Virtual Book Club : Project Analysis:

(Collaborators)

Nadeem Mohammed, Vivash Singh, and Azaria N. Alli

TABLE OF CONTENTS :

1

Purpose: our problem and objectives

The purpose of this system is to provide an innovative solution to the changing landscape of software and book reading in the digital age. It is designed to provide convenience and a new revenue stream for bookstores. Customers can pay a monthly fee to participate in the book club and access its current read. They can also browse and vote on future reads, as well as purchase books for their personal collection. To begin designing and implementing this project, we will start with the Richfield's campus Book Club.

Objectives

1. Information Sharing: This web site should serve as a repository of information about the book club, including its goals, upcoming events, and reading lists. It should provide details on how to join the club and participate in its activities.

2. Event Management: This web site should allow members to view and RSVP for club meetings, author talks, book launches, and other book-related events. It should provide event calendars, reminders, and notifications to keep members informed about upcoming gatherings.

3. Book Discussions: This web site should provide a platform for members to engage in online discussions about the books they are reading. This can include a chat room and a voting system where members can share their thoughts, ask questions, and exchange recommendations and make decisions of what books should be discussed.

5. Member Profiles/usernames: This web site can allow members to create profiles by personalizing it with unique profile pictures and usernames. This can help members connect with like-minded individuals and foster a sense of community within the club.

8. Accessibility: This web site should be designed to be accessible to all members, taking into consideration factors such as responsive design for different devices, compatibility with assistive technologies, and adherence to web accessibility standards.

1.1

Purpose: our problem and objectives

(continued...)

9. Social Media Integration: The web page can integrate with social media platforms, allowing members to share club activities, book recommendations, and discussions on their personal social media accounts. This can help promote the club and attract new members.

By achieving these objectives, the web page for the book club will enhance communication, engagement, and collaboration among club members, creating an inclusive and vibrant community of book lovers on campus.

1.2

Users Of the System:

USER 1	Richfield Staff/Project facilitators	• Home page • Index page • Login • Admin • Update credential • Main page • Community chat page • Database
USER 2	Students Customers	• Home page • Login • Update credential • Main page • Community chat page
USER 3	Club President Store manager	• Home page • Index page • Login • Admin • Update credential • Main page • Community chat page

2

Project summary

oday, we present an innovative software solution that enables bookstores to offer their customers a digital book club experience. Customers can participate in book discussions, vote on their next read, and browse a variety of online books provided by the bookstore. This idea was inspired by the Richfield Umhlanga Book Club, which relied solely on WhatsApp for communication and sharing of books. We decided to create a responsive and engaging website to improve the user experience for students at campus to have a system just for Online Books and Online textbooks whilst allowing accessibility and an interactive way of sharing of ideas with our on-campus Book Club and an extension to on-going campus material furthering our ability to bring a connection from students to lectures.

The Richfield Book Club is an exclusive online platform designed to foster a vibrant community of literature enthusiasts among Richfield students. This secure platform allows authorized students to share their passion for books by uploading and downloading PDFs, engaging in insightful discussions through comments, and connecting with fellow bookworms through a lively community chat.

To ensure a secure and exclusive environment, membership is restricted to Richfield students. Only the Book Club President and authorized developers can grant membership access using students' unique student numbers. Upon receiving membership approval, students can log in using their student number and the default password, **R1chField@2023**. For enhanced security, students are prompted to change their password upon initial login.

The Richfield Book Club is committed to providing a safe, *Summary of Pages*tellectually stimulating space for students to explore the world of literature, connect with fellow book enthusiasts, and expand their literary horizons.

This website will have a Home Page (Index.php), Login Page (login.php), Update Credentials (UpdateCredentials.php), community chat page (community.php) and a admin page (admin.php). There will be a separate php file for the database connection with myphpadmin.

Summary of Pages

Index.php

The Richfield Book Club's main page serves as a dynamic hub for students to engage with the literary world. This fully responsive design seamlessly adapts to various devices, ensuring a seamless user experience. The page features two distinct sections: Current Reads and Recommended Reads.

The Current Reads section showcases the book currently being discussed by the club, providing a central point for focused discussions. The Book Club President has the authority to set a start and finish date for each current read, ensuring a structured and organized reading schedule. An update button allows the President to effortlessly transition to the next book selection.

The Recommended Reads section serves as a treasure trove of literary gems, where students can explore a diverse collection of books uploaded by fellow members. This section encourages active participation, allowing students to comment on books and vote for their preferred next read. This democratic approach ensures that the club's reading selections reflect the collective interests of its members.

The main page, with its intuitive design and interactive features, fosters a vibrant and engaging community for Richfield students to connect over their shared love of literature.

The main page, with its intuitive design and interactive features, fosters a vibrant and engaging community for Richfield students to connect over their shared love of literature.

Summary of Pages (continued...)

Community.php

The Richfield Online Book Club's interactive platform fosters engaging discussions among students. Logged-in participants can seamlessly connect and exchange ideas in a unified group chat environment, fostering a vibrant community of literary enthusiasts.

Admin.php

Exclusive access to this administrative page is granted to authorized personnel, including developers and the book club president. This centralized hub empowers the designated individuals to manage student participation in the book club by adding or removing members directly within the club's database. Additionally, the president can utilize this page to update the current reading selection, either by selecting the most popular choice among members or by uploading a book of their choosing.
The president will also be able to set the time limit for the current read that will be display on the idex.php page below the current read.

Login.php

Serving as a gateway for registered students, the main login page streamlines access to the Richfield Online Book Club. Upon entering their student number and the default password **(R1chField@2023)**. To ensure a secure and organized environment, the club president must first add students through the administrator page, granting them authorized access. Following a successful login and completion of the student number authorization step, students will be seamlessly redirected to the UpdateCredentials.php page.

UpdateCredentials.php

This page only be available to student numbers that have been recognized by the database. They will be asked to change their password and create a username. Once done the php script will update the database accordingly.

System Security

To facilitate the security of the system, various security protocols will be followed and implemented in the design of the system.

User authentication and authorization

- Students will have to physically apply to join the book club by asking the campus manager or the book club president to update the book club's database and add their student number to successfully log into the website and update their password for logging in. This will ensure that an unauthorized user cannot log in since their student number will not exist in the database.
- PHP sessions will be used on every page to verify an existing student number is in session, if the session is empty or the sessions student number does not exist in the database, the user will be redirected to the login page.
- Students will be required to use strong passwords when redirected to the update-credentials page, any password that does not meet the security requirements will not be accepted.
- Implement role-based access control (RBAC) to restrict access to certain features of the website to certain users. For example, only the book club president should be able to add or remove students and choose the next book for everyone to read.

Data security

- Encrypt all sensitive data, such as user passwords, book PDFs, and chat messages.
- Store all data in a secure database (Google Firebase – Real-time Database).
- Implement regular backups of the database (Google Firebase – Real-time Database).
- Test your website for security vulnerabilities on a regular basis.

Content Moderation

- Implement a content moderation system to prevent users from uploading or posting inappropriate content. When a Book is uploaded by a user, the campus president will have to review the upload and verify it is safe for website distribution.
- Allow users to report inappropriate content to the website administrators.
- Monitor the website for inappropriate content and take action to remove it promptly.

Website Security

- The use of a Secure sockets layer SSL certificate provided from our web hosting platform (Google Firebase) will ensure that the data in transit is secure and not subject to any attacks.
- Website files and data will be stored on Googles cloud database ensuring encryption techniques and privacy of user data.

User Account Security

- Allow users to report suspicious activity.

- Implement a lockout policy to prevent brute-force login attempts.

- Use a password manager to generate and store strong, unique passwords for all user accounts.

File Uploads and Download

- Only allow users to upload and download PDF files.
- Scan all uploaded files for malware and viruses (use of an API)
- Quarantine or delete infected files.
- Set a limit on the size of uploaded files.
- Implement a download rate limit to prevent users from downloading too many files at once.

Community Chat

- Implement a profanity filter to block inappropriate language.
- Allow users to report abusive or inappropriate messages.
- Implement a moderation system to review and remove reported messages.
- Log all chat activity into a separate table in the database for auditing purposes.

Admin Page

- Only allow the book club president to access the admin page.
- Implement a strong password for the admin account.
- Use a separate password manager for the admin account.
- Log all admin activity for auditing purposes.

General Security

- The use of a web application firewall (WAF) to protect the website from common attacks.
- Keep the website software up to date with the latest security patches.
- Implement a content security policy (CSP) to restrict the types of scripts and styles that can be loaded on the website.
- Use a secure hosting provider that offers regular backups and security monitoring (Google Firebase).

4

Web Application

This web application is managed under HTML, PHP, JAVASCRIPT, and MYPHPADMIN database for demonstration of its functionality.

Responsibilities

The web application must provide a continuous, interactive and dynamic experience to the user, allowing access to all the information that the user requests and facilitating any task that the user wants to perform over the system. It must provide comprehensive error messages whenever one happens.

Features

The website has a front-end framework which will allow an SQL model to run behind the scenes. The dashboard will allow users to see books that have selected and uploaded, this will also allow the user to vote their preference of book for that week which will be read and discussed according to the club president. Users that try to login without being registered will have the correct error be shown. When a request is made and fails, it's retried multiple times and finally a popup is shown asking to retry before continuing.

USAGE

The code runs within the browser when the page is loaded. However, it's desirable to pack the code in a single file when the version is about to go to the testing server, so that a single request to download the whole file is made.

Richfield Book Club

System Design: Architecture &Structure

User Interface and Navigation:

We have designed an intuitive and user-friendly interface that allows users to easily navigate and access different features of the website. This includes a clear and visually appealing layout with appropriate menus, buttons, and search functionalities. This will ensure that the website is responsive and compatible with different devices, such as desktops, tablets, and mobile phones.

Here is a few renderings of our initial design :

Login.php:

The login page described features a default password that, if entered correctly, grants access to a new page called "Update Credentials ." However, if the default password is not entered instead a pre-defined password is entered, the user is redirected to the main page.

The login page itself typically consists of the following elements:

1. Student number Field: A text input field where the user can enter their student number.

2. Password Field: A password input field where the user can enter their password. In this case, there is a specific default password(**R1chField@2023**) that grants access to the "Update Credentials" page.

3. Login Button: A button that initiates the login process when clicked. Upon clicking, the system verifies the entered student number and password.

Depending on the user's input, the following scenarios can occur:

- *Scenario 1:* Correct Default Password Entered:
  - If the entered student number is valid and the default password is entered   correctly, the user is granted access to the "Update credential" page.
  - The system validates the credentials and redirects the user to the "Update credential " page, where they can perform actions such as updating their their password and new username.

- *Scenario 2:* Incorrect Default Password Entered:
  - If the entered student number is valid but the default password is not entered correctly, the system denies access to the whole website.

UpdateCredentials.php :

The update credential page includes fields for a new password, confirmation of the new password, and a new username field. Users can modify their password and username on this page. Here's a description of the update page:

1. New Password Field: A password input field where the user can enter a new password. The password field typically obscures the characters for security purposes.

2. Confirm Password Field: Another password input field where the user must re-enter the new password to ensure accuracy and prevent typing errors.

3. New Username Field: A text input field where the user can enter a new username that will be used in the rest of the website.

4. Update Button: A button that initiates the update process when clicked. Upon clicking, the system verifies the entered information and applies the changes if they meet the specified requirements.

The following scenarios may occur after clicking the update button:

- *Scenario 1:* Password and Username Successfully Updated:
  - If the new password and the confirmed password match and satisfy any specified criteria (e.g., minimum length, complexity requirements), and the new username, if provided, is valid, the system updates the user's password and/or username accordingly.
  - A success message may be displayed, informing the user that their password and/or username has been successfully updated.
- *Scenario 2:* Password and/or Username Update Failures:
  - If the new password and the confirmed password do not match, or if the new password does not meet the specified criteria, an error message is displayed, prompting the user to correct the password fields.
  - Similarly, if the new username is invalid or conflicts with existing usernames, an error message is displayed, prompting the user to choose a different username.

Next page is an image rendering>>

UpdateCredentials.php (Image rendering):

Admin.php:

The admin page is a restricted access page that allows only specific users, such as the club president and Richfield staff, to access its features. It provides administrative functionalities for managing students, books, and the voting process for book selection. Here's a description of the admin page:

1. *Access Control:*
   - The admin page is accessible only to authorized users, such as the club president and Richfield staff. It typically requires authentication through a secure login process to ensure that only privileged individuals can access its features.

2. *Student Management:*
   - The admin page provides a section where new students can be added to the club.
   - It includes fields to enter relevant student information such as their student ID.
   - Upon submission, the system validates the data and adds the student to the club's membership list.

3. *Book Management:*
   - The admin page offers a feature to add new books to the club's collection.
   - It includes fields to enter book details, such as title, author, genre, and path.
   - The system validates the entered information and adds the book to the club's book catalog.
   - Additionally, the admin page may allow for editing or removing existing books from the catalog.

4. *Role-Based Access:*
   - The admin page applies role-based access control, ensuring that only authorized users with specific roles, such as the club president and Richfield staff, can perform administrative tasks.
   - User authentication and authorization mechanisms are implemented to verify the user's role and permissions before granting access to the admin page.

Admin.php(Image rendering):

Index.php :

The main page, accessible after the login process, serves as the central hub for the book club website. It displays all books in a grid format, provides checkboxes for voting, and features weekly announcements regarding the book to be discussed and read. Here's a description of the main page:

1. *Book Grid:*
   - The main page presents a grid layout showcasing all the available books in the club's collection.
   - Each book is displayed with its title, author, genre, and possibly an associated image or cover.
   - The grid format allows for easy browsing and visual exploration of the books.
2. *Voting Checkboxes:*
   - Next to each book entry in the grid, there is a checkbox that allows logged-in members to vote for their preferred books.
   - Members can select one or multiple checkboxes to indicate their choices for the next book to be discussed and read.
   - The system stores and tracks the votes, which will be considered in the book selection process.
3. *Weekly Announcements:*
   - The main page prominently displays weekly announcements regarding the book that will be discussed and read during a particular week.
   - These announcements may include details about the selected book, the discussion schedule, and any associated events or activities.
   - Members can easily find the information they need to prepare for the week's book-related activities.
4. *Login Access:*
   - The main page can be accessed only after successfully logging into the book club website.
   - Users who have not logged in will be redirected to the login page to authenticate their credentials before gaining access to the main page's contents.
5. *Navigation and Additional Features:*
   - The main page may include a navigation menu or sidebar that allows users to access other sections of the website, such as the community chat.
   - Additional features, such as search functionality or filtering options, may be provided to help users find specific books or explore based on their preferences (Still in development).

Index.php (Image rendering):
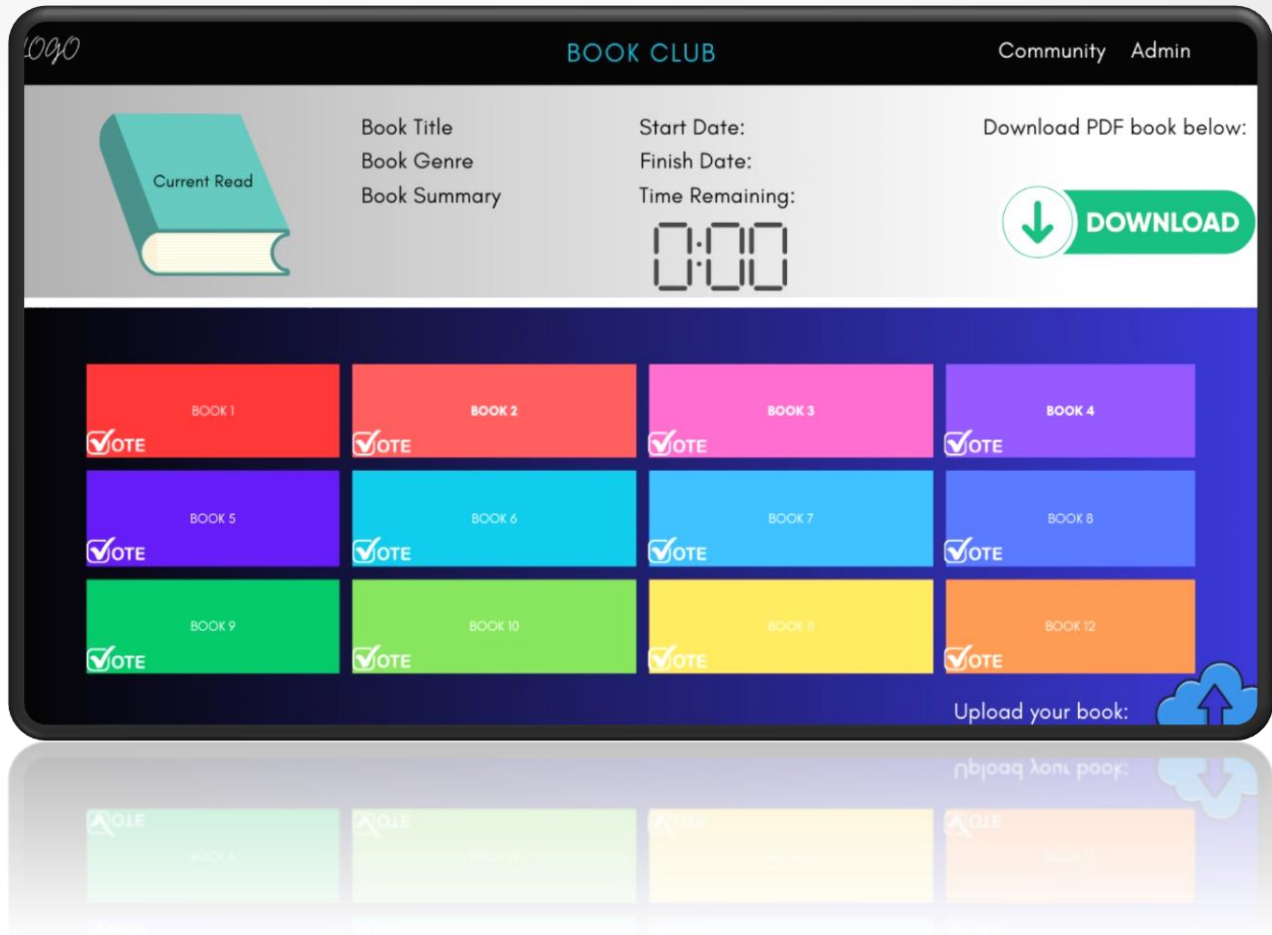
Community.php :

The community chat page interface will be similar to WhatsApp group chat, where users can communicate with each other in real-time. The chat page also displays user usernames and profile pictures, which are collected on this page.

1. Chat Interface:
- The community chat page provides a user-friendly interface that resembles popular messaging platforms like WhatsApp.
- The chat interface typically includes a chat window where users can view and participate in ongoing conversations.
- Messages are displayed in chronological order, with timestamps indicating when each message was sent.

2. Usernames and Profile Pictures:.
- The usernames are displayed alongside the messages sent by each user, allowing others to identify the sender.
- Profile pictures, chosen by users on the chat page, are displayed next to the usernames to provide visual representation.

3. Real-Time Communication:
- The chat page enables real-time communication, allowing users to send and receive messages instantly.
- Messages are usually displayed in real-time, appearing in the chat window as soon as they are sent by users.
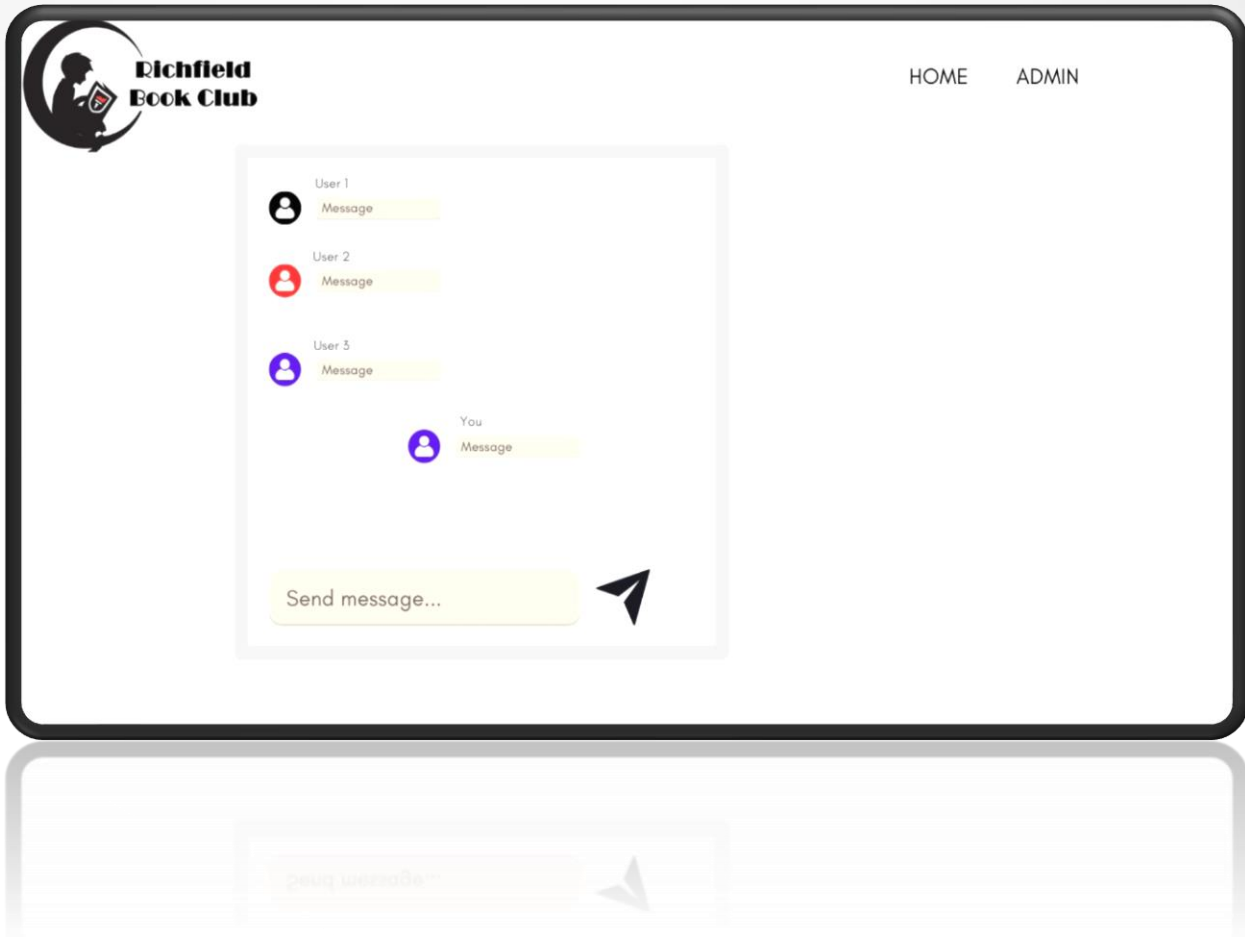
4. Privacy and Security:
- The community chat page should prioritize user privacy and security.
- User information, such as usernames and profile pictures, will be stored securely and protected.

Community.php (Image rendering):

5

Richfield Book Club

Development: What has been done

1. Implementing the Design and Requirements:

The development process has led us to divide the work with our 3 Developers/designers which has allowed us to move forward to an almost complete project. Here below is the names of collaborators and some of the responsibilities each were assigned.

SOFTWARE DEVELOPERS:

Name/s
Software developers (Nadeem Mohammed, Vivash Singh and Azaria Alli)

Description
We have done the front end and back-end coding for specific pages in this project.

Responsibilities
Write code compliant with the requirements specified by the problem at hand.

Concerns
Security, platforms, architecture, database, and authorisation.

PROJECT MANAGER (TEAM LEADER):

Name
Project Manager (Nadeem Mohammed)

Description
He handled information sent from customer to developers and other members in the team, has also coded and designed *Admin.php* with *Vivash Singh.* As well as designed and developed the *Index.php* and *Upload.php* pages and handled the back-end and front development for the respected page.

Responsibilities
Ensures all requirements are met and send feedback to the team and client

Concerns
Ensuring the project comes out on time and is finalized to the intial specifications.

FRONT END DEVELOMENT/DEVELOPER:

Name
Presentation/Power Point/Design (Vivash Singh)
Description
He handled the design and presentation power point for this project and assisted with designing the pages as well has designed the logo of *RICHFIELD BOOK CLUB PROJECT.* He also assisted in creating the *Admin page* with our Project manager *Nadeem Mohammed.*
Responsibilities
His responsibilities were to ensure that all presentations where done in time and was approved by all collaborators on the project.
Concerns
Ensuring the project comes out on time and is finalized to the intial specifications.

DATABASE/PROJECT ADMINISTRATOR :

Name
Back-end Developer/Database Administrator/Documentation(Azaria Alli)
Description
She handled the development of the *Login* and *Update Credential pages* with the back- end development with designing these specific pages . While also handling these pages, she designed and facilitated the database structure, relationships, and design of the database. She has also handled the documentation and part of the presentation regrading this document and as well as editing and formatting this document with all information specific to this project .
Responsibilities
Her responsibilities were ensuring the project comes out on time and the database is running correctly to intended design, as well as updating and maintaining the database throughout the project process.
Concerns
Ensuring the project comes out on time and the database is running correctly to intended design.

3ʳᵈ PARTY SOFTWARE :

Web hosting services	**Google Firebase**
Database Services	**Google Firebase / phpMyAdmin**
Workflow management	**GitHub**

SYSTEM THEME :

1	2	3	4	5
00A6FB	0582CA	006494	003554	051923

HEX INDEX	
1	00A6FB
2	0582CA
3	006494
4	003554
5	051923

FONTS :

- Using css normalization stylesheet: normalize.css

```css
html {
    /* Improve consistency of default fonts in all browsers.
    font-family:
        system-ui,
        'Segoe UI',
        Roboto,
        Helvetica,
        Arial,
        sans-serif,
        'Apple Color Emoji',
        'Segoe UI Emoji';
    line-height: 1.15; /* 1. Correct the line height in all browsers. */
    -webkit-text-size-adjust: 100%; /* 2. Prevent adjustments of font size after
orientation changes in iOS. */
    -moz-tab-size: 4; /* 3. Use a more readable tab size (opinionated). */
    tab-size: 4; /* 3 */
}
```

WORKFLOW MANAGEMENT :

This was done through GITHUB, as a way to send code on a shared platform that allowed easy access to all code, documentation, media etc. This allowed us to work remotely in separate places while still having an update of each one's progress. GITHUB as also helped us to safely keep this project secured and private while project development was taking place.

6

Database: Structure and Relationships

Database called 'book_club':

- There will be five tables in the database (All fields and tables are in small caps):
  1. Login
  2. Community chat
  3. Voting_books
  4. books
  5. Student_number (from richfield, and for now we can just make our own for demonstration)

- **Login Table:*This table must be created first***

Fields	Description
Login	*Primary key :*Auto incrementation, keep track of login details
Student_number	*Foreign key:* (from Richfield databases allowing only Richfield students can use this web application) * However for now will enter that manually to test.
username	Allows a user to enter and checks for any replication.
password	*Default (R1chField@2023) specified when creating the table;* Must have 5 or more characters, 1 capital letter from the 5 or more characters, 1 special character(@,#,$,*,%) and 4 numbers.

- **Community_Chat:**

Fields	Description
Chat_id	*Primary key :* Auto incrementation, keep track the number of chats entered
Login_id	*Foreign key :* Links the tables and allows it be saved to each users names.
time	Saves the time the message was entered
chat	Saves the message entered by the user. (Can have more than one to each user)
Profile_pic	Allows the user to insert a profile picture for chatting.

- **Voting_books :**

Fields	Description
Voting_id	*Primary key :* Auto incrementation, keep track of voting details.
times_voted	Saves how many times where voted by adding 1.
Login_id	Links the tables and allows it be saved to each users names.

- **books:**

Fields	Description
book_id	*Primary key :* Auto incrementation, keep track of books entered.
name_book	Saves the name of the book.
author_book	Saves the authors name.
Book_path	Where the book is from

7

Testing and Debugging:

- Throughout the development process, thorough testing and debugging was done to ensure that the developed components work as intended.
- Various testing techniques, such as integration testing, and user acceptance testing (*Still in process*), responsive testing for all devices these methods were employed to identify and fix any issues or bugs.
- The development team/ collaborators validated the functionality, usability, and performance of the website.
- However few errors were met such as copy rights and if deployment was allowed due to carrying a name that has copyright to it's name.
- Therefore we have a draft/final of this project that describes what our end goal for this project will be.

Therefore, for testing and debugging purposes we have tested on different devices for responsiveness, uploading and receiving from the database as well as adding new data to the respected tables with information from specific pages.

8

Development Progress and Finalization:

Finalization Phase:

In this part of the project, we will ask out sources/our audience (RICHFIELD CAMPUS) to allow to deploy and allow for students to test our application for its usefulness, flow, design and functionality, this can allow us to see if this project will benefit the students of RICHFIELD and allow us to determine our project timeline.

This can also give students an opportunity to give feedback to allow to make appropriate changes to benefit the students and over all user friendliness. However, this can only take place with permission from the campus and higher facilitators such as the people we are presenting to.

Deployment Readiness:

We have created below a checklist of what we have done so far to indicate the project's readiness:

√Logo Discussion
√Communication throughout the project(Whatsapp, GITHUB, Email)
√Time for possible testing/deployment
√Time for possible draft finalization
√Allocating time/pages to collaborators
√Presentation finalization/approval
√Testing Database live(STILL IN PROGRESS)
√Finishing design and functionality(STILL IN PROGRESS)

*Please note this is an idea rendering and a way to showcase our idea/s