

- Risk Mitigation
  - By evaluating each feature against predefined criteria, the group aimed to identify potential risks and challenges early on in the stages of development. This reduces the likelihood of unexpected complications during implementation.
- Ensuring Alignment with Objectives
  - The use of the predefined criteria ensures that every feature aligns with the objectives of the project. By establishing clear guidelines for evaluation, coherence is maintained universally throughout the design process.
- Optimizing Resource Allocation
  - Through assessing the feasibility and efficiency of approaches to implementation, the method allows for more efficient allocation of resources during development.
- Facilitating Communication and Collaboration
  - The use of predefined criteria provides a common framework for communication and collaboration during the design phase of the application. It allows for several features to be designed simultaneously, which is necessary for our usage of the Agile methodology, as they follow a coherent design structure.
- Legal and Ethical Compliance
  - By considering factors such as data protection regulations and ethical responsibilities, the method ensures compliance with legal requirements and ethical standards.

## 2.2 User Interface

The physical design of elements on the website was aimed to be customer-focused and to accommodate all groups of people, to comply with the WCAG 2.1 and the UK 2010 Equality Act. Therefore, through these adapted design features our application is made for an easy browsing experience for everyone, even people that are not technologically adept. Examples of some of the design features that are made to assist people with visual impairment are:

- Efficient separation and padding between elements in the dashboard
- Enlarged functionalities in the dashboard, such as the Step count and NHS articles for an easy reading experience.
- Visual indicators that show users where they are going, so when a user is hovering over an element such as a button, it expands and changes colour.
- When the user is navigating, they can't be trapped in a certain page with no way to go forth or backwards to another page, as the header with different links to pages would always be present.
- Website has high contrast between the text and the background, making text more apparent.

### 2.2.1 Colour Paradigms

In selecting our colour scheme, we carefully considered how different colours are interpreted and any potential negative associations they may have. Our goal was to both to promote functionality and ensure inclusivity, particularly for users with visual impairments or colour blindness. After careful consideration, we opted for a colour scheme comprised of various shades of blue. This is because of studies that show blue as both a highly popular colour, and one associated with calmness, relaxation, and stability[2].

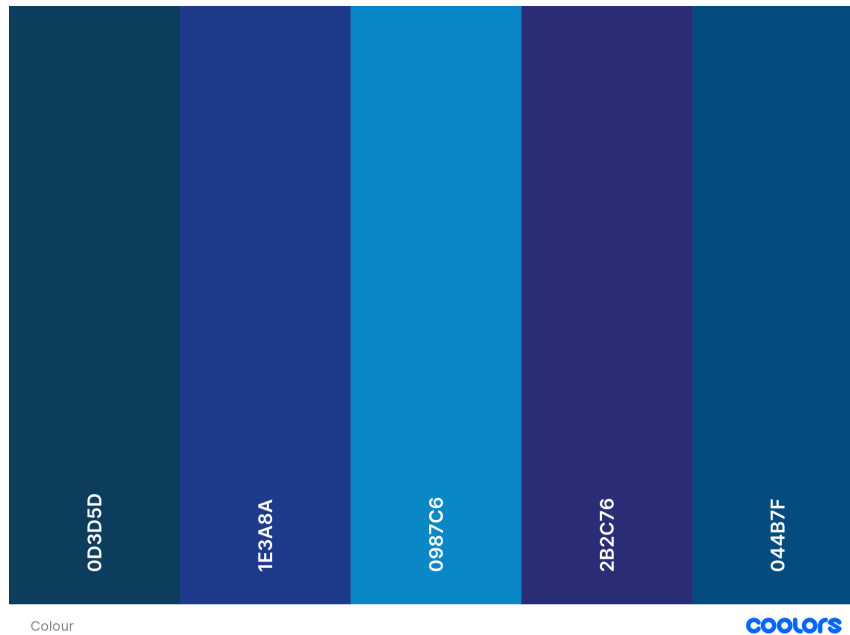


Figure 3: Proposed Colour Scheme

As well as this, we included a provision to swap between light and dark modes while using the application. This acknowledges that user preference for interface appearance can vary widely and changes based

on environmental factors, such as the current lighting of the working environment. As modern workforces are constantly working from different areas, with as many as 25% working in hybrid roles[8], providing this flexibility is important to empower users to customise their viewing experience according to their immediate needs and preference.

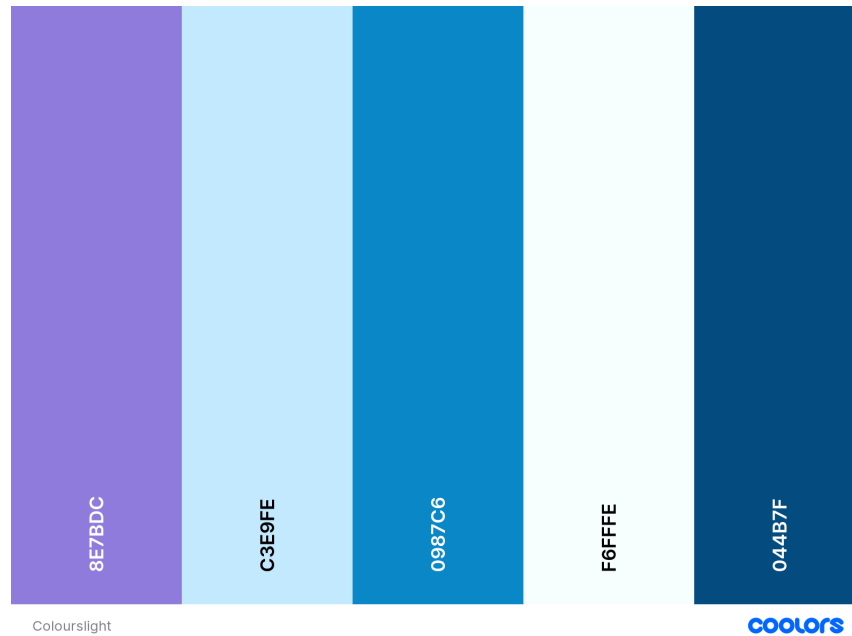


Figure 4: Proposed Colour Scheme

### 2.2.2 User Dashboard

The User Dashboard will serve as the primary interface for users of the web application, providing a comprehensive overview of relevant features and functionalities. With this intuitive and user-friendly interface, users will find a breakdown of information and tools to support their well-being. The information displayed on the dashboard will be:

- Information about the user account
- Information about any active physical challenges
- Information regarding engagement
  - This section will offer insights into user engagement with the application, including metrics such completion of check-ins, activity levels, and participation in challenges.
- Information regarding current step count
  - Users will have real-time access to their daily step count, allowing them to monitor their physical activity levels and set personal goals for daily steps or overall activity.
- Relevant NHS Mental Health articles
  - This section will curate a selection of relevant articles and resources from the NHS Mental Health API. Users can access educational content, coping strategies and support resources.

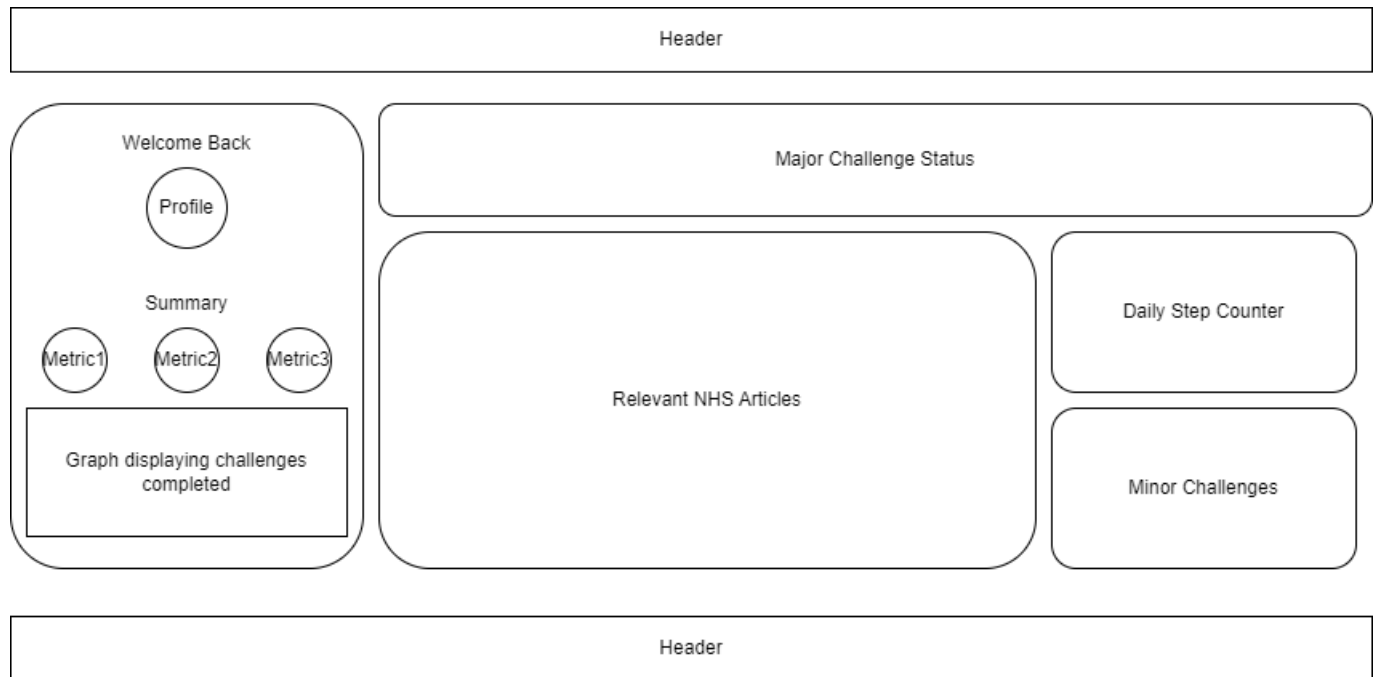


Figure 5: Proposed Dashboard Interface

**Home Page** The homepage serves as a welcoming introduction to our application. It will provide users with a glimpse into its features and functionalities. Here, it will feature key metrics that offer a snapshot of the services our site has to offer. By presenting this information up front, the homepage aims to engage users and encourage them to explore further in to the application. Additionally, the homepage will feature brief introductory content.

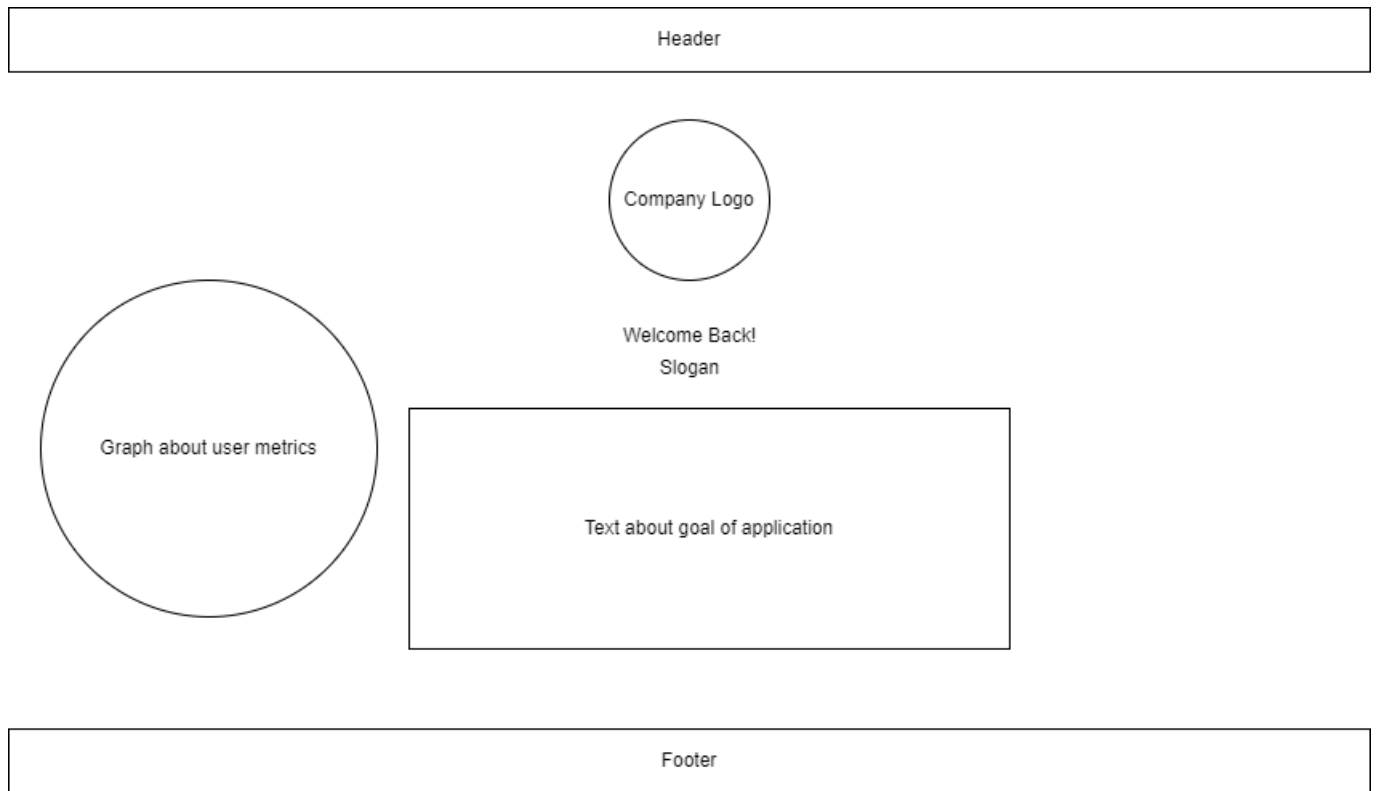


Figure 6: Proposed Homepage Interface

### 2.2.3 Administrator Dashboard

The Administrator dashboard serves as a tool for organisation administrators, offering a comprehensive overview of their company's performance and user engagement within the application. The interface is intuitive and provides access to batch-processed metrics which offer insights into the various aspects of user interaction and well-being. Among the key metrics displayed are the average user rating, and the average levels of engagement and participation in challenges. As well as this, the dashboard includes dynamic leaderboards that show user achievement - allowing workplaces to reward individuals who participate most within the website. Overall, it serves as a 'strategic command centre' for organisation administrators, providing them with actionable insights, metrics and comparative analytics to effectively manage and optimize their organisation's engagement with the application.

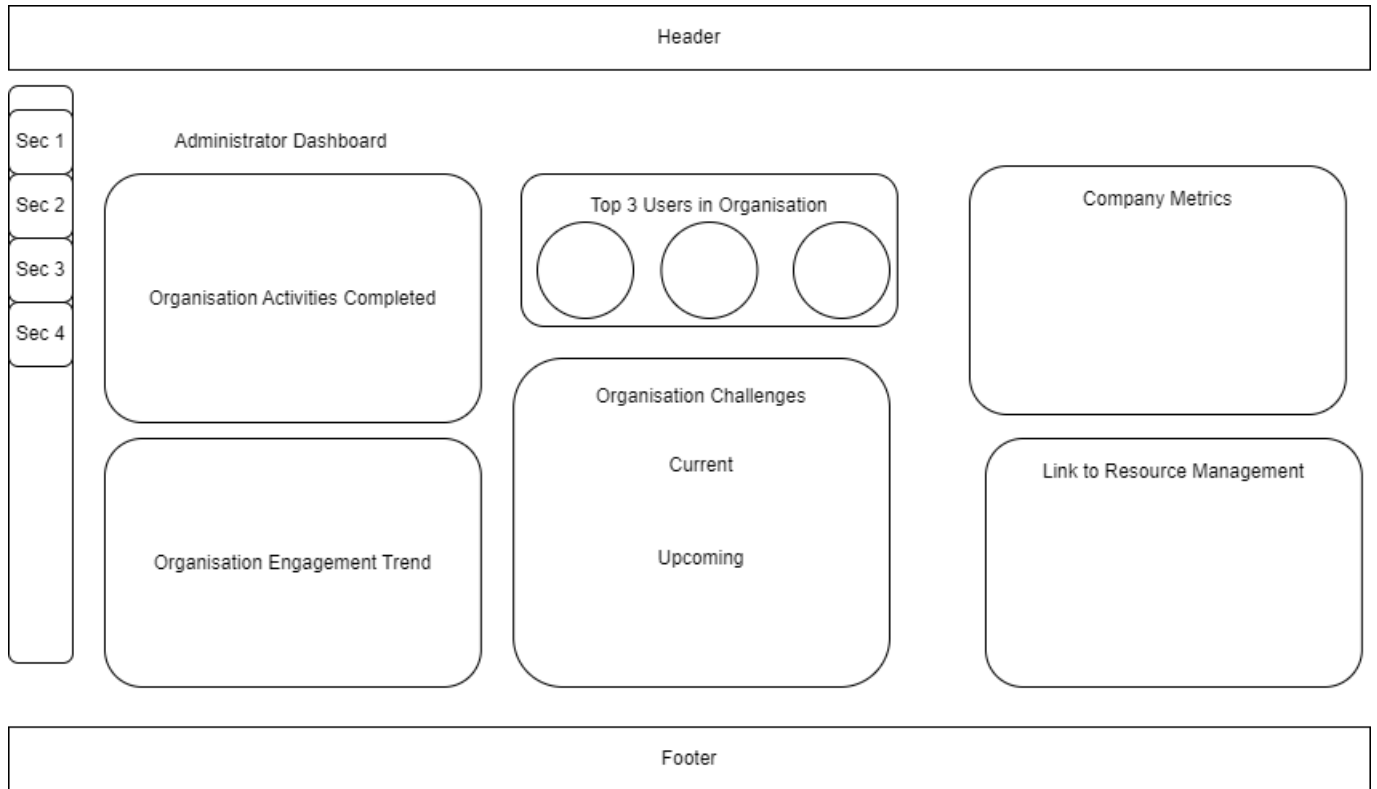


Figure 7: Proposed Admin Interface

The Administrator dashboard will also feature a sidebar, which will contain options redirecting to deeper views into statistics, such as a full leaderboard.

#### 2.2.4 Header and Footer

The header and footer serve as critical components for navigation throughout the web application. In designing them, we strive to offer the users both functionality and visual appeal. At the top left of our header, our logo is placed. This establishes a strong visual hierarchy and reinforces our brand identity, setting the tone for the user experience[1].

Within the header, users find navigation options which include a search bar for exploration of the site's content. Additionally, buttons for important links such as the homepage and dashboard are present to provide direct access. Users also have easy access to both their own and their organisational profile.

The header and footer must be designed in such a way as to strike a fine balance between aesthetics and functionality. We will do this by employing clean and modern styling to enhance visual appeal while prioritising clarity.

Within the footer, users will find other, non-critical navigation options, such as a link to our privacy policy and directions to support documentation. This ensures that users have access to important information and assistance throughout their experience.

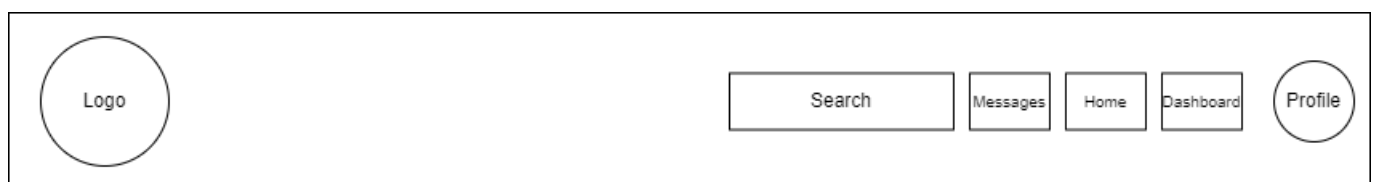


Figure 8: Proposed Header

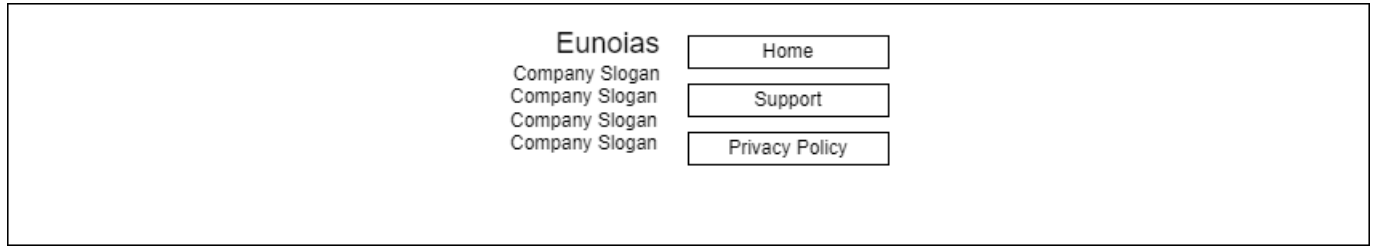


Figure 9: Proposed Footer

## 2.3 Functional Requirements

As per the project definition document, the web application had the following functional requirements:

### 2.3.1 User Authentication

#### Criteria Evaluation:

- Usage of Technologies and Frameworks
  - We have opted to integrate the Clerk authentication framework in to our application due to its compatibility with an array of frameworks and technologies we employ, including Supabase and next.js. Clerk's straightforward integration progress simplifies development tasks, allowing us to focus on delivering a seamless user experience without being burdened by compatibility issues. Furthermore, Clerk offers a range of convenient features, such as the capability to create and manage users within organisational structures. This functionality aligns with our requirements, allowing us to efficiently handle user management tasks.
- Compliance with Data Protection Regulations and Ethical Responsibilities
  - A factor that influenced our decision to utilise Clerk was our responsibility for user safety and data privacy. Clerk boasts robust security architecture, ensuring the utmost user data protection. Its implementation of secure authentication protocols, such as OAuth 2.0 and OpenID connect, ensure that only authorised users would be able to access secured resources. By leveraging this, we felt we could better fulfil our legal responsibility to protect user data.

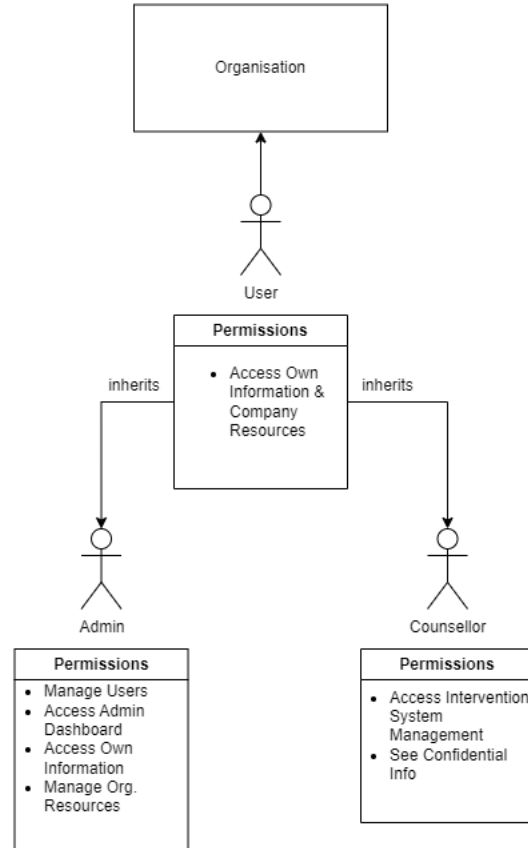


Figure 10: Permissions Diagram

Each user will belong to an Organisation. Each Organisation will have three tiers of permissions - firstly, Administrator. Administrator permissions allow the user to manage the roles of other users, access the administrator dashboard which shows general company metrics (e.g. average user rating), and manage the organisation resources page. Counsellor permissions allow the user to access the intervention system, manage active tickets, and view related confidential information (provided that consent from the user is obtained). The User permission simply allows access to the application.

### 2.3.2 Daily Check-In System

The Daily Check-In System is a core component that serves as an essential part of the functionality of the project. Once per day, during a random time interval, users will be prompted through a notification to complete a daily questionnaire of no more than 30 seconds in length. The information captured from the questionnaire will then develop the user profile and be sent to the Administrator Dashboard for organisation metrics.

#### Criteria Evaluation:

- Meeting of Constraints:
  - The daily check-in system can be designed in such a way as to allow for the coverage of several key project constraints. Firstly, the requirement for real-time processing[4] can be met through the random notification of users during the working day to notify them to complete their questionnaire. Secondly, the information captured through the questionnaires can be used to complete batch processing[4]. Finally, this feature also is a key component in the completion of the criteria set out within the problem statement.

- Integration with Other Features
  - As a key component of the web application, many other features either interact or draw information from the check-in system. As such, the information obtained must be consistent and this feature should be prioritised in development in order to allow for the streamlined implementation of other features.
- Usage of Technologies and Frameworks
  - In order to notify users on Microsoft Teams, usage of the Microsoft Graphs API is required. This will be free given a small amount of API calls, though a **large volume** of calls will require paying for an upgraded plan.
- Compliance with Data Protection Regulations and Ethical Responsibilities
  - As the information captured through the daily questionnaires is personal information, consent must be obtained for its collection upon sign-up to the application. Further to this, it is ethically responsible to require further consent for the anonymised information to be sent to contribute to organisation metrics, and to have the option to toggle this later on in such a way that it is convenient for the user to access.

## Design Description

Upon opening the questionnaire, users will be presented with a panel containing a question, e.g. 'How manageable is your current workload?' and a set of 5 options, numbered 1 to 5, with a corresponding answer, e.g. '1 - Completely unmanageable' to '5 - Easily manageable'. We opted for this approach, instead of a slider or another simple for two reasons. Firstly, it forces the user to choose from a pre-determined set of options which would allow for the quantitative data to be easier to process. Secondly, users may empathise more with statements rather than a plain slider and so the feedback pertaining to well-being within the workplace would be more accurate.

Upon completion of the question, users will hit the 'Next Question' button and be directed to the next question. There will be 3 questions per check-in. Once the user completes the third, they are then able to submit their data. At any point before this, the user is able to return and change their answer. Once submitted, the data is then stored within the application database and associated with the user. If the user has not opted out of participating in organisation metrics, the data will be used during batch processing for use in the administrator dashboard.

## Entity Relationship Diagram

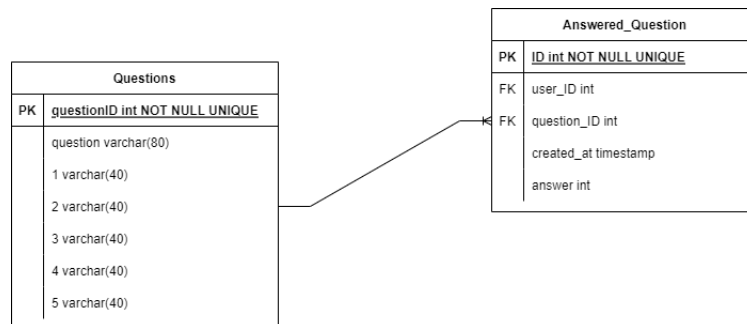


Figure 11: ERD for Daily Check-In

The Questions table will contain the title of the question and the options will be stored corresponding to their answer level (with 1 being a negative answer, and 5 being positive). Both will be stored as varchars. To record the questions answered by users, there will be a table called AnsweredQuestions

with foreign keys linking the user's ID and the ID of the question. It will store the timestamp when the question was answered, and the answer given.

### Display Sketch

The design sketch shows a mobile application interface for a 'Daily Check-In'. It consists of a central modal window with a blurred background. The modal has a header bar with a progress indicator '1/3' on the left, the title 'QUESTION DESCRIPTION' in the center, and a close button 'X' on the right. Below the header, there is a list of five options: 'Option 1', 'Option 2', 'Option 3', 'Option 4', and 'Option 5'. At the bottom of the modal is a 'Submit' button. The entire modal is centered on a page with a 'Header' bar at the top and a 'Footer' bar at the bottom. The background of the page is labeled 'BLURRED BACKGROUND' on both the left and right sides.

Figure 12: Design for Daily Check-In

### Flow Chart:

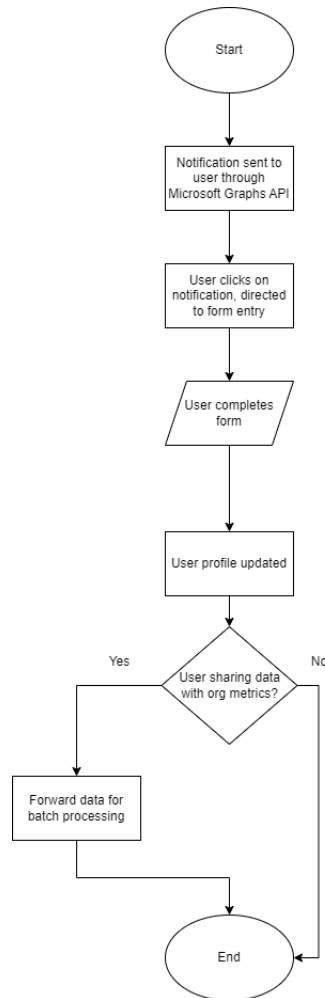


Figure 13: Flow Chart for Daily Check-In

### 2.3.3 Weekly/Daily Challenge System

The challenge system serves as a central feature of the application, motivating users to prioritize physical activity for enhancing their mental well-being. User engagement will be facilitated through participation in challenges, which will be monitored using the Google Fit API. These challenges may involve tasks such as completing vigorous workouts or achieving specific step goals over a weekly timeframe. The

#### Criteria Evaluation:

- Meeting of Constraints:
  - As part of collecting the physical activity data of users, use of the Google Fit API is required. This satisfies part of the requirement for the usage of data from at least two external APIs within the functionality of the application.
- Integration with Other Features
  - This feature is integrated with several other components within the application. Information regarding the progress on the challenges will be required for the user dashboards, as well as data regarding the challenges completed to contribute to the user rating score.

- Usage of Technologies and Frameworks
  - We have chosen to utilise the Google Fit API for this section because of its free availability. Alternatives, such as the Fitbit API, require official approval in order to access data - which would be unlikely, given the current scale of the project. The sole disadvantage of using Google Fit is that certain pieces of data are restricted to developers with authorisation.
- Compliance with Data Protection Regulations and Ethical Responsibilities
  - As data regarding an individual's exercise is private, we have a responsibility as developers to ensure that this information is kept private. We also have a responsibility, as per GDPR, to ensure that data is not collected unnecessarily and that any information recorded is removed when no longer necessary.

A user's progress on the current active challenge will be updated upon visiting the website. This is a self-imposed restraint, as due to our usage of the free version of the API as per the project constraints<sup>[4]</sup> we are limited to a set amount of API calls within a 24 hour time-frame. When progress is updated, the application will check if the conditions of the challenge are satisfied, and mark it as complete if so.

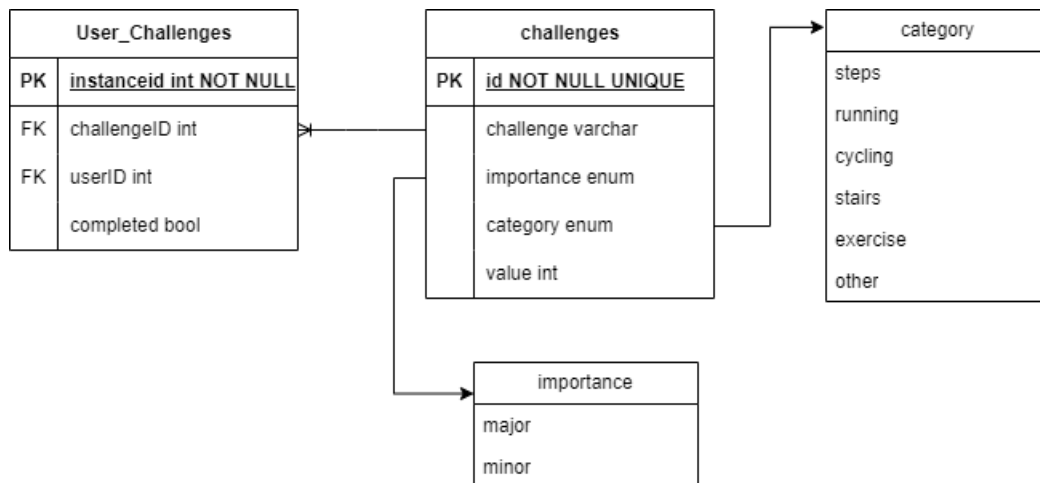


Figure 14: ERD for Challenge System

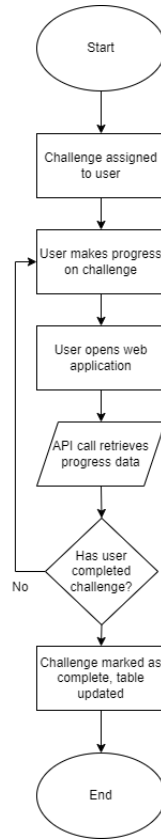


Figure 15: Flow Chart for Challenge System

### 2.3.4 User Rating System

The User Rating system serves as a key component of a web application, encompassing a wide evaluation of a user's engagement, self-report performance and completion of challenges. This approach ensures a broad reflection of each user's participation with the platform. Beyond serving as an indicator of individual progress, the User Rating system serves as a benchmark for both the user and their organisation. Organisation can track their average user rating over time, allowing them to probe the general morale of the workplace, and users can see their rating over time to track their progress.

- Meeting of Constraints:
  - The User Rating System can assist in meeting the requirement for server-side batch processing through contributing to the organisation-wide statistics.
- Integration with Other Features
  - The User Rating system is tightly integrated across all aspects of the web application. Therefore, the value must be kept as a consistent type (float) and have full coverage through unit testing.
- Compliance with Data Protection Regulations and Ethical Responsibilities
  - As our score is a measure of a user's current mental well being, it is our ethical responsibility to ensure that the information is not shared to any individuals or organisations that the user does not consent to. Therefore, we should provide an ability for users to opt out of sharing information to organisation statistics.

The user rating is calculated based off weighted scores from various components of the website. The score is then displayed both on the user dashboard and will determine the user's place on the organisation leaderboard.

$$UserRating = (0.4 * interactions) + (0.3 * majorChallenge) + (0.2 * streak) + (0.1 * minorChallenge)$$

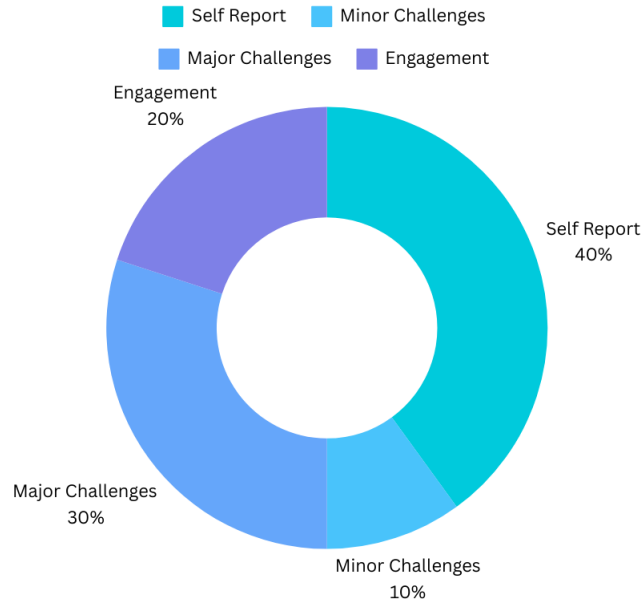


Figure 16: Flow Chart for Challenge System

### 2.3.5 Intervention System

The Intervention System serves as a fundamental component within the application, allowing users to submit tickets which are then addressed by their designated organisation counsellors. Users are granted the flexibility to set the priority level for their requests, up to a certain level. As well as this, they can select a preferred counsellor, if available. For counsellors, the system offers visibility in to their upcoming intervention cases, enabling them to manage their workload, schedule appointments and access metric overviews. This approach ensures timely support and tailored assistance for users through empowering support staff with the tools necessary to deliver effective interventions. This meets our criteria for 'assess and assist' employee well-being within the workplace.

- Meeting of Constraints:
  - This feature is an essential part of meeting out the criteria set out in the problem statement to 'assess and improve' employee well-being. This provides functionality to the website to give users the opportunity to address more immediate issues. It meets the criteria set out by facilitating intervention by designated counsellors, ensuring that employees receive the necessary assistance promptly.
- Compliance with Data Protection Regulations and Ethical Responsibilities
  - As the intervention requests on the platform will contain sensitive information, it is of utmost importance that any data captured is kept limited to designated counsellors within a user's organisation and the original sending user. This is in line with the mandates set out by GDPR - which outlines that personal data must be kept secure and protected against unauthorised

access, alteration, disclosure or destruction. As well as this, we must ensure that none of the captured data is used beyond the scope of the intervention system.

Users will have access to two sections within the intervention system. One is for interventions pre-arranged by counsellors, for which users will have a reference code sent to their email in order to access the system. For creating a new intervention, users will have the ability to select a priority and a preferred counsellor.

The mockup shows a web page layout. At the top is a horizontal rectangle labeled 'Header'. Below it is a section titled 'Interventions'. This section contains two rounded rectangular boxes. The top box is titled 'Existing/pre booked interventions' and contains a square icon labeled 'Icon' on the left and a rounded button labeled 'Continue' on the right. The bottom box is titled 'Create New Intervention' and also contains a square icon labeled 'Icon' on the left and a rounded button labeled 'Continue' on the right. At the bottom of the page is a horizontal rectangle labeled 'Footer'.

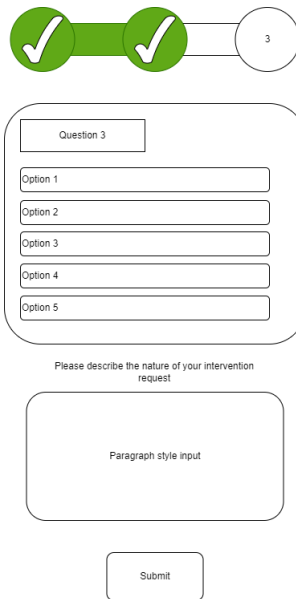
Figure 17: Mockup of Intervention page prior to interaction

Once a user interacts with one of the options, the prompts to select details appear.

The mockup shows the same web page layout as Figure 17, but with interactive elements. The 'Existing/pre booked interventions' box now has a text input field labeled 'Enter Reference #' and a button labeled 'Next' instead of a 'Continue' button. The 'Create New Intervention' box now has two stacked text input fields labeled 'Select Counsellor' and 'Select Severity', and a button labeled 'Next' instead of a 'Continue' button. The 'Header' and 'Footer' sections remain unchanged.

Figure 18: Mockup of Intervention page post interaction

Following the selection of details, the user will be prompted to complete a short questionnaire assessing their current mental state. After this, they will be invited to outline the reason for the intervention request in a paragraph-style text box.



Progress indicator: 3 steps, with the first two marked as complete (green checkmarks) and the third as the current step (number 3).

Question 3

Option 1

Option 2

Option 3

Option 4

Option 5

Please describe the nature of your intervention request

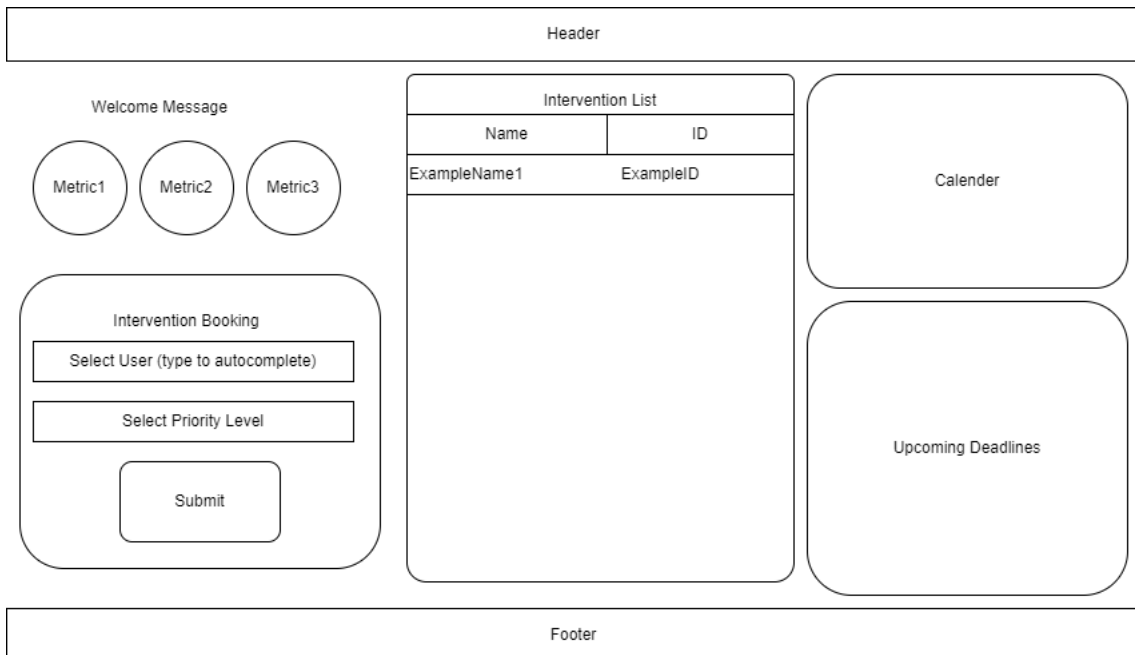
Paragraph style input

Submit

Figure 19: Mockup of Intervention questionnaire

Once the user submits the questionnaire, it will be forwarded to an organisation counsellor or designated person. Each organisation counsellor has access to a panel which contains the following features:

- Pre-arranging of interventions
- Overview of current intervention metrics - due interventions, total number of patients and upcoming deadlines.
- Itemised list of current intervention patients



Header

Welcome Message

Metric1 Metric2 Metric3

Intervention Booking

Select User (type to autocomplete)

Select Priority Level

Submit

| Intervention List |           |
|-------------------|-----------|
| Name              | ID        |
| ExampleName1      | ExampleID |

Calendar

Upcoming Deadlines

Footer

Figure 20: Mockup of Intervention questionnaire

## 2.4 Non-Functional Requirements

Considering the non functional requirements is crucial to ensure the seamless operation and efficacy of our well-being monitoring platform. While the primary focus is on capturing data about and enhancing the well-being of the user base through both a simple, non intrusive questionnaire and an activity challenge system, non-functional requirements play an essential role in shaping the overall user experience, scalability and system performance. Such attributes are essential to consider, given that the application requires consistent engagement from its users to maintain full effectiveness.

### 2.4.1 Accessibility from Various Devices

- Accessibility from various devices is a critical non-functional requirement for the application, as it ensures the platform can be accessed and utilised across different devices and screen sizes. This requirement is essential for providing a consistent user experience and ensuring that employees are able to engage with the well-being monitoring system regardless of their device.

As well as this, accessibility from various devices contributes to the scalability of the platform as it allows for broader reach and adoption among employees, especially those that do not have a full time working environment. This is crucial for accommodating growth and ensuring that the platform remains effective universally.

- There are a number of factors to be considered:
  - Screen size and orientation  
This can be accommodated through designing the interface using responsive design techniques, which allows the content to adapt based on the device's screen size and orientation. This allows it to remain usable and visually appealing on a wide range of devices.
  - Performance Optimisation  
Optimising the performance of the application to ensure fast loading times is essential to ensure older devices are capable of engaging with the platform with smooth interaction. This can be done by minimising the file sizes and the amount of requests. This will also reduce the strain on the hosting platform, should the scale need to massively increase.
  - Touch-Friendly Navigation  
To ensure ease of access across all devices, it is important that the site is optimised for touch interaction on devices that have touchscreen capability. We can achieve this through using larger touch targets and spacing between elements.

### 2.4.2 Security

Security is an important requirement for Eunoias, considering the confidential nature of the user data involved in the well-being monitoring process and the intervention system. The platform must comply with strict security measures to protect sensitive information from unauthorised access and data breaches.

Through our usage of Supabase, all data is encrypted at rest with AES-256 and in transit via TLS. This ensures that user information is protected against malicious activity.<sup>[14]</sup> It also provides built in authentication features to assure that data is protected against unauthorised access.

It is important that access control mechanisms are implemented to restrict access to confidential user data based on roles and permissions. With our use of the Clerk authentication system, we can create and assign roles with various levels of permissions to ensure that data is accessible by only those who are authorised to do so. As well as this, Clerk boasts industry-standard authentication protocols, and conducts regular audits (such as SOC 2 Type 2 verification), penetration tests and vulnerability assessments.

### 2.4.3 Scalability

It is essential that, while developing the application, scalability is considered to account for a larger user base in the future. There are three primary aspects - database scalability, horizontal scalability and vertical scalability.

- Supabase provides a scalable and high-performance database backend powered by PostgreSQL. PostgreSQL is known for its scalability and support for advanced features, making it well suited for handling large volumes of data. Supabase's managed infrastructure for hosting databases, authentication and file structure can scale horizontally by adding read replicas and vertically by upgrading hardware specifications as required. This ensures that the database can grow seamlessly alongside Eunoias' user base and workload.
- It is important that the frameworks, technologies and APIs used during development are all scalable to handle an increased amount of user activity.
  - Supabase's free plan provides a limited amount of storage (500MB), computational capacity and bandwidth. When looking to increase the scale of the application, we would have to look at purchasing a paid plan from Supabase to handle the increased user traffic and required storage capacity.
  - When applying the application to a real-world environment, it is essential to purchase a paid plan of Clerk. This is because of its audit log feature, which would play an important role in our responsibility of data protection. Furthermore, Clerk has a capacity of 10,000 users under the free plan, which we may need to expand.
  - Google Fit API is fully scalable and has no additional costs associated.

As per our project constraints, we are limited to usage of only free means of hosting. This means that should there be a sudden upscale in users, we would face various hardware bottlenecks. This would mean that a shift to a paid hosting service with upgraded hardware specifications, such as CPU, memory and storage capacity.

## 2.5 Important Considerations

During the designing stage, we had to consider who would be viewing our website. Firstly, we needed to have a user-centric design that would be compliant with standards for accessibility such as the WCAG 2.1 and the UK 2010 Equality Act. We facilitated access for users with disabilities such as visual impairment by adapting some of the design features to be intuitive and relatively large. We decided it is important to have regular usability tests, which will be of utmost importance in collecting user feedback and supporting iterative improvements on the design and further accommodating people with disabilities.

There are also ethical considerations and legal compliance. To prevent the algorithms that produce health insights from being biased towards age, gender, ethnicity or any other factor, extra caution will be taken. Periodic reviews and updates shall be done on these algorithms to tackle likely bias. We designed a policy page, that informs users what data is used and how we handle that information. Furthermore, we designed to have account settings that allows the user to change some of their information such as username, emails and connected accounts. Also the user will have the ability to delete their account, which will delete their information that is stored in Supabase. These designed implementations honour data regulations such as the 2008 Data Protection Act.

### 2.5.1 Use Cases

The main goal of the Eunoias app is to improve workplace wellness by promoting frequent interactions between the platform and its users, who consist of both staff members and managers. The use case diagram presents a visual illustration of these interactions, demonstrating the range of functions users have for overseeing and intervening in mental and physical health in the workplace.

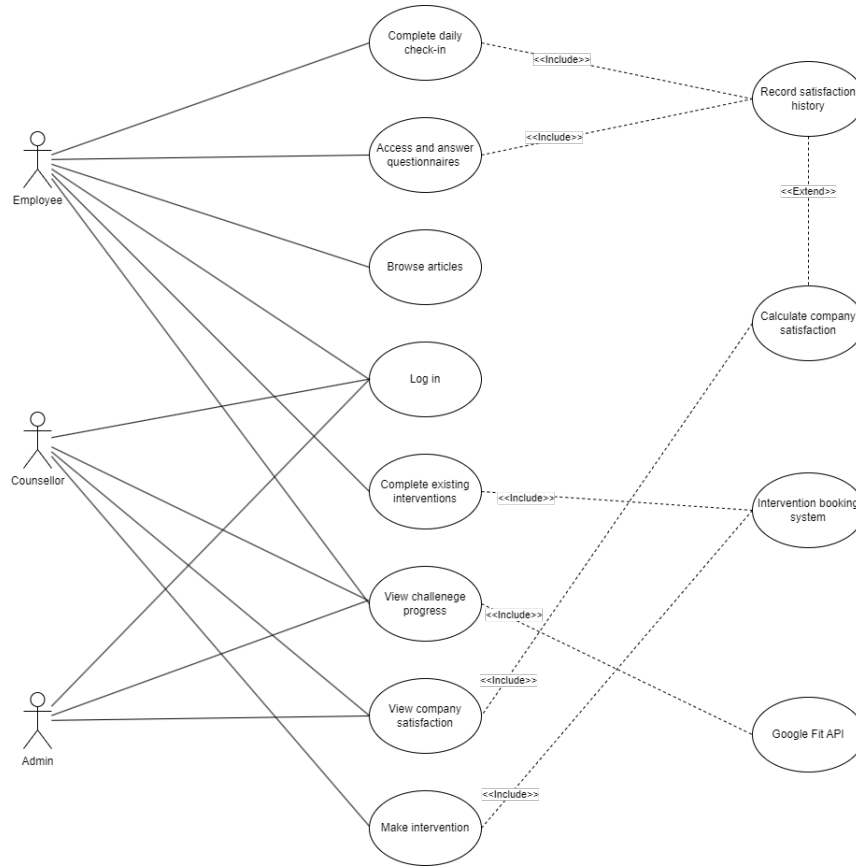


Figure 21: Use Case Diagram

Staff mainly engage with the system by participating in daily check-ins, during which they are asked to fill out a short survey regarding their current well-being. This regular practice is crucial because it collects daily information to track patterns and specific requirements as time progresses. Furthermore, workers can further involve themselves in their well-being by accessing and completing more detailed surveys. These are created to explore different aspects of mental and physical health more profoundly, offering a more comprehensive dataset for employees and employers to comprehend the work environment better. Employees can peruse articles on health and wellness for both relaxation and learning, which helps enhance their knowledge and empowerment regarding mental health.

Employers, however, utilize the system to acquire tools and information that assist them in better team management. A crucial feature is the capability to document and observe the past employee satisfaction records. This allows employers to monitor fluctuations over time and recognize trends that could signal new problems or advancements. Another key aspect is the capability to assess overall satisfaction within the company, by collecting input from employees to offer a quick look at the company's well-being, assisting in making strategic decisions.

## 3 Implementation

### 3.1 Introduction

The implementation phase of the project is crucial as it transforms our conceptual designs and planned features into a functioning web application. This phase involves a detailed, hands-on approach where each feature is developed, integrated, and tested to ensure that it meets the predefined requirements and

objectives set during the design phase. By adhering strictly to our project road map and leveraging agile methodologies, we aim to maintain flexibility and adaptability throughout the development process, allowing us to efficiently address any challenges or changes in scope that arise.

### **3.2 Implementation Methodology**

We adopted an agile implementation methodology, specifically Scrum, to allow for iterative development and continuous integration of features. This approach supports regular evaluation of the project's progress and functionality, encouraging flexibility and rapid pivoting where necessary. Weekly meetings ensured everyone was kept up to date on the progress of tasks that each team member has been assigned. This method ensured that features were developed in parallel, optimizing resource use and timeline efficiency.

### **3.3 Frameworks**

We took advantage of cutting edge frameworks to develop our application. Next.js was used to develop both our front and back end. Paired with Typescript and Tailwind CSS we had a tool kit made up of modern and up to date components to create Eunoias.

### **3.4 Front-end Implementation**

The front-end implementation focused on creating an intuitive user interface that aligns with our design principles of accessibility and user-friendliness. Next.js's component-based architecture allowed us to build reusable UI components that enhanced consistency across the application. The implementation was guided by an atomic design methodology, which broke down the interface into fundamental building blocks, ensuring that the UI is scalable and maintainable.

### **3.5 Back-end Implementation**

The backend implementation of the Eunoias application leverages several robust technologies to ensure seamless functionality and scalability. We chose Next.js for its ability to handle both server-side and client-side operations, making it easier to manage API routes and streamline backend processes. This allows us to create a unified development environment where both the frontend and backend are tightly integrated. For our database solution, we implemented Supabase, a scalable backend platform built on PostgreSQL. Supabase offers real-time functionalities, enabling us to listen to database changes and synchronize user data efficiently. Additionally, we integrated the Google Fit API to track users' steps taken which are used to monitor and encourage participation in our wellness challenges. To provide users with valuable mental health resources, we utilized the NHS API, allowing us to seamlessly incorporate relevant articles and support materials into the application.

### **3.6 Unit Testing**

Our application development process emphasises on rigorous unit test procedure to cover functionality, secure features and better user experience. Our testing processes strongly based on industry standard, designed to ensure complete coverage of all aspects thereby boosting the reliability and integrity of the application.

This methodology is used for both external/internal links where automation tools are applied to validate 'href' and 'target' attributes that make sure links are safe, directing user accurately. We rely on security testing standards, which allow us to fully identify URL redirection vulnerabilities in order to prevent potential security threats.

In order to simulate various component outcomes through user interactions, we utilise Jest which is well-known testing framework. This ensures that every UI component performs its task as expected and interacts properly with other parts. A guide for UI testing according to relevant researches highlights front-end's coherence significance in terms of customer satisfaction leading to solid applications.

Implemented features such as Intervention System, Daily Notification System, And Challenges go through Functional and Integration Testing. They operate seamlessly within the Large Application Ecosystem and provide their intended psychological and engagement benefits.

Database Integrity and Security our tests ensure that all data management within the application is GDPR and other privacy laws compliant. We maintain a high level of data security through automated scripts verifying data accuracy as well as security penetration testing. These practices are backed by case on the effects of data breaches and the immense significance of safeguarding user data.

The navigation system of the application is tested on multiple devices and browser to ensure its functionality and responsiveness. This testing helps in maintaining a good user experience.

While carrying out tests, it is important to refer to ethical issues like data privacy and user consent. In addition, the application's data collection mechanisms are open while conformed to legal requirements so that user can control their information personally.

Implementation of testing protocols in detail shows that we are committed to creating a strong and safe application. It also helps using maintaining high ethical and social norms by grounding our testing strategies in research and best practices of development. By doing this, the trustworthiness, inclusivity and efficiency of the app will be enhanced.

### 3.7 Code Reviews

While developing our application, we placed a significant emphasis on the practice of code reviews. This process is essential to ensure the quality and reliability of our code and to maintain a high standard of coding practice among all team members. Code reviews involve a systematic examination of source code by one or more team members other than the original author. The primary goals are to identify potential errors overlooked in the initial development phase, ensure adherence to our established coding standards, and enhance the code's maintainability and functionality.

During our code reviews, we focus on several key aspects. First, we assess the clarity and maintainability of the code. This includes evaluating the use of meaningful variable and function names, appropriate commenting, and the overall design of the code structure. We also scrutinize the code for consistency with our predefined coding guidelines that encompass stylistic conventions, architectural patterns, and performance considerations.

Our code review process begins when developers submit their code changes through pull requests. These changes are then reviewed by one or more team members. During the review, we check if the code follows our coding standards, is clear and efficient, and integrates well with the existing code. This collaborative process helps catch bugs early and ensures everyone understands the code.

We use tools such as GitLab to manage our code reviews. GitLab allows us to comment on specific lines of code, suggest improvements, and track changes. It also supports automated testing to ensure all code changes are validated before being merged. Using GitLab, we keep our review process organized and efficient, supporting our agile development approach.

Additionally, code reviews help us learn and grow as a team. By reviewing each other's work, we gain new insights and improve our coding skills. This process encourages open communication and constructive feedback, benefiting both individual developers and the team. Regular and careful code reviews ensure our application meets high standards of software quality.

By institutionalizing code reviews in our development workflow, we ensure that every piece of code is rigorously examined before integration into the main project. This practice not only reduces the likelihood of introducing defects into the production environment but also ensures that our application remains robust, efficient, and aligned with the latest industry standards. Through these meticulous reviews, we uphold the academic integrity and technical excellence of our project.

### 3.8 Code Style

Throughout the development of our application, we have emphasized the importance of a uniform code style to ensure the readability, maintainability, and consistency of our code. As a collaborative project involving multiple contributors, clear coding standards are essential. These standards encompass conventions on the formatting, naming, commenting, and structuring of code, which facilitate seamless collaboration and understanding among team members.

We employ the Next.js framework alongside TypeScript and TailwindCSS, establishing comprehensive style guidelines that dictate naming conventions for variables and functions to clearly convey their functions, formatting rules for code blocks to enhance readability, and detailed commenting to document the code effectively. To enforce these guidelines, we integrate tools such as ESLint into our workflow. ESLint serves as a static code analysis tool that not only enforces our coding style but also identifies syntax errors and suggests improvements to code quality.

The integration of these tools within our development processes ensures all code commits meet our standards before merging into the main branch. This practice minimizes the risk of bugs and errors associated with inconsistent coding practices and helps maintain the code's cleanliness and organization.

### 3.9 Ethical, Legal and Social Considerations

Compliance with legal requirements was ensured during the implementation phase by integrating secure data protection and privacy measures to the fullest. There were consent means put in place to communicate effectively to users about data collection and utilization. Under GDPR and Data Protection Act 2008, our privacy policy page articulates on types of data collected, purposes for use, and security protocols. We also through this way, only allowed people (counsellors) who have been given authority that can get into sensitive information. It reduces the chances of unauthorized access while making sure that personal details are handled by mental health professionals. For our secure sign-in features, we used Clerk and incorporated its SOC 2 Type 2 as well as CCPA compliance together with adding two-step verification for more security.

During implementation, ethical considerations have also taken place. We made sure the data collected was limited to the information necessary to promote employee wellness. We only collect data such as data related to website activity, and basic health information such as daily steps taken. How we handle customer information is made in the privacy page of our website. We also ensured the algorithms that produce health insights are not biased towards age, gender, ethnicity, or any other factors. Periodic reviews and updates were done to tackle bias. We implemented the delete function so the user can delete their account, which will delete their information that is stored in Supabase.

Social considerations were heavily taken place during implementation. We needed to promote wellness and generate a corporate culture of employee health, where users feel that data is used for their benefit and assistance. We done this by implementing wellness-centric features. For example, we implemented

the NHS Mental Health API that provides NHS articles (such as “5 steps to mental wellbeing”) that was integrated in the middle of the dashboard to support users with specific health needs. Furthermore, in the self-book option of our intervention system, we provided users the option to choose the specific counsellor they would like to get referred to, which allows the user to feel more comfortable and have more freedom to whom they share their information with. In addition, we made sure the questions that were asked of the user were not too invasive and gave users multiple choice answers which they could select. This was implemented as it is time-efficient for the user and makes it more comfortable for users to provide more honest answers, especially on a topic like their workplace environment.

## 4 Evaluation

### 4.1 Overview

The evaluation phase is critical to assess the effectiveness and impact of the web application against the project’s objectives and user requirements. This phase involves a series of systematic tests, feedback sessions, and performance evaluations to ensure that the application not only functions as intended but also meets the needs of the end-users effectively. In our application development, it is important to comprehend the benefits of the project and areas that need to be improved in order for ongoing process.

### 4.2 Evaluation Criteria: Deliverables

To evaluate the main results of the project, we compared what is supposed to be done (stated in the Evaluation criteria of PDD) and what has been done. The key deliverables include the rating system and intervention system. We measured the success of our project through a final usability test of all our features in the application, and based on the user feedback we conducted a final evaluation.

#### **Intervention System**

The expected outcome of the intervention system is that it would allow employers and employees to raise tickets, while also providing the organization with the option of adding more users to the raised tickets. They must have states which represent the current progress of the intervention.

The system of intervention has been finished to specification and additional features were added. The tickets could be submitted by both employees and employers through 2 panels; Pre-booked and Self-Book. The pre-booked option allows the user to enter a reference number, which is provided to them through email from an appointed councillor. The self-book option allows the user to choose a counsellor they were like to be referred to and choose the severity of the raised concern (D – being least severe to A – most severe). These are additional implementations to make users feel more comfortable at requesting support. In the system itself, the user is provided with 6 multiple choice questions about the state of their mental health in their workplace environment. The progress of completion of these questions is positioned at the top of the page, with every completed question being represented with a green tick icon. Once the user completes the form, an animation pops up showing that the submission is successful and provides a button for the user to be directed to the homepage. Through role-based access control, councillors have access to the councillor’s page where they can book an appointment with a patient ID. The page has other features such as: list showing already booked names of patients and their IDs, personal calendar, and a display of upcoming deadlines. This implementation significantly improves their workflow and allows councillors to easily manage their patients.

Overall, this deliverable is a success, as it provides both employers and employees to book an appointment, clearly states the progress of each intervention and questionnaire being entirely functional, thus making the system transparent and effective for all stakeholders. However, through our usability tests an additional implementation that could have benefited the system ticket is not letting the user bypass validation, which as a result could lead to incorrect data handling.

### **Rating System**

One of the expected features of the rating system is that the user must be alerted in an unobtrusive and convenient way so they can complete their rating during the working day. The rating system must be easy to complete, and each questionnaire must take no longer than 30 seconds to submit. Data should be collected using simple sliders or multiple choice, with very few questions requiring user text input for convenience's sake. The rating system was finished as mostly envisioned.

A small-scaled notification comes up at the bottom right of the page with the message "What's going on?", prompting the user to continue. After clicking continue, the prompt expands which presents a simple "Rate your mood from 1-5" multiple choice question with the submit button. This questionnaire is made compulsory to answer in able for the user to submit. The answer from these daily forms gives the qualitative data that updates the summary aspect of dashboard through server-side batch processing. The summary section includes the current streak (the number of times the user completed the form), interaction and rank values (the ranking between employers based on the quantity of forms done). The current streak value represents how many days in a row they users engaged with the platform. The interaction value is calculated through a combination of the user's engagement, their self-report feedback, and participation in physical activity challenges, and is updated by the end of the week. The rank value is the ranking between employers based on the quantity of forms done. These metrics that show the user's engagement encourage employees to participate in the completion of the daily forms, and as a result allows employers to assess the situation of employee's wellbeing within their company. Employers get notified through email and Microsoft Teams at a random time throughout the day to complete the daily form, following the 'BeReal'-esque format.

Through evaluation, we think this deliverable is a success because through usability tests it effectively captured user feedback and contributed valuable insights into user well-being. The notifications were integrated in a manner where it wasn't much user-intrusive and interrupting (due to its small scale and the option to close them). Furthermore, the form only consists of one multiple choice question which makes completion very time-efficient and easy for the user. Further implementations could be added in the future like slight variation in the questions that are asked daily, to avoid the form being too repetitive for the users to answer. In addition, we expected to have more questions, but resulted into having just one as we believe it is sufficient for data processing and is easier for the employees.

### **4.3 Evaluation Criteria: Design**

During the design of our application, we carefully planned and evaluated to ensure that we implemented features effectively while minimizing risks and maximizing team efficiency. Thorough consideration was given to key criteria like data protection regulations, meeting project constraints, selection of technologies and frameworks as well as integration with other features. The software we used for designing the different pages (screenshots provided throughout the design section) was the platform draw.io as it has advanced design tools integrated in its interface, providing us more control in designing. We also incorporated flow charts and ERD diagrams for certain functionalities, to help us visualise their process, which were made in Draw.io (a free online diagram software). Through usability tests, we evaluated the design aspect of the website. The user interface had been designed in such a way that it can be accessible by many people following WCAG 2.1 and UK Equality Act 2010 which contain design implementations made for visually impaired users. These are also shown on the user and administrator dashboards in addition to providing an overview of some relevant metrics or functions they offer for a comprehensible sense of the users' mental

health status. Colour scheme as well as light/dark adaptability modes were selected to improve usability and inclusiveness. Each page is designed to be consistent with one another and is on theme with mental wellbeing. To ensure a streamlined and compliant user experience, security privacy and ethical standards were taken into cognition during incorporation of functionalities such as user authentication, daily check-ins, challenge systems, ratings by users and interventions system. The design stage of our project showed clearly how to implement the various functionalities, indicating exactly what to incorporate for each one and how it would look after the implementation stage.

Overall, the design of the website balances visual appeal with functionality while considering ethical responsibilities, making it an exceptional website design. We done extensive research that benefited the design; we looked at colour theory, legal research and conducted competitor analysis on similar applications to ours such as Yumuv. One of our biggest concerns was the navigation aspect of our website, since we have so many features integrated, we assumed it would overwhelm the user and can trap the user in certain pages. However, the final design of the implemented product appears to be easy to navigate through from our conducted usability tests. One design addition that could be created is user personalisation, where they can personalise their own dashboard with their own colour preference and offer recommendations (such as particular NHS articles) based on their behaviour and preferences.

#### 4.4 Evaluation Criteria: Implementation

The project's implementation stage was bringing the designed functionalities to life, using a combination of various frameworks, libraries, APIs, and other utilities. This evaluation presents some examples of the decided utilities we used and why we settled on utilizing them., throughout the front-end and back-end of our application. The insights received from the iterative usability tests were quite critical in helping to refine the application, and further implementations were made based on the results from them.

NHS Mental Health has successfully been integrated for it to appear at the centre of the dashboard. The NHS Mental Health delivers complete and clinically substantiated details and advice on mental health conditions, which is used as our main access point of information for the employer to use. We chose this API, rather than the other Mental health APIs such as BetterHelp and Ginger.io due to a couple of reasons. Firstly, we wanted the API to be more content oriented rather than service oriented, so therefore the 2 other APIs didn't fit into the category. Secondly, NHS is a more trusted source as it is the UK's official health organisation, making information appear more reliable and relevant to our users.

Microsoft Graph API was meant to be integrated to adapt and show the number of challenges complete as part of the summary aspect of the dashboard, however, it needed required verification which we believe we could not get.

We used Google Fit API for viewing data on the user's physical activities, which automatically logs data such as the quantity of steps taken and is presented in the dashboard. We chose to use Google Fit as our main fitness tracker due to several factors. Google provides a wide range of developer support and documentation for the integration of the API, more than its other competitors. It is also free to use, and most users have googled accounts, therefore it removes the need for users to make additional accounts to use our service. Further down the line when the scalability of our project increases, we can incorporate other APIs, such as Apple HealthKit, to accommodate users that are in the IOS ecosystem.

Our toolkit consisted of Typescript and Tailwind CSS, paired with the Node.js framework. Traditional CSS is the fundamental way to go about styling pages however we opted to use tailwind CSS library that uses pre-built classes to style elements, giving us more customisation in the front-end of the website. We chose to use the Node.js framework compared to other frameworks such as Sails.js and KOA. Firstly, Node.js is the most popular framework out of the bunch, which has a vast community that support developers like us, and many different plugins are provided. In addition, Node.js is a simple and minimalist framework to use compared to the other two, resulting in implementation more time efficient. However,

the other 2 options, have features that would put them having an advantage over Node.js such as error as error handling features from KOA and built-in database integration from Sails (as it is implemented with Waterline). In conclusion, we decided it was best to use Node.js as it provided the best foundation for development.

## 4.5 Evaluation Criteria: Testing

The testing of our application is represented in the Test Plan of our audit report. The test plan is a very detailed table that addresses major areas of functionality, security, usability, and compliance that are necessary in a stable web application. It takes on a calculated approach in bringing out problems within end and back components for this application. There are automated and manual types of testing integrated so that overall coverage of the website is assured. Furthermore, the test plan clearly states the requirements concerning the data privacy and security, especially in tests that deal with data handling and user authentication (e.g., Test 2.1.4). It makes sure that the information is encrypted, can be accessed only by permission, and complies with GDPR. These standards are crucial in creating trust and maintaining ethical approach towards users' personal data. We tested everything that was needed to be tested as stated in the PDD, which includes: overall functionality, implemented features, the database, website navigation and user acceptance.

For picking our testing framework, we had many options to choose from such as Jest, Jasmine, and Cypress. Jest have some significant advantages over these options. Jest has a unique feature called Snapshot testing which is highly effective at catching unintended changes in React component outputs, which instantly made it appealing for us to use since we are using the React library. Jest also requires very minimal set-up to start testing with, whereas other frameworks like Jasmine require more configuration when it is integrated with React. Furthermore, additional libraries might be needed with other frameworks for functionalities like mocking and isolation (very beneficial for unit testing), which Jest provides already. Finally, Jest runs parallel tests, improving performance and accelerating the testing process especially as the project scale increases. However, Jasmine and Cypress have other functionalities that can make them preferable to use over Jest. For example, Jasmine offers more flexibility in configuring the test environment and choosing libraries, giving developers more freedom in the set up. Whereas Cypress has an end-to-end testing feature that offers a more complete testing environment that has visual feedback and an easier time handling asynchronous operations correctly. Overall, a few factors make Jest the ideal choice for our application as it includes good integration with the React library, as well as specific functionalities like snapshot testing that suits React projects like ours. Besides, it enables agile development through fast testing cycles of components without elaborate setup and configuration, which was beneficial to us as we employed the SCRUM methodology and our time in the span of the project was very limited.

## 4.6 Team Satisfaction

In the evaluation of team satisfaction, members of the team have a sense of accomplishment and contentment regarding how far they have come with the project. We were able to meet a lot of critical milestones on time during the entire project life cycle which indicates how well we planned and executed our tasks. Admittedly, have had periods of time where process of development was slow, and some tasks weren't managed quick enough. However, we still managed to complete the requirements. As such, high levels of satisfaction were reported by this team on progress of the project where all stakeholders such as our project sponsor could receive transparent communication as well as frequent updates so that everyone was well informed and motivated to work towards a common goal. Successfully reaching objective goals not only confirmed our self-confidence but also developed our excitement for more projects like this one.

## 5 Reflection

### 5.1 Team Reflection

#### 5.1.1 Project Charter

While the Team Charter initially outlined specific roles for each team member and provided a foundational framework for engagement and group meeting standards, adherence to these guidelines degraded over the course of the development cycle. Meetings were missed, and individuals often failed to perform tasks outside of their assigned roles.

As the guidelines were not followed, it shows that team processes should be constantly evaluated and adjusted to better fit the present dynamics of the group over the course of development. Further to this, the project manager should undergo proactive enforcement of the Team Charter to ensure all members are in compliance. Further to this, having set criteria for which members are graded in the group scaling form would avoid conflict in the future.

The adoption of fixed roles may have hindered the development process, as the majority of members did not perform work outside of their general responsibilities. By removing these in future projects, we could adopt a more flexible and dynamic approach of project execution which may have better suited our team.

#### 5.1.2 Project Scope

Generally, the team is content with the breadth and depth of the project scope. The scope allows for the problem statement to be met effectively, and does not suffer from unnecessary bloat which would complicate the design and implementation process. We attribute this to our initial planning phase, during which team cohesion and communication was very effective. Through this, potential areas of scope creep and ambiguity were addressed early on.

During this crucial stage, the team laid a strong foundation for the success of the project. Through collectively defining project objectives, outlining deliverables and ensuring the project criteria and problem statement were met, the team ensured clarity in future stages. We agree that this was one of the successes of the project.

#### 5.1.3 Execution

Throughout the execution phase, our team maintained a commitment to ensuring scalability, with an emphasis on bolstering security, stability and adherence to strict data protection regulations given the sensitive nature of the data our application handles. By prioritising this, we mitigated the risk of bugs and errors accumulating during development which would slow us down at the end and ensured compliance with regulations as per the project criteria.

A notable misstep which emerged during execution was the team failing to handle work distribution effectively. This oversight led to a strained critical path, resulting in a failure in the timeline. Nevertheless, the team delivered a complex solution that satisfactorily met all project criteria and successfully addressed the assigned problem statement. Moving forward, the lessons learned from the stressful experience toward the end of the project would inform our approach to workload distribution. It reinforced the importance of maintaining a balanced execution to ensure timely project delivery without needing a rush at the last minute.

## 6 Tester Guide

### 6.1 Purpose

The Tester Guide is designed to facilitate comprehensive and effective testing of the Eunoias web application. It aims to ensure that the application fulfills all functional requirements specified in the PDD and acts as expected under a range of conditions. The Guide will assist testers through setting up the test environment, executing tests and reporting outcomes.

## 6.2 Scope of Testing

The scope of this guide covers a variety of testing aspects including unit, integration, system, and acceptance testing. Overall, confining testing the application's functionality, performance, authentication/authorisation, and compliance with data privacy laws such as GDPR.

## 6.3 Test Environment Setup

Software Requirements:

- Operating System: Windows 10 or higher, MacOS Mojave or higher
- Browsers: Up to date version of Firefox, Chrome, or Safari
- Up to date, stable version of Node.js

Accessing the dashboard- Use the following credentials for initial login for the 'User' role, the 'Counsellor' role and the 'Admin' role:

| Role       | Username/Email              | Password       |
|------------|-----------------------------|----------------|
| User       | usereuonias@gmail.com       | TempPassword24 |
| Counsellor | counselloreuonias@gmail.com | TempPassword23 |
| Admin      | managereuonias@gmail.com    | TempPassword22 |

## 6.4 Test Plan

| Eunoias: Test Plan                                                                               |                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Number                                                                                      | Requirement                                                                                                                                                                                                                                                                                                                                    | Expected Inputs                                                                                                                                                                                                                                                                         | Expected Results                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Test Evaluation                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2.1.1.1 (Outgoing Link Functionality)[4]                                                         | To ensure they point to the correct external sites, use correct protocol, and are secure.                                                                                                                                                                                                                                                      | External URLs using a range of protocols(HTTP, and HTTPS) and Descriptive labels for each link                                                                                                                                                                                          | The links correctly direct users to the specified external sites, use correct protocols for security, and are secure against redirection vulnerabilities, for instance open redirects.                                                                                                                                                                                                                                                                                | Automated testing to validate 'href' attributes and 'target' attributes for correct URL, security testing to assess vulnerability to URL redirection, and testing to check link renders correctly and directs to the specific external URL.                                                                                                                                                                                 |
| 2.1.1.2 (Internal Link Functionality)[4]                                                         | To ensure internal links accurately navigate within the application and handle errors suitably.                                                                                                                                                                                                                                                | Internal paths, and descriptive labels for each link.                                                                                                                                                                                                                                   | All permitted links must be accessible to all users, Invalid paths will display error messages, and valid internal paths will take user to intended page without errors.                                                                                                                                                                                                                                                                                              | Automated testing to check navigation accuracy and validate links go to the correct path, and error handling tests to ensure messages or pages are displayed when invalid paths are accessed.                                                                                                                                                                                                                               |
| 2.1.2 (Component Functionality)[4]                                                               | Verifying all UI components functions as expected, ensure components correctly interact with each other, and APIs simulate user interactions and validate outcomes.                                                                                                                                                                            | User actions for instance clicks, and data inputs that require processing across multiple components such as form submissions that trigger other UI elements.                                                                                                                           | Each component behaves accurately, executing actions without errors, data flows accurately between components and any associated APIs without loss and, updates are reflected in the UI.                                                                                                                                                                                                                                                                              | Utilising jest allows to simulate user interactions and verify outcomes. Additionally, check the connectivity and data handling between components and backend services.                                                                                                                                                                                                                                                    |
| 2.1.3 Implemented Features (Intervention System and Daily Notification System and Challenges)[4] | Validate functionality and responsiveness of the Intervention System, allowing both employees and employers to initiate interventions. Ensure daily notifications are sent reliably at random times to users, prompting them to complete their 30 second well-being assessments. Test functionality of challenges, ensuring they engage users. | Creation of an intervention ticket by users, assignment of tasks within the ticket, updating and closing interventions. Notification will be triggered by system based on time and user activity patterns. Expected input for challenges will be users participating in challenges set. | System allows for seamless creation, updating, and closure of interventions. Notification are sent to relevant parties, and all updates are accurately reflected in real time. Notifications are sent consistently at varied times, are received by all active users, and successfully prompts the completion of tasks without errors. Challenges load correctly, capture user input precisely, and contributes to the user's overall well-being profile and metrics. | Functional testing simulates user actions for managing interventions, integration testing ensures works with notification system and user database. Notifications and Challenges - Functional testing to ensure notifications trigger expected user actions, usability testing ensuring challenges are easy to comprehend and are interactive, and integration testing confirming data flows correctly to and from backend. |

|                               |                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                            |                                                                                                                                                                                             |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2.1.4<br>(Database)[4]        | Ensure all data is entered into the database correctly and retrieved accurately. Verify the database adheres to security standards and privacy regulations such as GDPR, ensuring data is encrypted and access controls are enforced.                                                                                                              | User data submissions from various forms such as intervention details, and user profiles. Attempts to access or alter data by authorised and unauthorised users.                                                                                            | Data stored in database matches exactly with what was submitted by the users, queries retrieve data precisely. Only authorised users can access sensitive data, data encrypted at rest and in transit, and all access attempts are logged. | Automated testing with scripts that insert update, and retrieve data, checking for discrepancies/data loss, Security penetration tests, reviews of access of logs and encryption protocols. |
| 2.1.5 (Website Navigation)[4] | Verify all navigation links and menu items direct users to correct sections or pages within the application. Navigation elements must adjust and remain functional across devices and screen sizes including desktops, smartphones, and tablets. Navigation actions must be executed seamlessly to ensure a smooth user experience without delays. | Clicks on all navigation elements, including footer, and sidebar menu links. Accessing the application through different devices and adjusting window sizes. User actions that trigger navigation transitions, especially under varying network conditions. | Each click leads to correct destination without errors, and expandable menu functions as expected. Navigation adapts to different screen sizes and devices. Quick response times for all navigation actions, with minimal load times.      | Automated/Manual testing to confirm that all links are active and directs to right destination. Cross-browser and cross-device testing, and measuring load times and response rates         |

## 7 Tester Guide: Manual

This is the full guide on how to use Eunoias

### 7.1 Routes

- **Home Page:** /
- **Privacy Policy:** /privacy-policy
- **Dashboard:** /dashboard
- **Intervention System:** /personal/support
- **NHS Articles:** /nhs
- **NHS Guides Tools and Activities:** /nhs/guides-tools-and-activities
- **NHS Guides Tools and Activities Article:** /nhs/guides-tools-and-activities/[slug]
- **NHS Tips and Support:** /nhs/tips-and-support
- **NHS Tips and Support Article:** /nhs/tips-and-support/[slug]
- **Admin Panel:** /admin
- **Counsellor Dashboard:** /counsellor
- **Counsellor Response:** /counsellor\_view/[ReferenceNumber]

### 7.2 Core Navigation

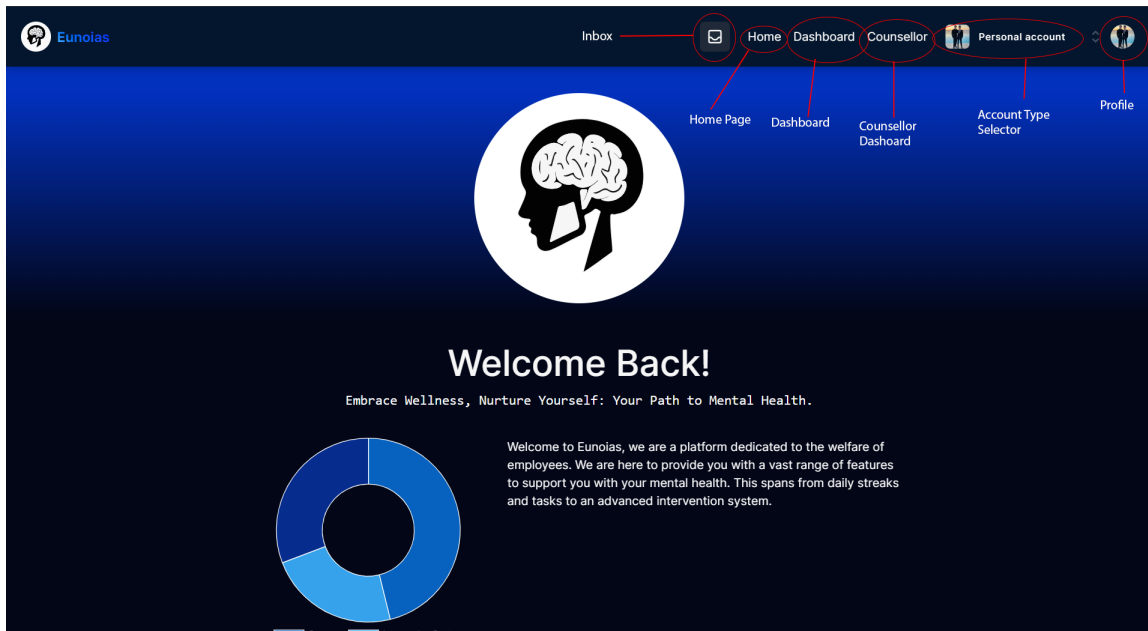


Figure 22: Home Page (With Counsellor Button)

The Home Page displays baseline information outlining the use case of the website, it also houses a header and footer like every other page.

### 7.2.1 Header

The header is composed of 6 UI elements

- **Inbox** The Inbox displays notifications such as be real pop ups that have been dismissed and or reference numbers assigned and or generated by the Intervention System.
- **Home** Redirects the user to the Home page through out the application.
- **Dashboard** Redirects the user to the User dashboard.
- **Counsellor** Redirects you to the Counsellor Dashboard, only accessible if the logged in user is a part of the Counsellor organisation in the Auth system.
- **Account Type Selector** This is a drop down box that allows the user to choose which organisation they are a part of. Allowing for Counsellors to use the website as both a Counsellor and as a Default User. The Counsellor organisation must be selected if available to the user in order to access the Counsellor Dashboard.
- **Profile** Allows the user to manage there account as well as sign out from the application.

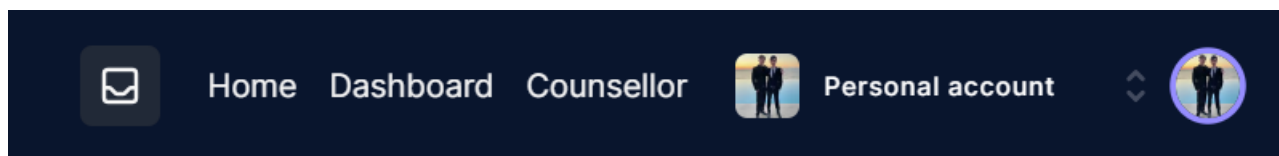


Figure 23: Header (With Counsellor Button)

### 7.2.2 Footer

- **Home** Redirects you to the Home page through out the application.
- **Privacy Policy** Redirects user to the privacy policy.
- **Contact Us** Redirects user to a page with our contact information.

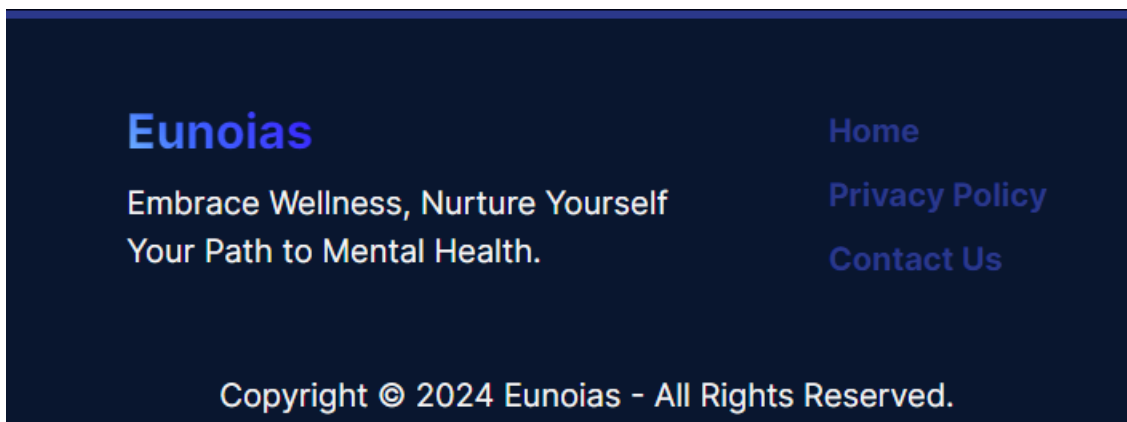


Figure 24: Footer

### 7.2.3 User Auth

- **Login** Presents the user with the Login Modal, with a selector for Sign-in and Sign-Up. The default modal state is Sign-In. *In order to take full advantage of the application logging in with Google is advised.*



Figure 25: Header (Not Logged In)

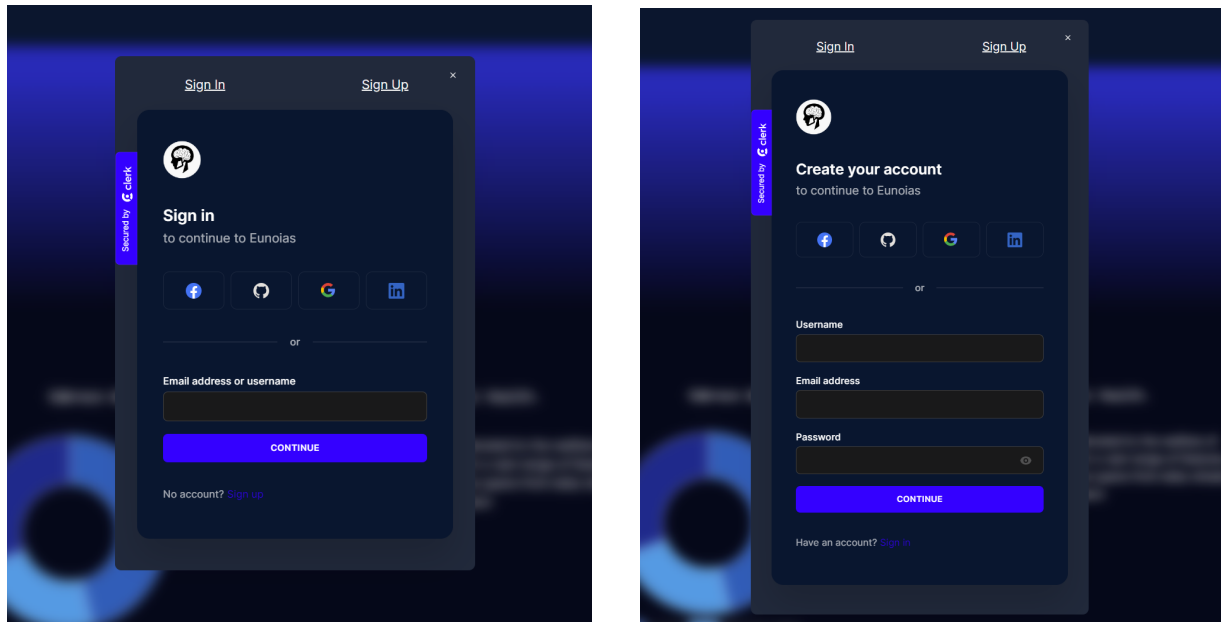


Figure 26: Sign In & Sign Up Panels

The user is given options of how they would like to sign in. If a user does not have an account with us they may use the sign up panel. In order to take advantage of step count and challenges. Once a user logs in they are re directed to the user dashboard.

## 7.3 Dashboard

The Dashboard is made up 5 components, each component covering a specific functionality for the user.

### 7.3.1 Profile

The profile segment shows the user a summary of there streak, interaction level and current ranking on the leaderboard.

### 7.3.2 Top bar

The top bar shows the user how long is left on the current weekly challenge, this is automatically updated at the end of each week whether the user has completed the challenge or not. Further more the user can click on the Request Support button to be directed to the Intervention System where the user can get help from the counselor. Further more the leader board button sends the user to the leader board page.

### 7.3.3 Articles

The article sections provides the user with articles directly from the NHS API, the user can go through the current list of articles by clicking the navigation arrows on the left and write or swiping the card in the desired direction. The view article button will direct the user to a page where they can read the entire article.

### 7.3.4 Steps

The steps component provides the user with there current step count for the day (Updated every 30 minutes) as well as shows the user there current progress on the weekly challenge.

### 7.3.5 Minor Challenges

The minor challenges sections shows the user a set of challenges they can accomplish within a short time span, completing these daily will add towards the users streak and interaction score.

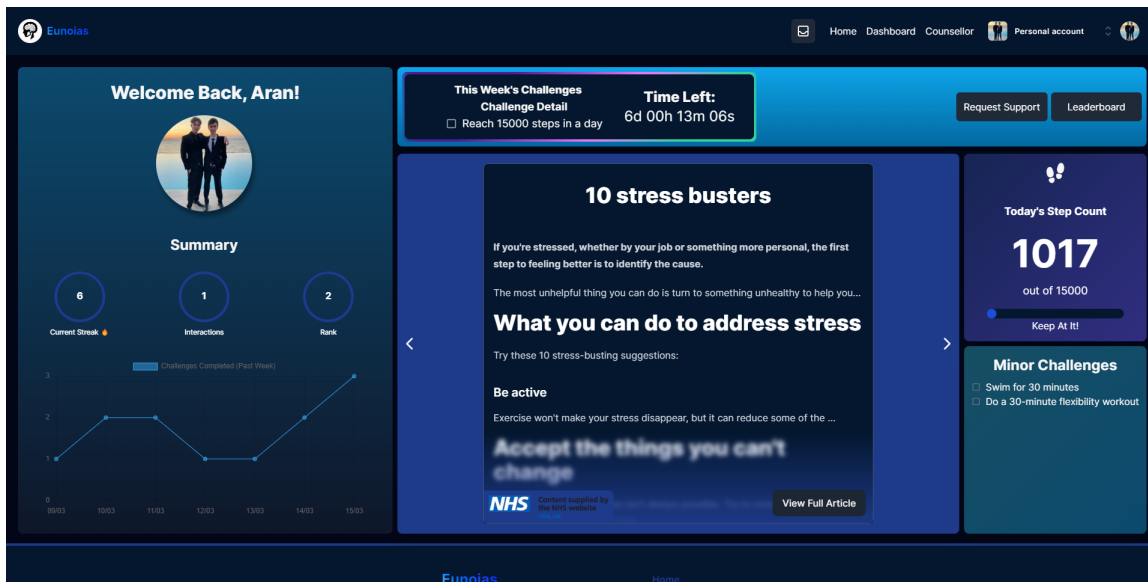


Figure 27: User Dashboard

The dashboard is the core of application, this page will have the most traffic and majority of all API calls will be from the dashboard.

## 7.4 Intervention System

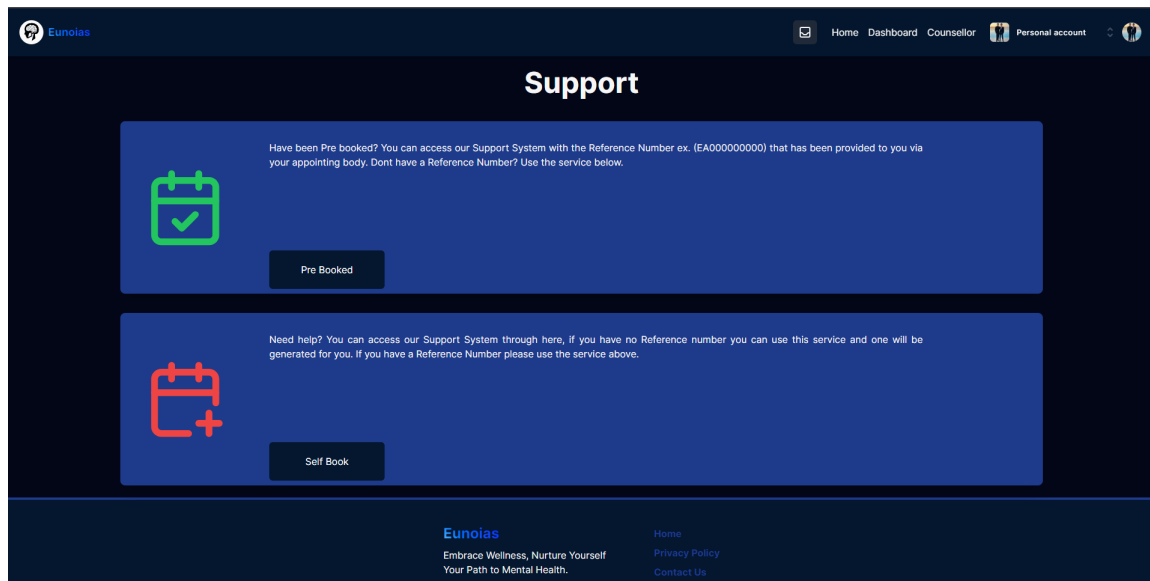


Figure 28: Main Page of Intervention System

The system has two work cases. First case is the Pre-Booked option a user has a Reference number, this number is provided via the inbox in the header when assigned by a counsellor and or an admin. The second case is the Self-Booking option it is when a user wants to self request the service. In this case the user can choose a counselor as well as a severity level and get assigned a Reference number, following which the user will be forwarded to the questionnaire system. If the user at any time decided to quit the questionnaire the reference number will remain active and they may return and continue answering the questions, users do not need to re submit questions they have filled in prior.

The screenshot shows two components of the expanded intervention log. The top component, labeled 'Need help? You can access our Support System through here, if you have no Reference number you can use this service and one will be generated for you. If you have a Reference Number please use the service above.', contains a red calendar icon with a plus sign. It has two dropdown menus: 'Counsellor' with the text 'Choose a counsellor' and 'Choose between the counsellors in your organisation.', and 'Severity' with the text 'What is the severity?' and 'Choose between the counsellors in your organisation.'. There is a 'Next' button at the bottom. The bottom component, labeled 'Have been Pre booked? You can access our Support System with the Reference Number ex. (EA000000000) that has been provided to you via your appointing body. Dont have a Reference Number? Use the service below.', contains a green calendar icon with a checkmark. It has a text input field labeled 'Enter Reference Number' with the text 'You should have received this in your email.' and a 'Submit' button at the bottom.

Figure 29: Expanded Intervention Log in Components

**Eunoias** Home Dashboard Counsellor Personal account

### Personal Support

**1. How manageable is your current workload?**

- ☐ 1 - Completely unmanageable
- ☐ 2 - Often unmanageable
- ☐ 3 - Manageable with effort
- ☐ 4 - Usually manageable
- ☐ 5 - Easily manageable

Next

**2. Do you feel you have enough time to complete your tasks effectively?**

- ☐ 1 - Never
- ☐ 2 - Rarely
- ☐ 3 - Sometimes
- ☐ 4 - Often
- ☐ 5 - Always

Figure 30: Intervention System Form

The user has a set of 5 questions, each time a user completes a question they must click next in order to send the answer to the database. Once they have answered all questions they may click submit to finalize the submission locking out there reference number from being re used.

**What's going on?** X

Just spend 30 seconds to tell us how it's going. Continue

Figure 31: Daily Pop Up Notification

A daily notification pops up at the bottom of the screen asking, "Tell us how it's going." Clicking it expands the notification to reveal a 1-5 rating scale. Users can quickly rate their current well-being and submit their answer, which is then recorded for tracking purposes.

## 7.5 Challenges

**This Week's Challenges**

Challenge Detail

☐ Reach 15000 steps in a day

**Time Left:** 6d 00h 13m 06s

Figure 32: Current Challenge Section

The current challenges are showed above and this one requires participants to reach 15,000 steps in a single day. Accompanying the challenge is a countdown timer indicating the remaining time to complete the challenge. This timer helps users stay aware of the deadline, encouraging them to engage in the challenge and track their progress. This feature integrates with the Google Fit API to automatically log steps

## 7.6 Counsellor

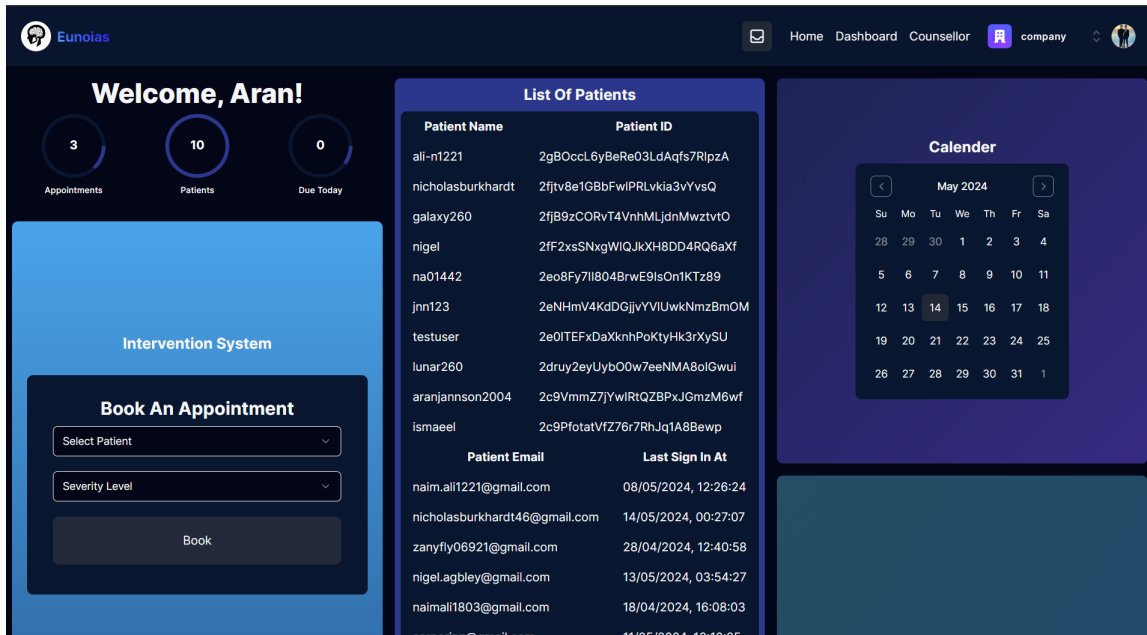


Figure 33: Counsellor Dashboard

The dashboard welcomes the counsellor by name and displays key statistics at the top, including the total number of appointments, the number of patients, and tasks due today. The intervention system allows counsellors to book appointments by selecting a patient and the severity level of the intervention required. The patient list provides detailed information about each patient, including their name, patient ID, email, and the last time they signed in. This helps counsellors keep track of their patients and their engagement with the system. Additionally, the calendar feature enables counsellors to view and manage their schedule, ensuring they are aware of upcoming appointments and important dates. The bottom right panel, highlighted in green, displays upcoming deadlines, helping counsellors stay on top of critical tasks and ensure timely interventions.

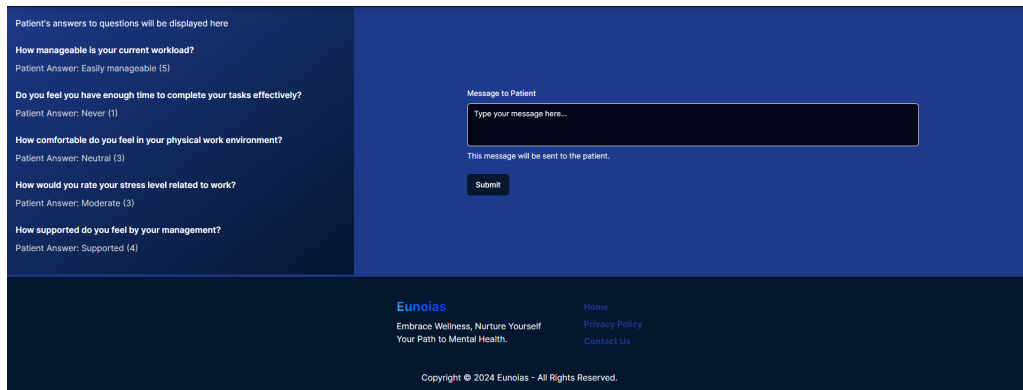


Figure 34: Counsellor Response Page

This interface displays a counsellor's view of a patient's responses to well-being questions. Additionally, there is a message box for the counsellor to send personalized messages to the patient, facilitating direct communication and support.

## 7.7 Admin

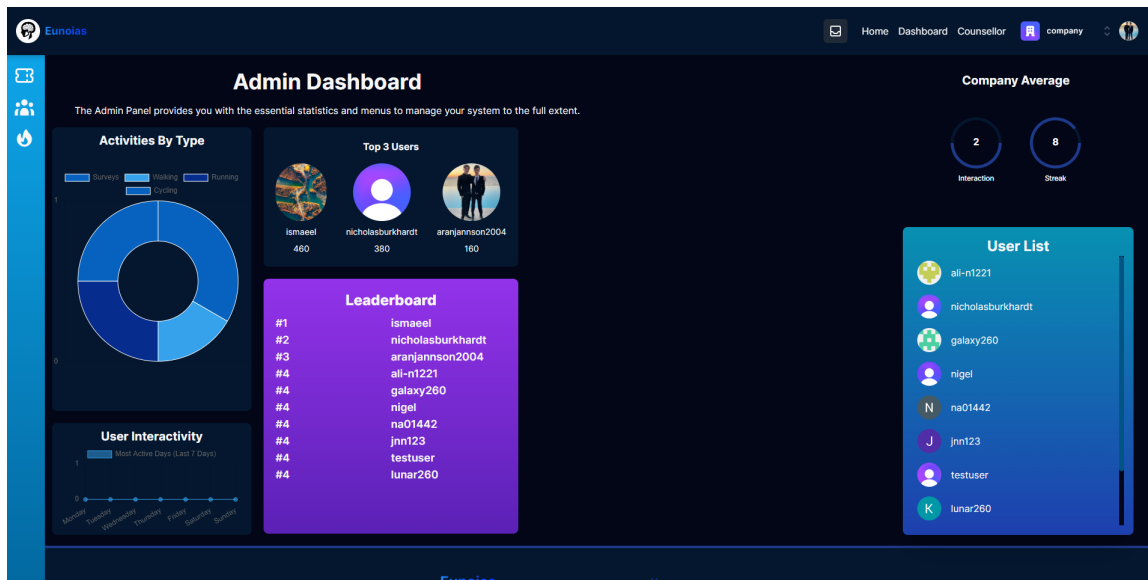


Figure 35: Admin Panel

The panel includes a graphical representation of activities by type, displaying the distribution of surveys, walking and running activities among users. It highlights the top three users based on their activity scores, showcasing their engagement within the application. Additionally, the leaderboard ranks users by their activity levels, fostering a sense of competition and motivation. The dashboard also presents a user interactivity chart, indicating the most active days over the past week, which helps administrators track engagement patterns. The company average section provides an overview of key metrics, such as interaction and streak, offering insights into overall user participation. Finally, the user list displays all registered users, allowing administrators to easily access and manage user information. These features collectively enable administrators to monitor, analyze, and enhance user engagement and well-being within the workplace.

## 8 Appendix

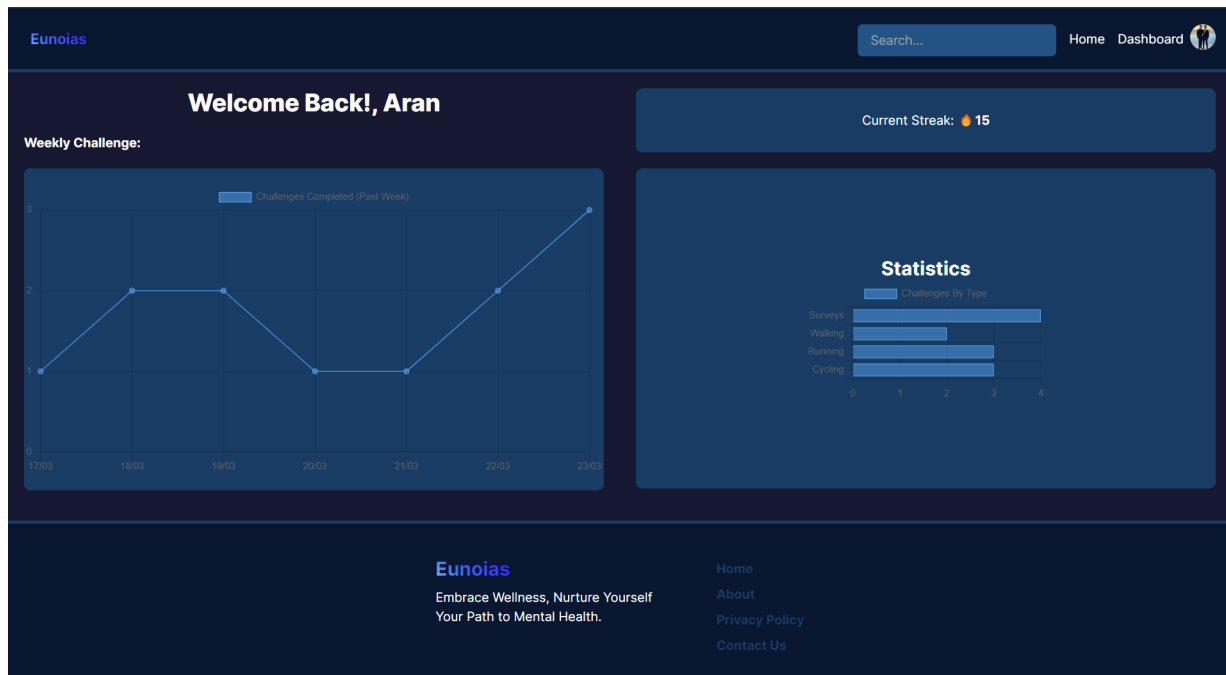


Figure 36: Original Layout

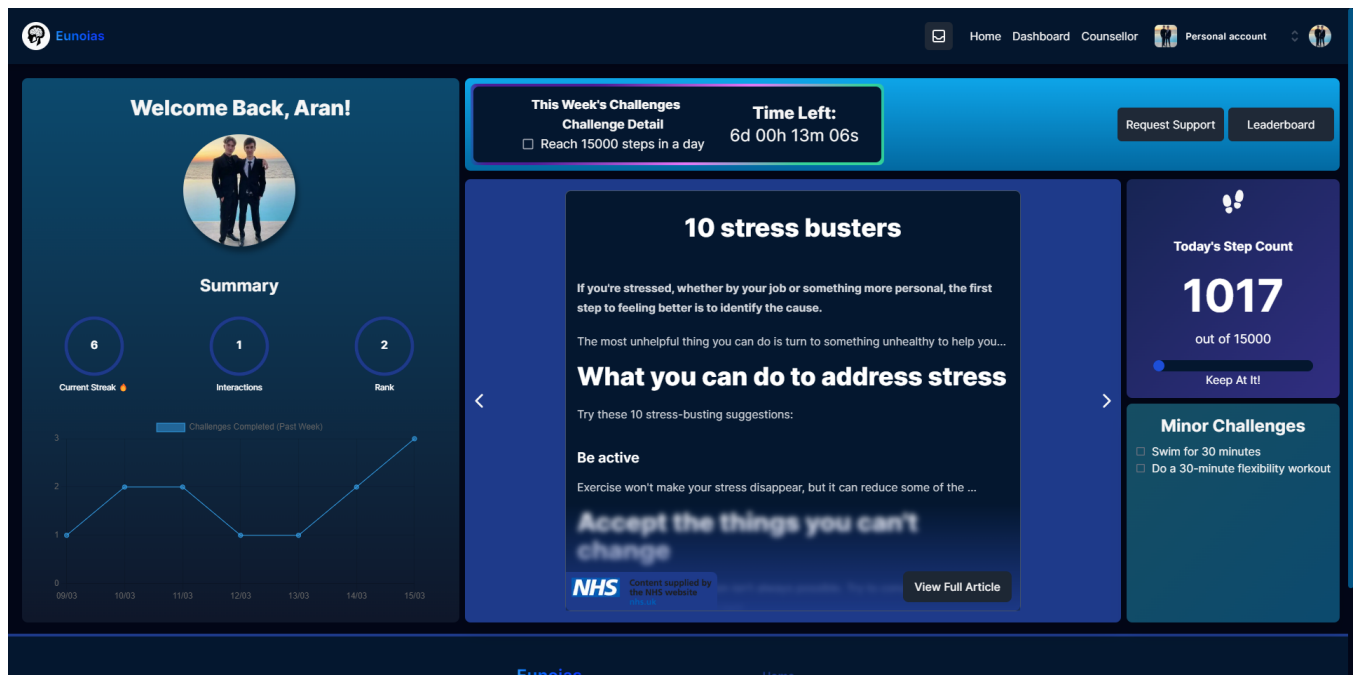


Figure 37: Final Colour Scheme

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