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Documentation: Project Introduction

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# INTRODUCTION TO THE PROJECT

Welcome!

This document pertains to all the application documentation for Team Quaternary’s XBCAD7319 project. In this document, high-level in-depth discussions will be provided around our applications requirements, our analysis of the applications domain, our implementation of the application, our data schemas, our architecture decisions, our security considerations, our devops plan, the estimated running costs of the application, and change management that will be involved in the project.

## 1.1. Client Organisation Background

Our client’s organisation, Crystal Ridge At Providence Stud, is a competitive equestrian center that was established in 1993, and is currently based in Benoni. Their aim as an organization is to always strive for the best, both for themselves and their horses, aiming to always provide and improve upon a “family” atmosphere. Crystal Ridge additionally offers outstanding 5-star facilities that are used to host frequent shows, such as their Equestrian Excellence Series.

They offer several different services, all at a high quality, which include:

* Stabling and Livery which entails providing top-notch around the clock care for your horses.
* Riding Lessons which entails highly qualified instructors providing horse riding lessons.
* Courses and clinics which entails sharing their knowledge and passion through courses and clinics.

For more information visit: <https://www.crystalridgestables.co.za/>

## 1.2. The Project’s Purpose

At Crystal Ridge, one section of their business model involves offering horse-riding lessons. Their current system in place is a time consuming and tedious process that involves manually capturing, booking, scheduling and organizing these horse-riding lessons. The purpose of this project is to create and deploy a lesson management application, tailored to the needs of our client’s equestrian estate, that aims to simplify, speed up and ease their processes of capturing, booking, scheduling and organizing their horse-riding lessons.

## 1.3. Ethical and Privacy Concerns

When researching about ethical and privacy concerns, OpenAI (2024) was able to indicate some very important concerns that need to be addressed. For each of these concerns indicated by OpenAI (2024), a description will be provided by OpenAI (2024) to describe the concern, and we will state how we the concern will be addressed.

The ethical concerns indicated by OpenAI (2024) include:

* Data Security

This involves ensuring that user data is securely stored and protected from unauthorized access or breaches (OpenAI, 2024).

Solution: Our database provider, Supabase, provides authentication and verification functionalities that will be utilized to ensure that only certain verified users can access the data within the database. Additionally, we will keep the API key provided by Supabase outside of the code, stored in an environment variable closer to the hosting platform to mitigate unauthorized database access if the code is breached.

* Transparency

This involves being transparent about how user data is collected, used, and shared within the application (OpenAI, 2024).

Solution: Firstly, on the login page, we will provide a hyperlink or access to terms and conditions page or document that outlines how the data will be collected, used, and shared. Secondly, the primary purpose of collecting personal information will be to ensure that a user is properly identified within the application. Therefore, minimal personal data will be collected as only the essentials information such as name, surname, email, and potentially phone number are necessary to properly identify the user within the application.

* Informed Consent

This involves obtaining explicit consent from users before collecting their personal data and ensuring they understand how it will be used (OpenAI, 2024).

Solution: Firstly, the terms and conditions provided will explain how and why their personal data will be collected and used. Secondly, users will have to request their account to be created by an admin which can only be done after agreeing to the terms and conditions.

* Data Ownership

This involves clarifying who owns the data collected by the application and how it can be accessed or deleted by users (OpenAI, 2024).

Solution: Firstly, the owner of the data and the processes of how to access the data and delete the data will be clarified in the terms and conditions. Secondly, all users will be managed by system admins, meaning that users will not be able to delete their account whenever they want to. Instead, they will have to request that it be deleted.

* Bias and Discrimination

This involves avoiding biases in algorithms or decision-making processes that could lead to discrimination against certain groups of users (OpenAI, 2024).

Solution: No algorithms or decision-making processes will be needed within the application as the purpose of the application is improve the manual process of organizing horse-riding lessons, resulting in no disclination and no bias as there will be no measure in place that is capable of discrimination and bias.

* User Empowerment

This involves providing users with control over their data, privacy settings, and the ability to opt-out of data collection if desired (OpenAI, 2024).

Solution: Firstly, all users will be managed by system admins, meaning that system admins will be the ones who control the user information within the system. Secondly, as users will not be interacting with one another over the application, therefore user data will private only to Crystal Ridge and the user themselves. Thirdly, the application will only require the essential user data to be able to identify who the user is, meaning that a user cannot opt out of data collection as data collection will only take place when creating an account and no-after.

* User Safety

This involves ensuring that the application does not facilitate harmful or unethical behaviours, such as cyberbullying or harassment (OpenAI, 2024).

Solution: The application will not contain or provide any functionality in which users can interact with each other, preventing harmful and unethical behaviours amongst users.

* Accessibility

This involves designing the application to be accessible to users with disabilities and ensuring inclusivity in its features and functionalities (OpenAI, 2024).

Solution: To ensure accessibility, screen reader support will be implemented for the visually impaired and website bandwidth and internet usage will be optimized for those with limited internet access.

* Environmental Impact

This involves considering the environmental impact of the application, such as energy consumption or carbon footprint, and implementing measures to reduce it (OpenAI, 2024).

Solution: As our application and its services will be hosted in the cloud, the environmental aspects will be transferred to and managed by the cloud services.

The privacy concerns indicated by OpenAI (2024) include:

* Data Collection

This involves limiting the collection of personal data to what is necessary for the functionality of the application and obtaining user consent for data processing (OpenAI, 2024).

Solution: The primary purpose of collecting personal information will be to ensure that a user is properly identified within the application. Therefore, minimal personal data will be collected as only the essentials information such as name, surname, email, and potentially phone number are necessary to properly identify the user within the application. The user will provide consent for the application using minimal personal information when creating an account.

* Data Minimization

This involves minimizing the amount of personal data collected and stored to reduce the risk of data breaches or misuse (OpenAI, 2024).

Solution: The primary purpose of collecting personal information will be to ensure that a user is properly identified within the application. Therefore, minimal personal data will be collected as only the essentials information such as name, surname, email, and potentially phone number are necessary to properly identify the user within the application.

* Data Protection

This involves implementing strong encryption and security measures to protect user data from unauthorized access or theft (OpenAI, 2024).

Solution: The cloud hosting services used automatically provides encryption methodologies that will ensure that data will be secured both inside and outside of transit.

* Third-party Sharing

This involves clearly stating if and how user data is shared with third parties, such as advertisers or analytics providers, and obtaining user consent for such sharing (OpenAI, 2024).

Solution: Firstly, the data captured in the application will be useful and relevant only to the application and Crystal Ridge itself, with no intention of ever being sold or shared with third parties. Secondly, the data captured in the application will have no use for advertisers or analytics as the information pertains to horse-riding lessons and horse-riding lessons alone.

* User Anonymity

This involves providing options for users to use the application anonymously or pseudonymously to protect their privacy (OpenAI, 2024).

Solution: Firstly, as this is more so of a service application, anonymous use may potentially cause some security concerns, hence there will be no option for anonymous use. Secondly, users won’t be interacting with other users on the application, meaning that not being anonymous won’t have as big of implications.

* Data Retention

This involves establishing clear policies on how long user data will be retained and when it will be deleted (OpenAI, 2024).

Solution: Firstly, these policies will be determined purely by the client. Secondly, these policies will be discussed in the terms and conditions.

* User Rights

This involves respecting user rights regarding data access, rectification, erasure, and portability as mandated by data protection regulations (OpenAI, 2024).

Solution: To ensure that the rights of users will be respected, data protection regulations such as POPI and GDPR will be used.

* Geolocation Data

This involves handling geolocation data responsibly and ensuring that users have control over when and how their location information is shared (OpenAI, 2024).

Solution: The application will in no sense of the matter use geolocation data as it will not be necessary.

* Children's Privacy

This involves complying with regulations such as COPPA (Children's Online Privacy Protection Act) when collecting data from children under 13 years old (OpenAI, 2024).

Solution: Firstly, the application doesn’t collect data from users, apart from the basic information such as name, surname, email, and potentially a phone number. Secondly, the application will mostly consist of adults as they will be the ones to arrange and pay for horse-riding lessons for themselves or their children.

## 1.4. Work Agreement

Our goal as a team is ensure that at the very least, the application meets our DoR (see 1.2. Definition of Ready (DoR)) by the end of the working period / semester. As the team is also occupied with other projects, the application may not meet our DoD (see 1.3. Definition of Done (DoD)) due to the time constraints. As a result, any work needed to get the application to meet our DoD will be completed after the working period / semester, with the same working conditions and being free of charge.

The following denotes the team members and their responsibilities:

* Damian Dare: “The Sheriff”

Damian is the sheriff of these parts, maintaining peace and order whilst ensuring the law is upheld. In layman’s terms, Damian’s responsibility pertains to that of the team leader and quality assurance, ensuring the team does what they are supposed to do, ensuring the completed work is of high quality, combining the work together into one cohesive unit, and assisting wherever help is needed.

* Guillaume Swanevelder: “The Third Leg”

Guillaume provides the team with an additional support mechanism, ensuring balance and stability, keeping the team afloat when the waters become unstable. In layman’s terms, Guillaume’s responsibility is to provide the team with an extra hand to assist in any task, enabling the team to complete tasks faster or to better juggle different tasks and projects.

* Christiaan Versfeld: “The Exorcist”

Christiaan expels all of the demons from our code, allowing it to work as intended. In layman’s terms, Christiaan’s responsibility pertains the backend of the application, designing, testing, and ensuring that all system functionality works correctly.

* Ruan Zwarts: “The Beauty Queen”

Ruan is the prettiest princess of them all, using his skills to make our application look as good as he does. In layman’s terms, Ruan’s responsibility pertains the frontend of the application, designing, testing, and ensuring that the applications user-interface is friendly, consistent, colorful, and responsive.

## 1.5. Definition of Ready (DoR)

Our DoR is when:

* The “basic” requirements have been implemented (see 2. REQUIREMENTS).
* The non-functional requirements have been implemented (see 3. NON-FUNCTIONAL REQUIREMENTS).
* The analysis artifacts have been implemented (see 4. ANALYSIS ARTIFACTS).
* The implementation documentation has been implemented (see 5. IMPLEMENTATION DOCUMENTATION).
* The data schema documentation has been implemented (see 6. DATA SCHEMA DOCUMENTATION).
* The architecture artifacts have been implemented (see 7. ARCHITECTURE ARTIFACTS).
* Security has been implemented (see 7. SECURITY).
* DevOps has been implemented (see 9. DEVOPS).

## 1.6. Definition of Done (DoD)

Our DoD is when the functionality of our “ready” application (see 1.2. Definition of Ready (DoR)) has been extended to include our “extra” requirements (see 2. REQUIREMENTS).

## 1.7. Roadmap (High-level plan)

The high-level plan for the team is as follows.

Basic documentation will be completed by the 27th of September to provide a foundation in which the application can be built. This documentation will then be used to build the project’s application that satisfies the Definition of Ready (see 1.1. Work Agreement and 1.2. Definition of Ready (DOR)), which will be completed by 25th of October. Following the completion of DoR application, the remaining documentation will be completed by the 22nd of November. The documentation will also possibly be expanded to meet the DoD (see 1.3. Definition of Done (DoD)) if there is enough time.

During these working periods, there will be at a minimum, one recorded meeting per week discussing what we did the previous week, what we plan to do for upcoming week, and what have been some of the troubles we have encountered. These recorded meetings will be used as artifacts to prove that we are working and communicating frequently. Additionally, although there may only be one recorded meeting per week, team members may meet privately to discuss certain matters. These “private” meetings won’t be recorded however a screenshot will be taken to prove that a meeting took place.

This roadmap / plan will be most optimal for the team as the meetings won’t consume that much time per week, while spreading out the work, allowing the team to complete the assigned work before its deadline.

## 1.8. Project Risks and Mitigation Strategies

The following risks to the project were indicated by OpenAI (2024) and pose the most likely threat of occurring.

* Time Constraints

As the team is busy working on several projects from other modules, there may not be enough time to produce a high-quality product that the customer is satisfied with.

Mitigation Strategy: Extensive planning and communication will be conducted to ensure that the team is able to balance the semester’s workload, enabling high-quality work to be produced.

* Third Party Vendors

The application being produced will not be self-hosted but will rather be hosted on third party services such as Vercel and Supabase, meaning that if any of the services were to shut down or to suffer from performance issues, the same would apply to the application. Additionally, it is possible that there may be some form of contractual issues that arise when using third party solutions, causing the client to be locked into a contract that they no longer want to be in or being kicked out of a contract that they want to be in.

Mitigation Strategy: In terms of the contractual side of things, the third-party services that will be used to host the application and its data will have a monthly payment option, allowing you to opt in or out on a per month basis. Additionally, a contract may only be required from these vendors if the application greatly exceeds expectations and requires a custom resource plan from the vendors, which may not be necessary as the vendors’ “pro” tiers may be sufficient for this application. In terms of the services shutting down, the data will be regularly backed up and the code will be in an easily reachable place, allowing for easy migration to occur if the need arises.

* Security

As the team consists of students, we may not have enough knowledge, expertise and experience to be able to fully secure the application we are building.

Mitigation Strategy: We will use external trusted tools to test and secure the application to the best of our ability while conducting extensive research into how we will be able to secure the code. Additionally, we will thoroughly suggest to our client to find someone that can test the applications security and provide solutions that will better secure the application.

* Regulatory Compliance

As the team consists of students, studying IT and not Law, we may not have enough knowledge, expertise and experience to be able to fully ensure that the application complies with legal requirements, industry standards, and data protection methods.

Mitigation Strategy: We will conduct extensive research into how we will be able to comply with regulatory standards. Additionally, we will thoroughly suggest to our client to find someone that will ensure that the application complies with regulatory standards.

# REFERENCE LIST

OpenAI. 2024. Chat-GPT (Version 3.5 - Turbo). [Large language model]. Available at: https://poe.com/ [Accessed: 25 September 2024].