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Initial Plan - MyBookChoice

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MODULE TITLE – **INDIVIDUAL PROJECT**

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MyBookChoice: A Literary Recommender

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Project Description

With the current isolation of the COVID-19 pandemic, reading has again become a needed release for many people across the globe. Reading has been shown to provide psychological benefits, such as reducing social isolation, increasing personal confidence, and improving powers of concentration (Billington, 2012).

The purpose of this project is to create a web application where people can get recommendations for what book to pick up next. This will be achieved through a series of different recommendation algorithms, which use data gathered from intuitive interfaces, telling the application about a user's reading habits, preferred authors, genres, etc. This data can constantly be refined by user interaction with the application, creating a better and better picture of them and their preferences.

There is a gap in the current market for a user-friendly, accessible, and intelligent solution for recommending books to read based on a user's previously read books, and other preferences. I intend to create an easy-to-use, aesthetically pleasing, and intuitive system, based on a design model of so-called "Swiper" apps such as Tinder, because of its user-retention, and aesthetic possibilities. In fact, in a study conducted in 2018, "Entertainment" was the most common reason for using Tinder, followed closely by "Curiosity" (Timmermans, et al., 2018), which are both created by the addictive design of the applications binary format.

Ethics

This project will require a certain amount of human participation, namely during the usability testing section, scheduled for 22/02/2021, continuing until 26/02/2021. This will be used to gather feedback on the user interface usability, and collect two main datapoints:

1. The time taken to complete the tasks which satisfy a predetermined use-case.
2. A 10-question Likert score survey on the design of the application.

To collect this data, I will need to create participant information sheets, consent forms, as well as debriefing sheets. This will also require approval for the COMSC Research Ethics Group.

Aims & Objectives

MyBookChoice can be described through a key set of aims and objectives, both core and secondary, which when finished, will provide a working system.

Core Aims & Objectives

Core objectives are essential to the success of the project. They involve integral systems which are needed for the application to be accessed and used effectively.

1. Design a user-friendly front-end, adhering to the widely-used "Laws of UX" (Yablonski, 2021)
    a. The front-end will be what is interacted with by the users of the application, which pulls data from the back-end API.
2. Create a back-end API
    a. The API will be where the data is dealt with. For example, when a user creates an account, the API will receive the user's details, create a new user in the database, and generate a login token for the user.
3. Design and Implement a Database

    a. The database will be a key part of the system as it is what will store user details, as well as other mission critical data such as a user's reading preferences and settings.
4. Setup an Apache Virtual Host on my web server to allow people to access the site via a production deployment
    a. To allow users to access the site, Apache is needed to serve the application to them. This will be done via a virtual host because there are already some applications running on the server.
5. Create Recommendations Based on a User's Preferences
    a. The recommendation engine is the backbone of the whole system. Without it, there is no use for the website. This will be achieved using a Hybrid Recommendation engine, which will aim to provide high-quality recommendations to users.
6. Ensure users can refine their recommendations via a "Swiper" UI system
    a. Users need to be able to refine their reading 'profile' to enable better recommendations. This will be achieved via the 'Tinder-esque' interface, which suggests books to the user, learning their preferences.

Desirable Aims & Objectives

Desirable aims and objectives are items which are not essential to the core mission of the project but would greatly enhance and improve the project.

1. The application should have good SEO (Search Engine Optimisation), so users can find the site quicker using conventional search engines.
    a. SEO is important for any application, it decides how the site is indexed by search engines, and how high up the order of sites it is in a search listing.
2. The application should be compatible with a range of web browsers which make up over 80% of the market share.
    a. Broad browser support is important as it allows for an accessible web solution, which can be used on a range of devices.
3. The application should include cookie warnings, a privacy policy, and a terms and conditions page.
    a. Although the EU's GDPR no longer applies in the UK, the data protection laws in the UK have incorporated some of its key features. Therefore, protection of user information, informing the user how their data will be used, as well as cookie warnings are very important.

Justification of Technologies & Methodologies

1. Client-Server Separation
    a. Separating the application into a back-end API and a front-end MVC allows for a more modular program, which can be used to build other variants of the application, such as a native mobile app. It abstracts data modification/manipulation to the server, while all client-side processing and functionality is confined to its own application.
2. Agile Software Development Lifecycle
    a. I have decided to develop the application using the Agile methodology, for a couple of reasons. The first of these being that Agile allows for flexible design, development, testing, and repairing. Another key reason is due to the modular nature of the program structure, where one part (e.g., the client) relies on another (e.g., the API).

3. React Front-End User Interfaces
    a. To create the front-end, I intend to use React JavaScript framework to create all user interfaces in the application.
    b. To connect to the back-end, Redux will be used to manage global state in the application, allowing for secure and efficient data transfers to and from the back-end.
4. NodeJS Back-End API
    a. This will be written in NodeJS using the Express framework, which allows for a robust, and modular back-end server
5. MongoDB Data Storage
    a. MongoDB will be used to store user information, which will be used in recommendations, as well as, for logins, and profile information, as well as user reactions to books.
    b. MongoDB is known to be very flexible as it is a schema-less database, which easily allows for data to be omitted, which adds a layer of error prevention to data insertion.
6. Apache Virtual Host
    a. Apache virtual hosts are used when there are multiple websites being served from one Apache server instance. The server on which I intend to deploy this application has several sites already running on it, so a virtual host is required.
    b. Apache is a highly regarded and widely-used web server, which still makes up 34.9% of the web server market (Usage Statistics and Market Share of Web Servers, January 2021, 2021).

Risks & Challenges

Risk Analysis

Risk No.	Risk	Risk Severity	Risk Likelihood	Risk Avoidance
1	Losing Work	High	Low	Frequent back-ups of work to GitHub for my code and OneDrive for my documentation.
2	Illness	Medium	Medium	Leaving time free for unforeseen circumstances and trying to finish tasks early to be ahead of the curve.
3	Project Scope Change	High	Medium	Allowing extra time for additional features, and scope changes.
4	Scheduling Flaws	Medium	Low	The Gantt chart and work plans will help alleviate confusion about deadlines and allow me to see if I am ahead or

				behind where I need to be.
5	Poor Productivity	Medium	Medium	I will try to avoid assigning too much work in one day, to avoid "burn-out", and ensure there are scheduled days off in my work plan.

Risk Matrix

Severity \ Likelihood	Low	Medium	High
Low			
Medium	**4**	**2, 5**	
High	**1**	**3**	

Work Plan

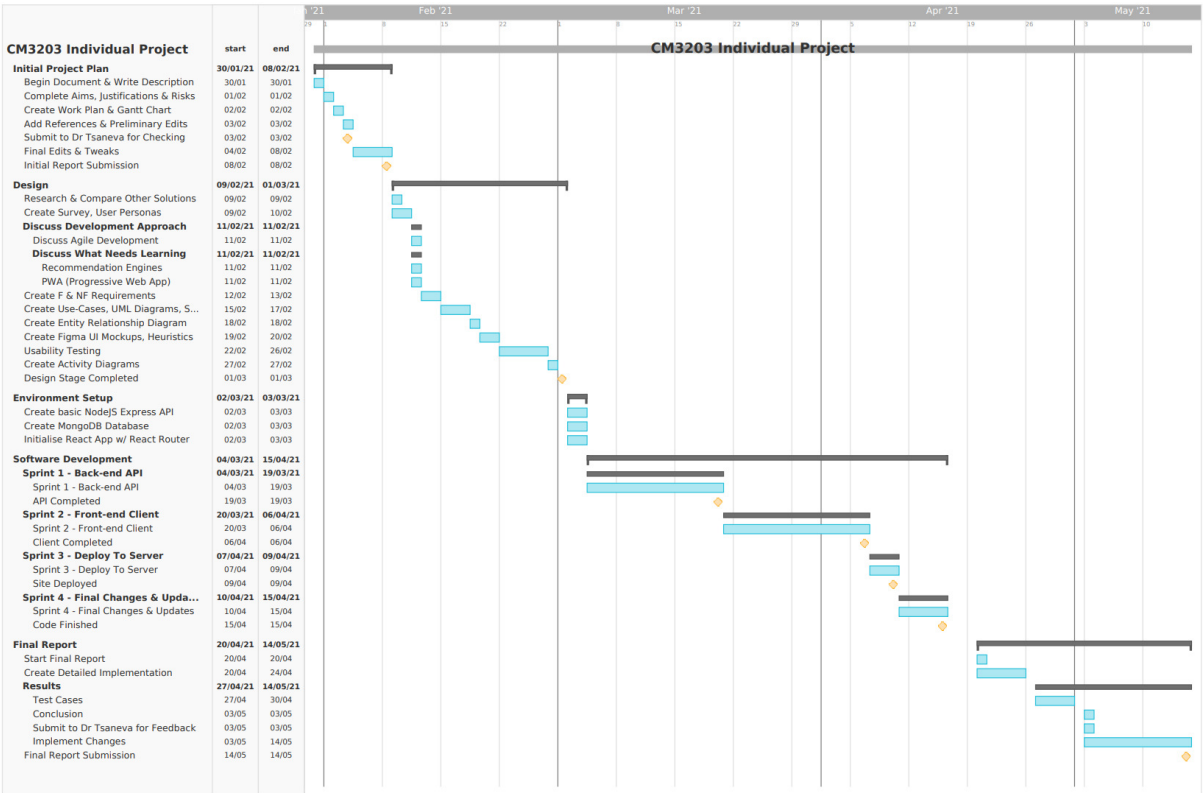
Week	Task(s)	Deliverables
Week 1 – 25/01/2021 to 01/02/2021	- Research Tinder UI design methodologies - Research JavaScript-based recommendation systems - Begin work on the initial report, including project description, aims and objectives and risks	N/A
	Milestone – N/A	
Week 2 – 01/02/2021 to 08/02/2021	- Work further on initial report, adding work plan, completed Gantt chart, and references - Submit initial draft of report to Dr Tsaneva (Supervisor) for feedback - Implement recommended changes and submit the report	- Initial Report
	Milestone – Initial Report	
Week 3 – 08/02/2021 to 15/02/2021	- Being design stage - Discuss the development approach (Agile, etc.) - Discuss what requires learning (Recommender systems, PWAs)	- Discussion of Development Approach - Functional and Non-Functional Requirements

	- Create functional and non-functional requirements - Weekly supervisor meeting	
Milestone – First stage of design section of the final report		
Week 4 – 15/02/2021 to 22/02/2021	- Create use-cases, UML diagrams, and State Transition Networks (STNs) - Create Figma UI mock-ups, perform heuristic evaluation - Perform usability testing - Weekly supervisor meeting	- Use-Cases - UML - STNs - Mock-Ups - Heuristic Evaluation
Milestone – Second stage of design section of the final report		
Week 5 – 22/02/2021 to 01/03/2021	- Create activity diagrams - Refine UI designs from usability testing - Begin environment setup, creating the basic API, setting up a MongoDB instance, and initialising the client React app - Weekly supervisor meeting	- First Section of Final Report
Milestone – First section of final report completed		
Week 6 – 01/03/2021 to 08/03/2021	- Begin software development - Work on back-end API implementing authentication, with JWT tokens - Weekly supervisor meeting	N/A
Milestone – API Authentication		
Week 7 – 08/03/2021 to 15/03/2021	- Continue to work on API, adding routes for user information, getting user feedback on certain books, routes for getting recommendations - Test and fix any issues in the API - Weekly supervisor meeting	N/A

Milestone – Implementation of Main Recommendation Functionality		
Week 8 – 15/03/2021 to 22/03/2021	- Finish API - Begin implementing client, and user interfaces - Implement Redux for global state management - Create navigation, and ensure responsive design - Weekly supervisor meeting	- Finished Back-End API
Milestone – Finished API, Beginnings of Client		
Week 9 – 22/03/2021 to 29/03/2021	- Continue work on the client - Start with authentication pages, such as the login and registration flow - Begin creating main usage loop, of swiping on books and refining recommendations - Work on profile page, and allow for editing the profile - Weekly supervisor meeting	N/A
Milestone – Created main UIs		
Week 10 – 29/03/2021 to 05/04/2021	- Test and solve any issues in the client - Finish front-end client - Begin work on deployment to server - Setup Apache virtual host - Setup PM2 process management - Weekly supervisor meeting	- Finished Front-End Client
Milestone – Vast majority of deployment		
Week 11 – 05/04/2021 to 12/04/2021	- Finish site deployment - Weekly supervisor meeting	N/A
Milestone – Site deployed		

Week 12 – 12/04/2021 to 19/04/2021	- Time allowed for unforeseen circumstances - Weekly supervisor meeting	N/A
Milestone – N/A		
Week 13 – 19/04/2021 to 26/04/2021	- Begin final report - Write abstract - Create a detailed implementation report - Weekly supervisor meeting	- Implementation Report - Abstract
Milestone – Finished first section of final report		
Week 14 – 26/04/2021 to 03/05/2021	- Begin results section - Write test cases - Write conclusion - Weekly supervisor meeting	- Test Cases - Conclusion
Milestone – Finished second stage of final report		
Week 15 – 03/05/2021 to 10/05/2021	- Finish conclusion - Submit to Dr Tsaneva for feedback - Weekly supervisor meeting	- Preliminary Final Report
Milestone – Final report submission to Dr Tsaneva		
Week 16 – 10/05/2021 to 17/05/2021	- Add final edits to final report - Submit final report - Weekly supervisor meeting	- Final Report
Milestone – Final Report		

Gantt Chart



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