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A Computer application to manage exercise regimes based on a database of gym routines

EMA: The Final Project Report

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TM470

The computing and IT project

Abstract

The report summarises the development of a database of gym routines, which clients can use as a tool, towards achieving their health and fitness goals. The objective was to produce a working application, which can be incorporated within a social fitness app. The Waterfall Methodology was used to supervise the ebb and flow of progress, highlighting the interactions, research and inspirations used to accomplish the finished product. The report examines the journey in which the app was constructed, the methods used to accomplish each development phase, complications I needed to overcome, and finally a summary on how these experiences have helped me grow as an individual. The report summarises my thoughts on how I think the project went, as well as the improvements I can take into consideration when descending upon my next project.

Keywords: database, fitness, routine, project, waterfall

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1 Introduction

1.1 The problem description

My chosen category will be a development project. I credit Web mobile and cloud technologies (TM352), Web technologies (TT284) and Object-orientated Java programming (M250) as the inspiration behind my decision. Specifically, the final assignment formulated a sequence required to develop a web application. I will enhance the knowledge gained from (TM352) and (TT284), by developing a live web application, which will advance users eager to better their health and wellbeing with the use of fitness.

This project will prove an asset in reducing possible injuries, elevating the results of each regime, and recommending exercises based on the users' level of experience. Gym users will be pleased with an extensive range of exercises which will keep things fresh and challenging.

1.2 Goals of the project

The project will explore a broad range of skills required on both the client side, and the server side, to operate the web application. Also, the project will showcase the soft skills required to manage key stages of a project. I will be operating as the Project manager, the UI/X Designer, and the Full Stack Developer. My project will include a front-end UI framework (Bootstrap) to showcase my HTML /CSS and JavaScript skills. A server-side language (PHP) to program the business logic. A database management system (MySQL) to populate the relational database. To add to this, my project will showcase research capabilities, feeding the database with accurate data which will benefit the progress of the end user.

1.3 Background

I am a devout Web Development and exercise enthusiast. I see the benefits of both sides; therefore, I want to commit to a project which will showcase my passions for both subjects. Developing a fully operating application will provide me with the confidence to pursue an exciting career within the world of IT.

1.4 Project Deliverables

Project phase	Deliverable name	Deliverable description
Research	Exercise collection	A library of accurate, safe and reputable exercises will be required to build a collection of data which will be populated in the database.
Planning	Management system to populate the database	Management system will be required to manage and maintain the database. This will involve creating new tables/ rows, reading the data, updating the data, and deleting the data

	Database schema	A visual diagram will be required to showcase the database objects, primary keys and their relationships with each other.
	Project log	Will be required to document progress for the evaluation process to be carried out in the final report.
Design	Wireframes/ flowcharts	Designs on the flow of the application will need to be approved before development to ensure it meets the requirements.
Development	Front end user interface	The project will require a fully functional front end user interface, which will distribute the clients request for information from the database, before returning the result of that request. Simplicity and Speed of results must be prioritised, to adapt to any environment the user wishes to perform in.
	Web Server	A web server will be required to host and deliver requests to the user. The project will be a final product; however, a remote server won't be required. The web application will be hosted locally, which will help throughout the testing phase.
	Application server	Application server will be required to retrieve and distribute requests from the user. The application server will collaborate with the web server to return results to the user browser. The connection will be transmitted using via HTTPS.
	Database	A relational database will be required to hold the collection of data. The data will be modelled into a set of tables with columns and rows.
Testing	Software testing	Once the project is near completion, a testing procedure will need to be in place. To ensure the application is functioning correctly, grammar errors and duplicate entries are identified, and information is stored within the correct elements.
	Final report	An official report will be required to showcase my findings and evaluate what went well, what didn't, and any improvements that can be made.

Figure 1.1 Project deliverables

1.5 Project Scope

Project scope statement			
Title:	A Computer application to manage exercise regimes based on a database of gym routines	Date:	20 th September 2021
Project Manager:	Kyan Keise		
Project justification:	The application is being undertaken for the purpose of creating a user-friendly, web search facility outlining various exercise regimes. Which will target gym users, and provide them with the most sufficient exercises, matched with their level of experience, equipment available, and muscle groups they intend to target.		
Project objective:	To create a fast efficient fitness tool recommending the best exercise routines. Using the most suitable equipment available, targeting the required muscle groups. Recommend exercise regimes, that are in line with the end users' current level of experience. Helping gym members achieve their physical and mental goals.		
In scope:	<p>Access in the form of a web page, application will be conducive and capable when requesting knowledge.</p> <p>The search facility will be accessible, quick, and provide a comprehensive description on a diverse range of workouts.</p> <p>The search facility will consist of a clear user interface, enabling gym users to examine a collection of exercises.</p> <p>The facility will provide the name of each exercise, followed by a description on which muscle group and category the exercise belongs to, as well as the level and equipment required.</p>		
Out of scope:	<p>Workout plan creator/ timer</p> <p>Membership profile</p> <p>Workout goals/tracker</p> <p>Nutrition/Calorie counter</p> <p>Geolocation</p> <p>Wearable device integration</p> <p>Notification system</p> <p>Customized diet plan</p> <p>Social sharing platform</p> <p>Gamification</p>		
Approach:	My approach will include research, interaction with key stakeholders, and lastly a clear schedule, which will outline the key milestones required to complete the project. This project process will be accomplished by following a sequential approach, branched into specific phases.		
Constraints:	<p>Insufficient database knowledge, not meeting the required deadline. Insufficient skills to program the business logic. Not producing a UI simple enough to use.</p> <p>Inaccurate advice, potentially leading to Legal, Social, Ethical, and Professional implications.</p>		
Success:	My project will be assessed by its quality, stakeholder satisfaction and meeting deadlines.		

Figure 1.2 Project scope statement

1.6 Lifecycle methodology

My chosen methodology will be the Waterfall Model. This is a small-scale project; the deliverables are known and clear. Requirement's analysis will be accumulated at the beginning. Therefore, I can adopt a linear approach which will transition through each phase sequentially.

A Gantt chart will be used to illustrate my project schedule. I will make use of its tracking features, such as the checklist function, the progress bar, as well as a minute counter. This will be updated as each task is completed. This is to ensure I can keep on top of deadlines, together with making sure the requirements have been met.

2 Account of related literature

2.1 Design

(WAI), 2021) this is a design orientated framework geared towards improving the user experience. W3C is a well-respected international organization, set up with standards to ensure long-term growth of the World Wide Web. I will incorporate design standards within my own UI to promote better user experience. My key focus will be to ensure the UI is accessible for as much as the population as possible. With the help of a complimentary colour palette, a font style which is easily recognisable, along with a simple layout for clear navigation. I will cover this source to boost both the UI/X.

(White, 2021) is a design approach to problem solving using the human perspective. The human centred design approach was recommended by the UX/I Designer ([Appendix 7.3.2](#)). CIO is a reputable platform, delivering the latest news for IT professionals. There are disadvantages regarding implementation and cost, however due to the size of my project this shouldn't become an issue. I will use this approach as part of my thought process. The source will contribute towards the development of the UI/X. This will complement the W3C guidelines.

2.2 Application Server

(Oluwatosin, 2014) outline the vital elements of the client server model. I discovered the journal on ResearchGate, a professional network for scientists and researchers, used to share and discuss relevant theories. The journal introduces the relationship between the client and the server. My application will be dependent on user input on the client side, whilst obtaining this information from the database. My application server will adopt the client server model. This journal will be used as a guideline, to ensure I understand the fundamentals, whilst learning how they work together.

(Monus, A., 2021) contain the top 13 recommended scripting languages. It provides an overview on the purpose of a scripting language. PHP will be the chosen language, due to the fact it can be embedded into HTML, It's a general-purpose language, and its open source. I have experienced PHP in a previous module.

(PHP: Hypertext Pre-processor, 2021) is the official documentation which will remind me of all functionalities within PHP. I will research pre-existing functions, together with the basic functions within the language. This source will be used to assist in programming the business logic. This will help regarding validation techniques on the server, along with how I want the server to respond to requests of the client.

(Database, Leotta and ZHANG, 2021) discovered on Stack Overflow. Stack Overflow is a reputable knowledge sharing platform for Developers. Whilst it won't serve as a main source of information due to accuracy concerns. It will prove useful, especially when seeking alternative programming methods. Before I use this platform, I will check for validation, using its integrated popularity rating system. This will determine how helpful the solution is likely to be, based on its ratings.

2.3 Database

(Astera, 2021) outline key components of a relational database. Furthermore, the article encourages good database design principles. Key features include avoiding redundant data, along with ensuring the information is accurate. The article addresses two common design techniques, Normalization and Entity-Relationship Modelling. Normalization techniques help reduce data redundancy, whilst the latter define relationships amongst entities within the database.

Entity-relationship modelling will be the approach I will adopt to construct the database. Experimentation by populating the tables with mock-up information will be the approach I will use for testing purposes.

(Designing a Relational Database and Creating an Entity Relationship Diagram, 2021) expands on the design principles within a relational database. Towards Data Science is a professional platform, which grant independent authors the opportunity to publish articles among data science. This will be utilized, in conjunction with (Astera, 2021) throughout the database design phase.

(Datanamic, 2021) provide further design techniques based on the relational database design. This will help distinguish entities, along with the relationships between them. It acts as a guideline of rules that must be followed to enable simplicity and efficiency. I will use this source to identify the entities of my database, whilst identifying the relationship between each other. I will apply the many-to-many relationship concept to the database. This source relates to my project, due to the fact a relational database will be required to populate different exercises.

(MySQL: MySQL Documentation, 2021) provide official documentation to support MySQL. This source will be used to research data manipulation statements. I will make use of the “CRUD” statements, which will assist in creating the tables and the rows. This source will provide me with an in-depth description on each statement, together with an example of how that statement can be implemented.

(Mark Otto, 2021) provide official documentation to support Bootstrap components. I will use this source as a reference in aid of designing the UI. I will make use of the Bootstrap library when styling the UI, these include button styles, dropdowns, navigation tabs and so on.

(Contributors, 2021) is the official support source for phpMyAdmin. As recommended by my tutor ([Appendix 7.7](#)), This tool will be used to administer the database, together with testing to ensure the data has been populated correctly.

2.4 Exercise data

(Bodybuilding.com. 2021) used to carry out initial research ([Appendix 7.4](#)).

Bodybuilding.com is one of the world’s leading fitness platforms. For this reason, I believe the information is credible to include within my collection of exercises. This will be used as one of my sources when populating the database.

I will combine this with two other sources, (Exercise.com. 2021) and (WorkoutLabs. 2021). Both sources formed part of the initial research carried out during the research phase.

3 Account of Project work and its outcome

3.1 Requirement's analysis

Initiated the requirements analysis, by comparing three leading fitness platforms. Identified the key features from each website. The search engine is the focus point ([Appendix 7.4](#)). My solution needs to be straightforward; the data gathering needs to be authentic. Therefore, an analysis on the UI, the speed of results, and the authenticity of the search needs to be prioritised. Collecting this information has equipped me with a broad understanding, on the expectations, Regarding functional/ non-functional requirements.

Overall, the research was vague, on the other hand it was enough for me to advance, towards identifying the functional requirements. Looking back, I could have conducted qualitative/ quantitative research in the form of a questionnaire. The questions would be geared towards the usability of each platform. However, deadlines need to be taken into consideration, furthermore it proved valuable enough for me to progress to the next phase.

3.1.1 Functional requirements

Based on experience gained from (TM352), I managed to identify the functional and non-functional requirements within the scope of the project. Defined the basic system behaviour ([Figure 3.1](#)), ([Figure 3.2](#)), included a primary understanding on what the system does, as well how it should respond to user input.

Functional requirements	Name	Descriptions	Obstacles
FR1	User will be able to select a muscle type, a category, a level, and a chosen equipment	The application will allow the user to select one of 4 categories. The user can fill in one, or all options depending on what exercise selection they require.	The drop-down boxes don't display all the exercise options which would limit the user's search.
FR2	User can submit a request	Once the user has selected their inputs, the application will allow the user to submit their request.	The submit request does not contain the necessary scripts to retrieve the correct information from the database.
FR3	User can cancel a request	If the user decides to cancel their request, the options selected are refreshed leaving the user	The application does not respond to this request. Instead, the initial inputs remain preventing a new search.

		with the option of starting a new search.	
FR4	The application displays the results from the search	Once the request has been the sent, the application server should retrieve the correct information and present that information to the UI.	Errors in the business logic display the wrong exercises. This could leave users attempting exercises not in line with their current skill set.
FR5	User wishes to start a new search	Once the first result has been displayed, there should be a button or link visible for the user to conduct a new search.	There may be no clear way to start a new search leaving a reliance on refresh function within the browser instead.
FR6	User should be able to accept or decline the disclaimer	The user should have the option to agree or decline the disclaimer this will be in the form of two buttons.	User could disagree with the disclaimer but still gain access and vice versa. The user may accept the disclaimer and be expected to accept it every time they want to use the application
FR7	User should be notified when no results are found from their search	User should be notified if the options selected doesn't contain any related information.	User could become frustrated if multiple searches present no results.

Figure 3.1 functional requirements

3.1.2 Non-functional requirements

Non-functional requirements	Name	description	Obstacles
NFR1	Accessibility	The system must be accessible and simple to use amongst an extensive audience.	System implemented could be difficult for others to use, or the layout could encourage complexity.
NFR2	Good data Validation	Data validation methods need to carry out checks, to ensure the quality and the accuracy of the data are correct.	Poor validation may lead to the wrong data types being populated. As well as duplicate entries.
NFR3	Reliable information	The information within the database must be accurate and display exactly what the user has requested.	Data population may be inaccurate leading to invalid results
NFR4	Efficiency	The application needs to be fast when displaying results	System could run very slow at generating results leading to performance issues

Figure 3.2 non-functional requirements

3.2 Design

3.2.1 System Architecture

A server will be required to run the application, as well as testing during the development phase. Cost was a factor, along with simplicity, and size of the application. For this reason, a local server environment proved to be the best solution. Further research led me on to MAMP. (Figure 3.3) illustrates my chosen solution stack. This was chosen as a result of installation concerns, related to my initial LAMP environment (Appendix 7.1). The operating system will be MacOS, the web server Apache, the database management system MySQL, and lastly PHP will be the server script language.

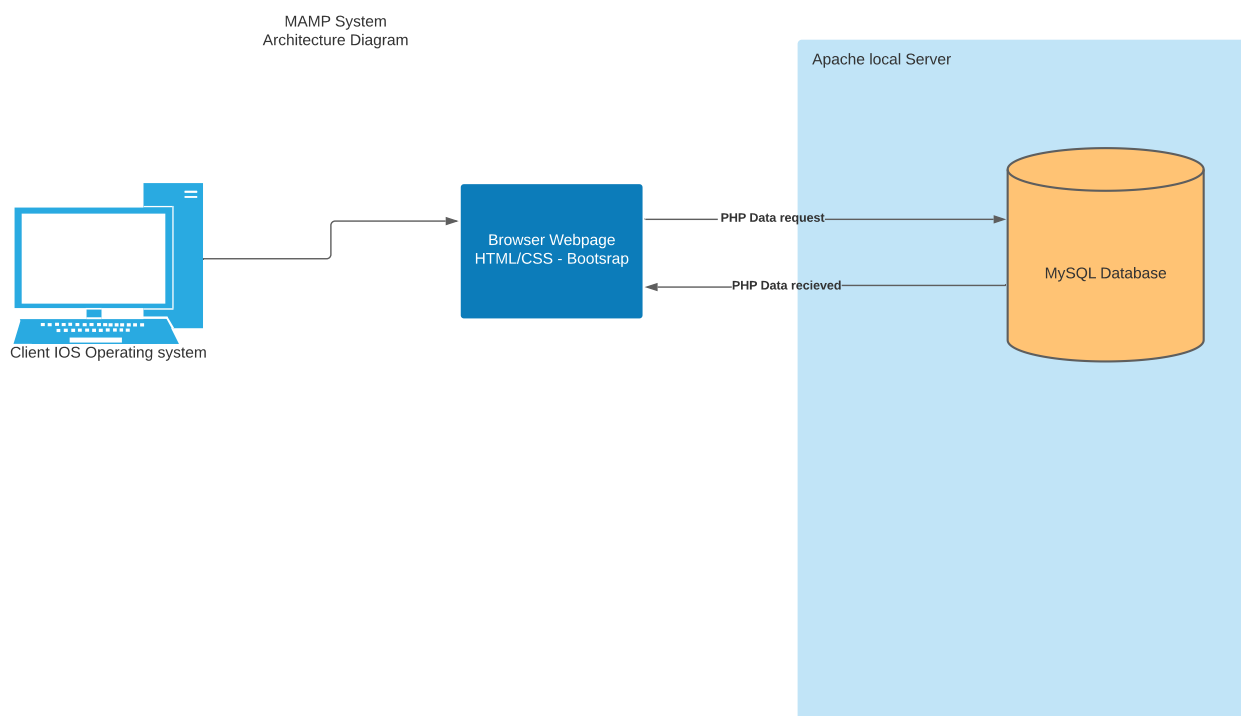


Figure 3.3 The structure of the web application

3.2.2 Flowchart

A visual representation was needed, to represent the decisions needed for the application to process. There was a need to showcase how the application is going to function, hence why a flowchart was chosen. (Figure 3.4) represents a step-by-step analysis of the given problem. This is how the application will respond to the end user's requests. The first page will contain the disclaimer page. The user will have the agree or disagree with the terms presented. If the user disagrees, they won't be granted access, instead they will be redirected to Google to seek an alternative solution. However, if they agree with the terms, they will be granted access to the application.

The user will be given four selection options, each will contain a list of muscle types, category types, levels and equipment. This will enable the user to choose a combination to their liking.

Once submitted, the request will be sent to the application server, which will obtain the information from the database. The data is sent back to the application server, once validation protocols clear, the UI will present the result, which will enable the user to interact with their request.

There is an option for the user to cancel their search should this be required. Once selected, the page will reset, and resort back to default, so that new search can commence.

There were queries as to whether a cookie should be included within the disclaimer page. The cookie will remember the user's choice for a set amount of time. This will save the user from having to agree to the terms until the set time expires. The repetition would have a negative impact on the user experience, hence why the decision was made to incorporate this.

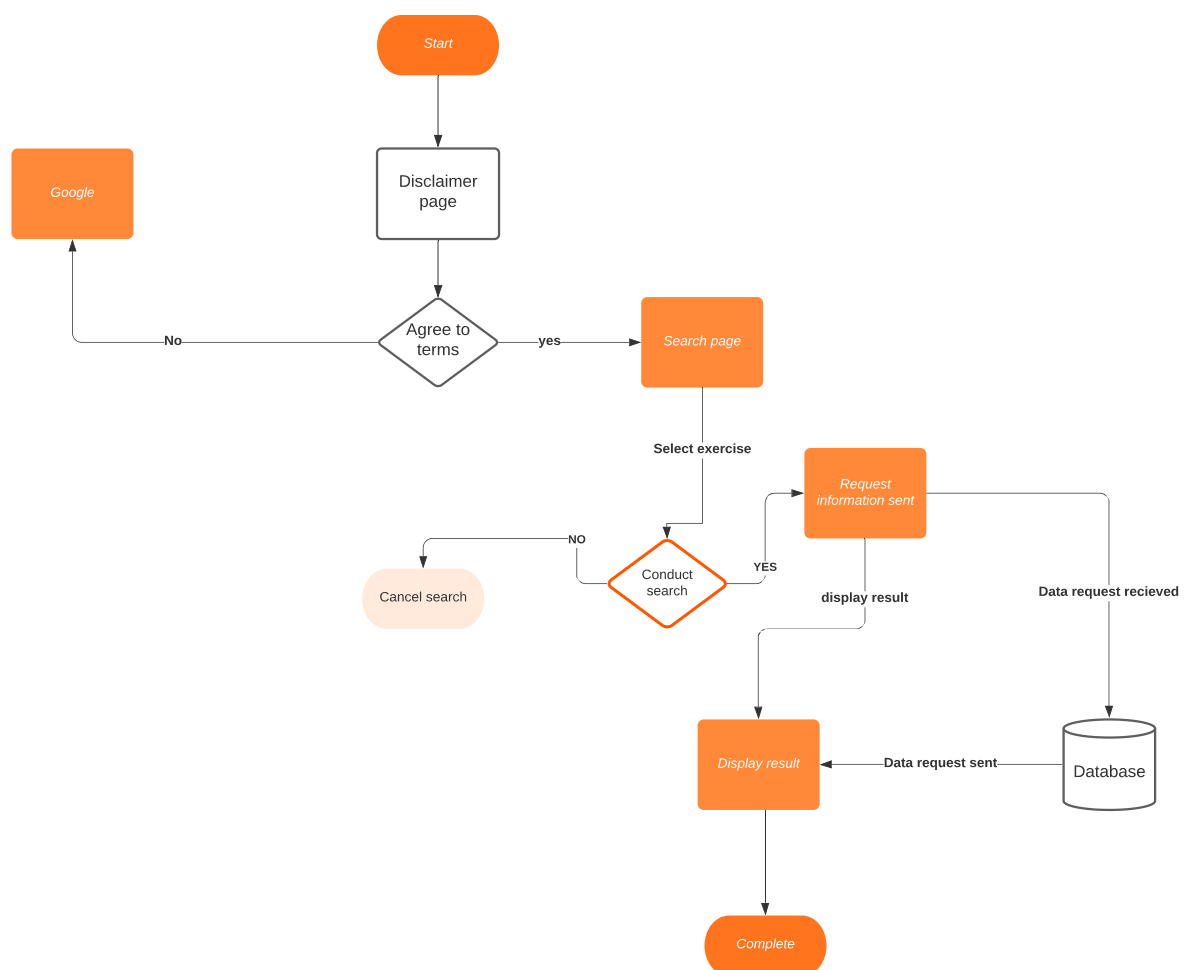


Figure 3.4. Flow chart which displays the sequence of activities involved in the process

3.2.3 User interface design

Two designs have been created based on the Human-centred design (HCD) approach, as recommended by the UX/I Designer ([Appendix 7.3.2](#)). In my opinion, the initial design ([Appendix 7.2](#)) would exhibit a superior user experience. This is due to a variety of interactive options for the user. The design includes a combination of images, descriptions, the ranking system, along with clear navigation. Nevertheless, time constraints need to be considered, an in-depth UI will take longer implement, therefore deadlines could be affected. For this reason, the simpler design ([Figure 3.5](#)) proved to be the way forward. I anticipate the business logic drawing most of my attention. This means I can focus more of my efforts into maximising that phase, in order to keep missed deadlines to a minimum.

(TT284) introduced me to several benefits in creating accessible, useable webpages, adopting mark-up languages such as HTML, and Cascading Style Sheets (CSS). I was exposed to the importance of abiding by W3C standards. Therefore, I will make use of it, by incorporating some of their recommendations within my design. The challenge is designing a web page simple enough for the data to flow, whilst providing enough engagement to the end user. I Applied the human centric approach (White, 2021) by imagining how the user would react through every step made. Wireframes are finalized ([Figure 3.5](#)). The structure is simple to follow, I will admit it's not the most eye catching, however I'm adamant the implementation of the business logic will be simpler due to its limited functionality.

Each page contains a navigation tab. The left-hand side display the name of the program. I opted for (TM470) as it references this module. The new search tab is located at the top far right, this will link to a new search page. This will give the user another option to refresh the application. Each page will have a clear heading, at the top left-hand side of each page. The headings will be clearly visible to the user. The blue padding at the top of the page will be used as a design feature, to separate the navigation from the drop-down fields. Every page will contain the same font style and size. The Bootstrap default font will be used.

Each page will contain a footer, this will include my name, along with a copyright symbol. The colour will be the same as the navigation to boost familiarity. The buttons are the same colour as the padding above the heading. The font will be white to help with the contrast. The disclaimer page will contain two buttons. This allows the user to decide, whether they agree or disagree with the terms and conditions. The search page will be made up of a form. The form will have four drop-down fields, each will contain all available options available to the user. The search results page will display the users request in the form of a table. This table will have 3 columns, the first will hold the id number, the name of the exercise, in conjunction with a description of each exercise.

The lines on the diagram demonstrate the flow of data throughout the application. The background will be white to contrast the blue, this will present a clear layout. The font colour will be dark grey, to lessen the contrast between the background and the font.

The second diagram ([Figure 3.6](#)) represents the complete prototype of the design. This has provided a realistic representation of what the UI is going to look like in its live form. Overall, I am happy with the prototype and the wireframe, it will be easier to refer to them as a visual representation, whilst in the application is in development.

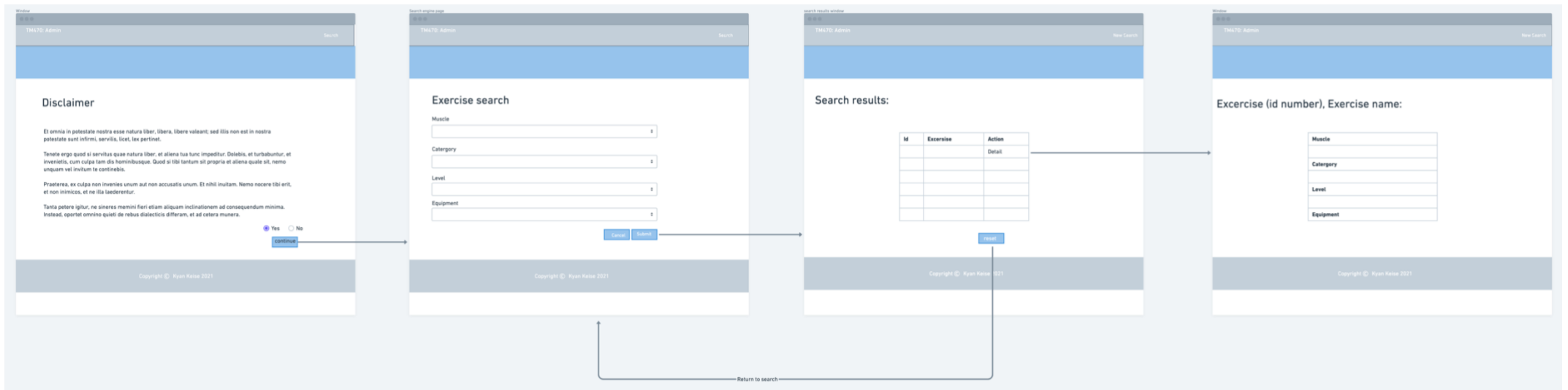


Figure 3.5 Diagram which illustrates the flow throughout front end design

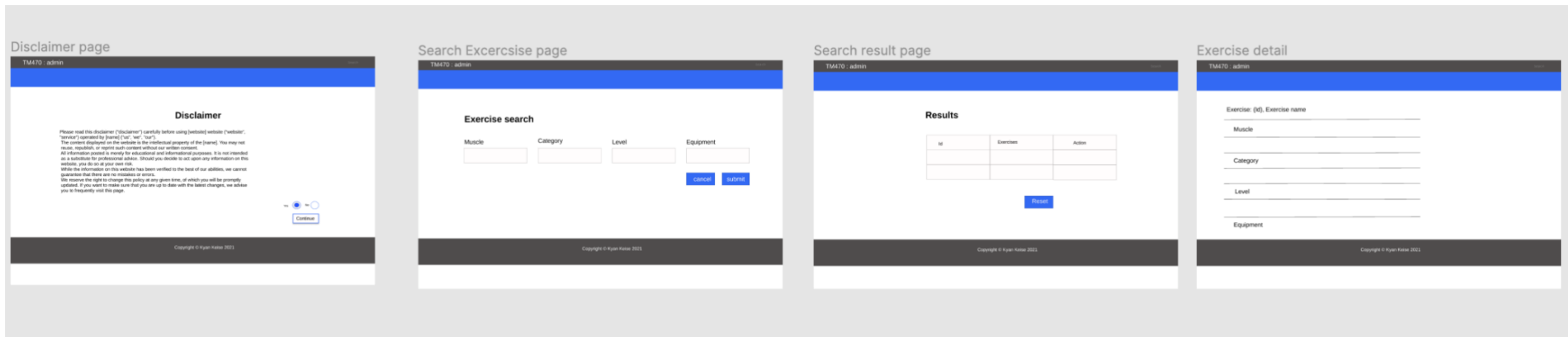


Figure 3.6 Schematic diagram which illustrates the interface of my design

3.2.4 Database

My database knowledge is limited in comparison to the other deliverables. (TT284) demonstrated how to assign data to the OU database using PHP, but not to construct the database itself. There was more emphasis on cloud storage. For this reason, it was essential to conduct requirements analysis beforehand, which not only helped me understand the fundamentals, the knowledge also equipped me with the confidence to design the database. The database model will be relational as recommended by the Back-end developer ([Appendix 7.7.3](#)). Therefore, my sources are geared towards good relational database design methods.

3.2.4.1 Requirement's analysis

The entity relationship model has been used to identify the key entities, followed by the relationships between them. After further research, I decided to adopt an atom/molecule analogy to represent the relationship between each element ([Figure 7.2](#)). Exercise will act as the primary key, the other elements have been identified as atoms, these are category, equipment, muscle and level. The molecules identify the relationship they have with each other. These are exercise_catergory, exercise_equipment, exercise_muscle, exercise_level and exercise_detail. Each element will be identified by their ID number.

3.2.4.2 Database design model

The schema will consist of 5 tables ([Figure 7.3](#)). The first table will be exercise, followed by category, level, muscle, and equipment. Exercise will include a collection of various exercises; the category table will group these exercises based upon a particular practice. The level table define the difficulty of each exercise. There are 3 levels, beginner, intermediate and expert. The equipment table consist of Gym equipment, which can be used in conjunction with the exercise. Lastly, the muscle table will contain most the muscles within the human body, along with exercise methods that are likely to compliment that muscle.

([Figure 3.7](#)) represents a data model of the relational database. The diagram identifies the attributes and how they relate with one another. The exercise element is the primary key. The relationship between each table is many to many. The data type for each ID is integer. The data type for each field is varchar, with a maximum of 128 characters. The exercise detail table has a one-to-one relationship, due to its multiples relations with the other tables.

Overall, I am happy with my design. It complements the data for my application nicely. My application will contain a medium sized dataset, which is not enough to consider alternative options such as a non-relational database.

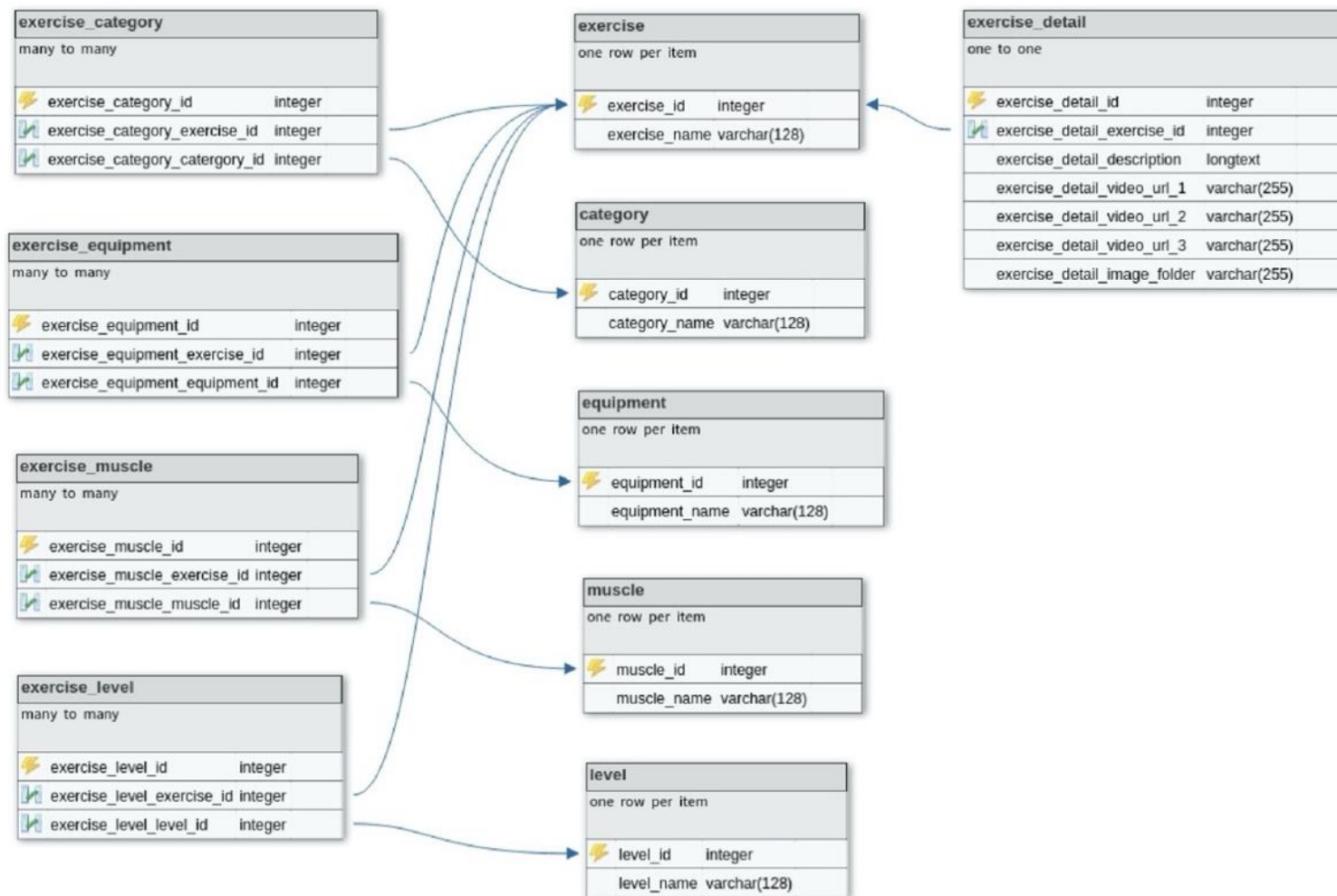


Figure 3.7 Models the relationship between each component and data into a set of tables made up of rows and columns

3.3 Implementation

3.3.1 Environment

1. Installed MAMP.
2. Installed apache as the web server.
3. Installed php as the script server.
4. Installed MySQL as the database server.
5. Ran <http://localhost:8888/> checked the configurations, confirmed all requirements have been successful installed.

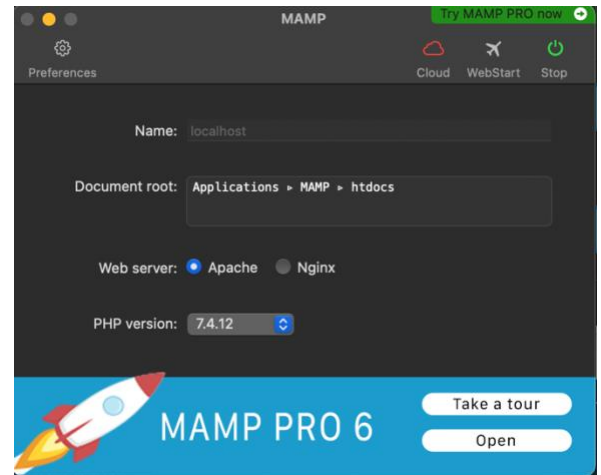


Figure 3.8 MAMP Successfully installed

MAMP serves its purpose for this project. It has proved to be a simple way to host the local server.

My work environment is set up. (TT284) made me comprehend the importance of working in clear environment. I created two repositories, one for backups, the other for experimentation and testing purposes. Once a phase is complete, its marked as final and will be added it to the server. The structure helped keep things in order and helped prioritise what needed to be done.

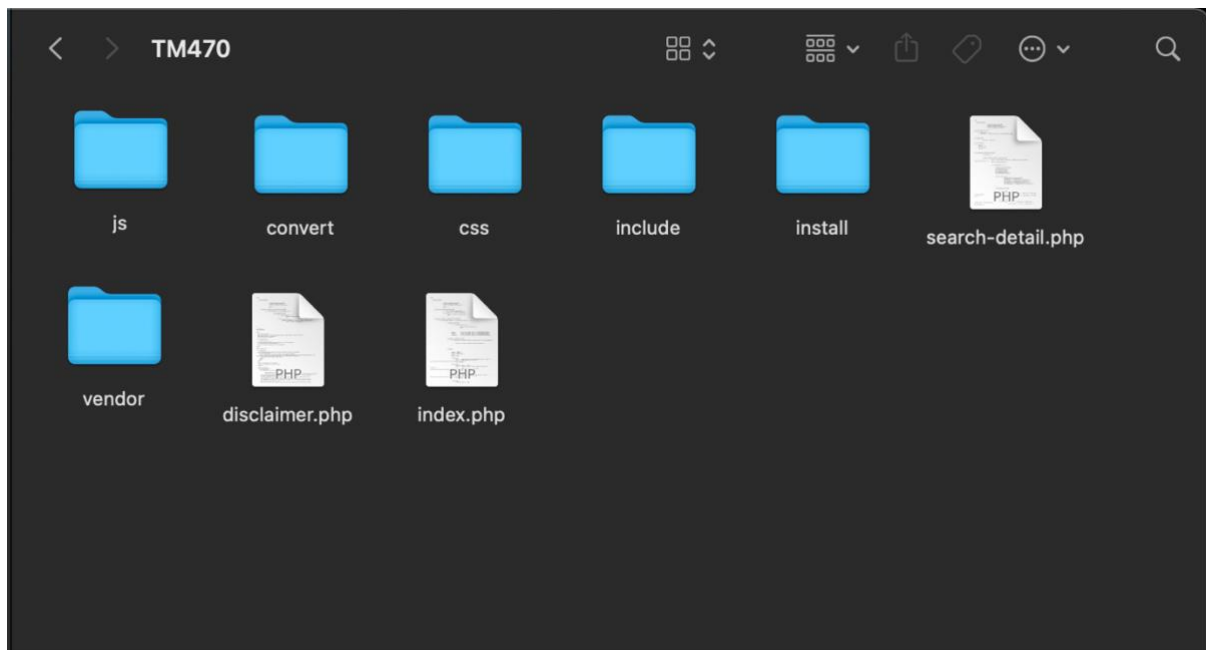


Figure 3.9 Working environment

Created the root folder, named it TM470. Inside this folder contain the user interface scripts. disclaimer.php is the disclaimer page, index.php is home to the search engine. Search-detail.php will display the search result.

Vendor contains the installation scripts for Bootstrap and jQuery. Js contain JavaScript code, CSS contain the required style sheet scripts from Bootstrap.

Convert folder which will have the installation scripts and raw data. The data populating scripts will be kept in here.

Created the include folder, this will have static information which will hold information, such as the database connection/ login details.

Created the install folder, inside will contain the installation scripts see ([Appendix 7.1 17/05 – 09/06](#)). To help prevent data loss, two backups have been created. The first is located on a local cloud server, the second will be kept on a removable usb stick.

3.3.2 User interface

Installed the Bootstrap framework. No issues setting up, I have used this frequently in the past. Integrated the bootstrap core JavaScript, which will enable the scrolling navigation. imported the Bootstrap CSS which will enable me to make use of their default CSS options.

Once installed, began designing the user interface. Made use of (WAI), 2021) by following the useability guidelines. Each section has their own id for styling purposes. The main section will contain the form, with four attributes, which will contain drop down tabs for user to choose from.

Styled the design with the same palette confirmed in the prototype. This phase was completed on time. There were no significant issues other than simplifying the design. Design is now ready for the next phase which is to programme the application server.

Bootstrap has helped quicken the design process. Design is clean, the overall presentation is professional and simple.

Disclaimer

Please read this disclaimer ("disclaimer") carefully before using [website] website ("website", "service") operated by [name] ("us", "we", "our"). The content displayed on the website is the intellectual property of the [name]. You may not reuse, republish, or reprint such content without our written consent. All information posted is merely for educational and informational purposes. It is not intended as a substitute for professional advice. Should you decide to act upon any information on this website, you do so at your own risk. While the information on this website has been verified to the best of our abilities, we cannot guarantee that there are no mistakes or errors. We reserve the right to change this policy at any given time, of which you will be promptly updated. If you want to make sure that you are up to date with the latest changes, we advise you to frequently visit this page.

NoYes

Figure 3.10 Disclaimer page

TM470

Search for exercises

Muscle

Category

Level

Equipment

Cancel

Submit

Figure 3.11 Search page

TM470

New Search

Search results:-

Id	Exercises	Action
No exercises were available for this request		

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Figure 3.12 Search detail page

3.3.3 Exercise data gathering

The dataset is now complete. Data gathering was initiated early in the project. I was able to do this, due to the fact the aims of the project have been clear from the beginning. Amassed a total of 5,674 rows of data. All 3 fitness platforms were used to construct the data ([Appendix 7.4](#)). We had a rule in place, for every 100 exercises collected, the Personal Trainer and the Sports Scientist would validate the data and sign off, before adding to the spreadsheet. This gave me confidence knowing the selection was authentic and assigned to the correct exercise/ muscle group. The aim was to make the selection as unique as possible, whilst also being simple enough for a beginner to use. This was the reason why I decided to include as many categories as possible.

This would help prevent misuse from the end user, minimising potential legal implications.

3.3.4 Application server

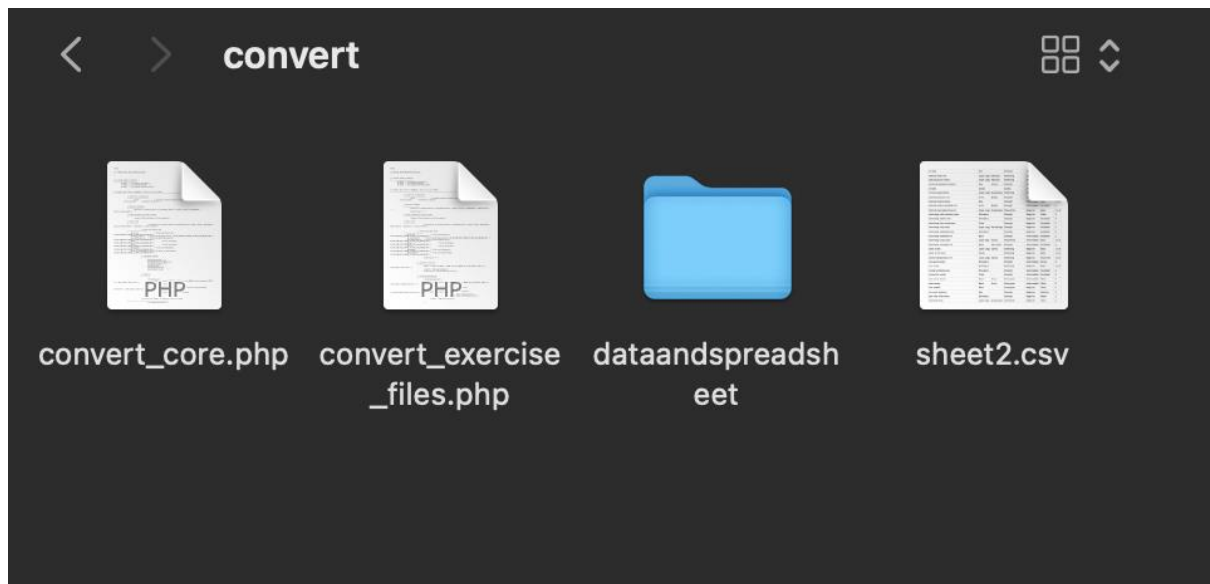


Figure 3.13 Convert folder exercise data and populating scripts

3.3.4.1 Convert Folder

I encountered a potential data population issue. The data set was too large to populate using phpMyAdmin. This would end up becoming a tedious exercise taking up a lot of time. Using previous experience gained from (M250), together with advice from Back-end developer, I decided to create an algorithm script ([Appendix 7.6](#)). The purpose of the script was to populate all the tables, using iteration tools and data structures such as for loops and arrays. The spreadsheet was converted to a csv file; I created two scripts due to the size of the dataset. Both scripts read and populate the database. Creating the algorithm wasn't an easy task, it took a lot of trial and error. Although it was a lengthy process, the time it would have taken to populate the database on phpMyAdmin would have overshadowed it by some margin.



Figure 3.14 Install folder install tables for database

3.3.4.2 Install folder

The `install_exercise.php` script has been created to install the tables within the database for more information please see [\(Appendix 7.1 26/05 – 27/05\)](#).

3.3.5 Database

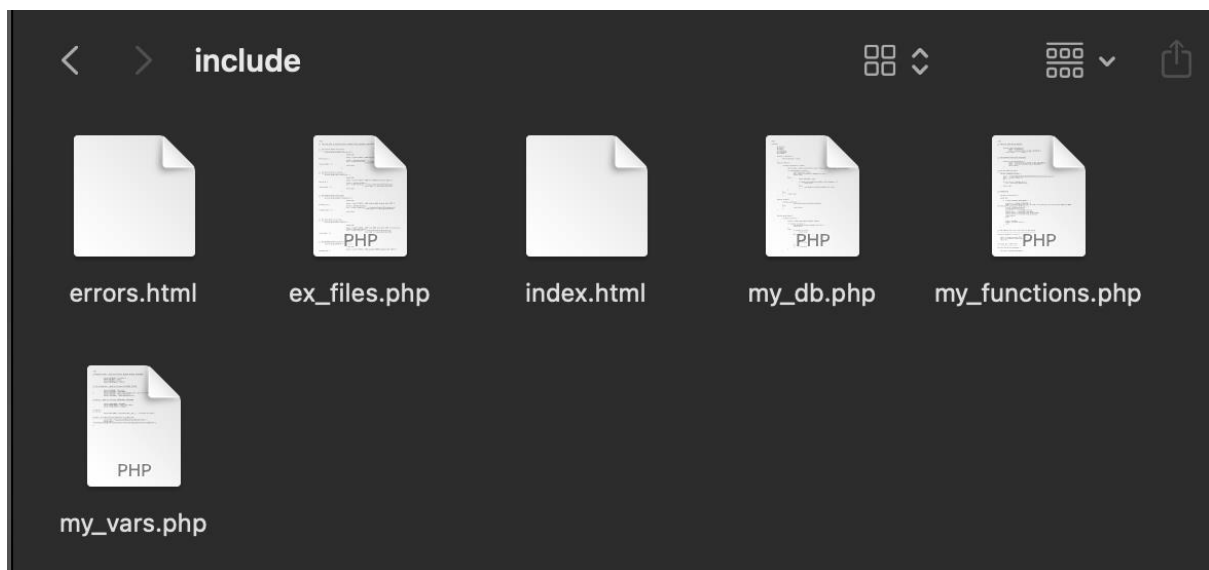


Figure 3.15 Include folder database creation

3.3.5.1 Include folder

Created an `errors.html` file, this will run in case of any errors, which occur on the client side. The `ex_files.php` contain functions created to get exercise details via its id number. The `index.html` page is just a trouble shooting page in case of any implications.

The `my_vars.php` page configures the database, by setting the user, password, and the servers location.

The my_functions.php scrip contain created functions used to clean the user input, along with the database value before updating the database see ([Appendix 7.1 19/05 – 20/05](#)).

The my_db.php file contain the database interface. This is where the connection is established; a new database object is initialized. Within the file contain two functions which carry out database queries. The second generates the last id number implemented within the database. For more information, please see ([Appendix 7.1 21/05 – 28/05](#)).

3.4 Testing

The development stage is complete. System testing carried out to ensure the application is working. The disclaimer page has loaded successfully. I ran a test by selecting the no button, wasn't granted access. Instead, I was directed to google. I selected yes instead; I have now been granted access to the search page. Tested the cookie by refreshing the page 10 minutes later, to make sure the webpage loads without having to agree to the disclaimer again. Test was successful. I am now going to populate the tables to make sure the business logic is correct.

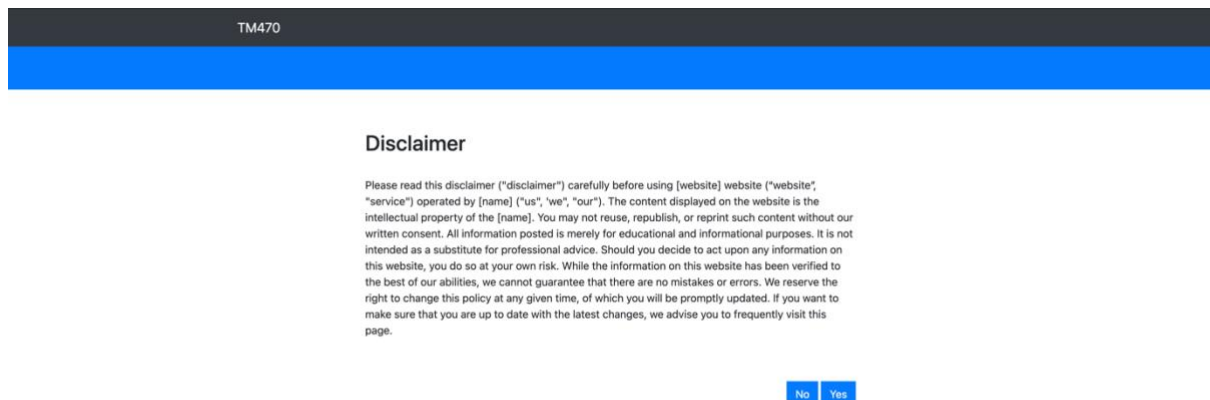


Figure 3.16 Disclaimer page

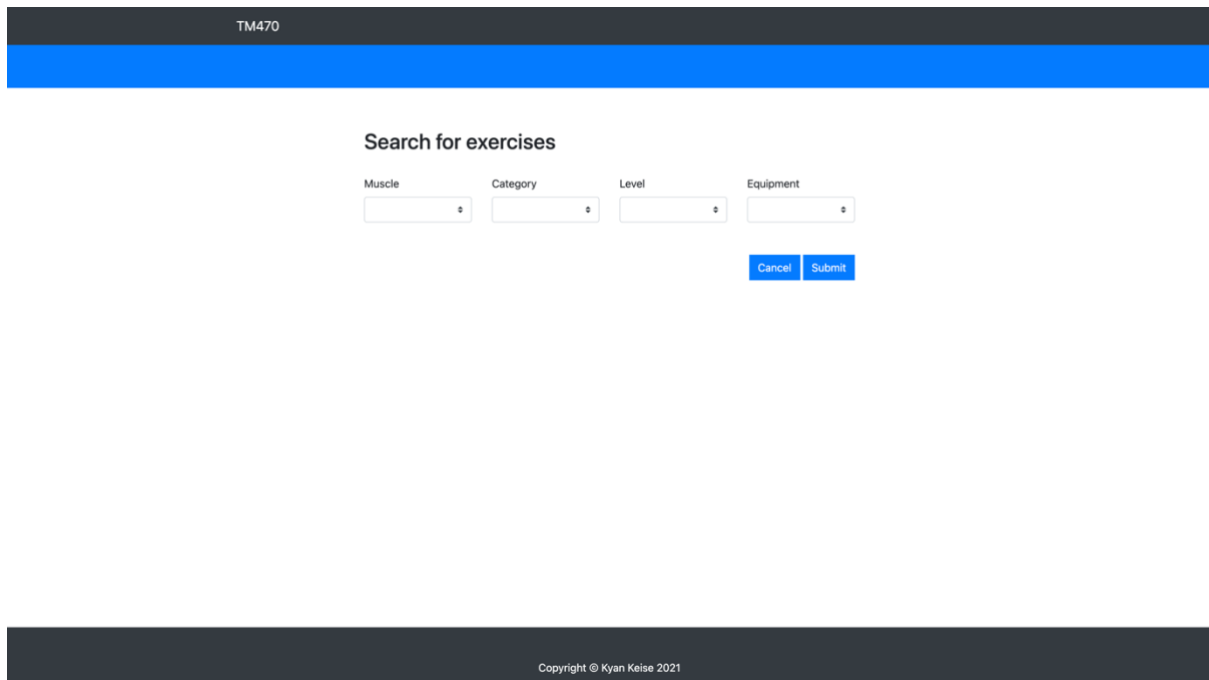


Figure 3.17 Search page

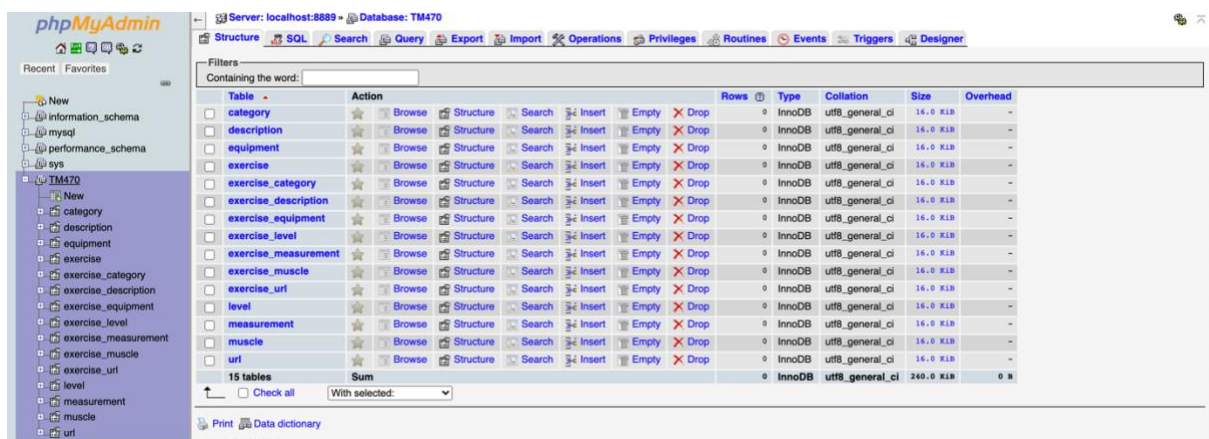


Figure 3.18 Before empty tables

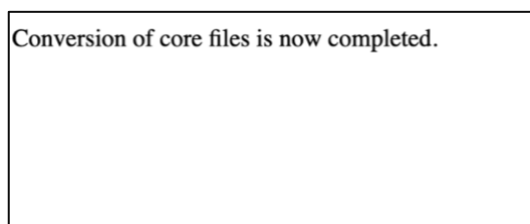


Figure 3.19 Core conversion complete

Conversion is now complete as demonstrated by the confirmation message (Figure 3.19).

Table	Action	Rows	Type	Collation	Size	Overhead
category	Browse Structure Search Insert Empty Drop	7	InnoDB	utf8_general_ci	16.0 KIB	-
description	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
equipment	Browse Structure Search Insert Empty Drop	13	InnoDB	utf8_general_ci	16.0 KIB	-
exercise	Browse Structure Search Insert Empty Drop	862	InnoDB	utf8_general_ci	80.0 KIB	-
exercise_category	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_description	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_equipment	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_level	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_measurement	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_muscle	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_url	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
level	Browse Structure Search Insert Empty Drop	4	InnoDB	utf8_general_ci	16.0 KIB	-
measurement	Browse Structure Search Insert Empty Drop	8	InnoDB	utf8_general_ci	16.0 KIB	-
muscle	Browse Structure Search Insert Empty Drop	23	InnoDB	utf8_general_ci	16.0 KIB	-
url	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
15 tables	Sum	917	InnoDB	utf8_general_ci	304.0 KIB	0 B

Figure 3.20 After tables populated

(Figure 3.20) confirms the table now has 917 rows, the populate script has been successful ([Appendix 7.6](#)). I will run a test on the next script.

Conversion of exercise files is now completed.

Figure 3.21 Script successful

Table	Action	Rows	Type	Collation	Size	Overhead
category	Browse Structure Search Insert Empty Drop	7	InnoDB	utf8_general_ci	16.0 KIB	-
description	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
equipment	Browse Structure Search Insert Empty Drop	13	InnoDB	utf8_general_ci	16.0 KIB	-
exercise	Browse Structure Search Insert Empty Drop	862	InnoDB	utf8_general_ci	80.0 KIB	-
exercise_category	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_description	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_equipment	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_level	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_measurement	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_muscle	Browse Structure Search Insert Empty Drop	1,392	InnoDB	utf8_general_ci	16.0 KIB	-
exercise_url	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
level	Browse Structure Search Insert Empty Drop	4	InnoDB	utf8_general_ci	16.0 KIB	-
measurement	Browse Structure Search Insert Empty Drop	8	InnoDB	utf8_general_ci	16.0 KIB	-
muscle	Browse Structure Search Insert Empty Drop	23	InnoDB	utf8_general_ci	16.0 KIB	-
url	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8_general_ci	16.0 KIB	-
15 tables	Sum	5,675	InnoDB	utf8_general_ci	496.0 KIB	0 B

Figure 3.22 Exercise data populated

(Figures 3.21 and 3.22) confirm the exercise convert script has been successful. As you can see there are now 5,675 rows within the database. Now I will conduct 4 searches to test whether the business logic has been programmed to the correct tables.

Search for exercises

Muscle

Category

Level

Equipment

Abs

Cancel

Submit

Figure 3.23 Muscle Abs search

(Figure 3.23) show I have selected abs as my muscle type.

Search results:-

Id	Exercises	Action
1	ab roller	Detail
4	advanced kettlebell windmill	Detail
8	alternate heel touchers	Detail
29	ab crunch machine	Detail
41	barbell ab rollout	Detail
42	barbell ab rollout - on knees	Detail
56	barbell rollout from bench	Detail
61	barbell side bend	Detail
81	bent press	Detail
84	bent-knee hip raise	Detail
89	body-up	Detail
94	bosu ball cable crunch with side bends	Detail
95	bottoms up	Detail
105	butt-ups	Detail
109	cable crunch	Detail

Figure 3.24 Muscle Abs result

(Figure 3.24) display all exercises related to abs; this confirm the programming is correct.

TM470: AdminNew Search

Exercise : (1) , ab roller

Muscle	Category	level	Equipment
Abs	Strength	Intermediate	Other

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Figure 3.25 Ab roller detail

(Figure 3.25) showcase the ab roller exercise the detail. This includes, its muscle type, which is abs, the category which is strength, the level is considered intermediate, and the equipment is classified as other.

Once the database was populated, I checked to make sure all the information collected were present, performed stress testing to ensure the relationship with the components were correct.

I checked this against the original spreadsheet. As recommended by my tutor, I used phpMyAdmin to check the data in the database against the data on the spreadsheet.

Checked the components and amended some of the spelling mistakes.

Made a backup copy, this will be my working back up which I will revert to in case of issues. I backed up the data using phpMyAdmin as recommended by my tutor ([Appendix 7.7](#)).

Used the export function, exported to a folder, named it backup. In the event of failure, I have a backup version I can revert to. And the way to retrieve the backup is to import.

When the times comes to refresh system, I will run the script; I will then have a fresh updated database.

In the short term I will keep the convert folder, as soon as I go live, I will remove both the convert folder and the install folder due to this becoming a security issue. (TM352) showcased the importance of minimising data loss and authentication.

Unfortunately, due to deadlines and the amount of data in each row I couldn't check every exercise detail entry to ensure they were in the correct category. If I were to do

this again, I would amend the script to install 100 exercises at a time and check each component to make sure it is correct. Or I would reduce the size of the dataset, whilst gradually adding more after testing. For more information on the testing procedure please see [\(Appendix 7.1 14/07 – 16/08\)](#).

3.5 Maintenance

Once the project was completed, I asked for feedback from 2 users. Overall, they were satisfied with the speed. They appreciated the variety of exercises within the search engine, it helps keep sessions fresh. The other user told me he wanted to do an upper body workout, was so impressed with the variety he quickly produced a workout plan using the exercises from my search engine, which he is currently using now. Both users provided great feedback on the user experience. One user said he would appreciate if you could make a custom workout plan on the site. The other wanted better user interactions such as images, videos, a general description of each exercise, and a step-by-step guide in how to execute them. I took the feedback onboard, whilst also acknowledging that this project is a fragment of a much larger project. This is something I would consider implementing in the future. However, that was considered out of the scope.

3.6 Risk analysis

Assumption:

After development, this system will be installed over the internet for general use. Note that the maximum movement of data is from the server to the client. User data is kept to a minimum, and personal information is never retrieved from the client.

Risks review areas:

Server
Client
Testing
Loss of data

Server

1. Operating system on the server could be a potential risk. There are setup variables for the OS that will need to be correctly installed otherwise it could be cause a potential threat. The operating system will need constant upgrading to ensure the server remains secure. Otherwise, the end user may be subject to security vulnerabilities.

Security updates should be kept up to-date. Virus checkers must be used, and security set up to minimise misuse.

2. Web server could be a potential risk. Correct set-up parameters on the Web server. e.g., download/upload sizes, Manage Denial-of-Service (DOS) attacks, maximum number of requests, prevent file type uploads e.g., JavaScript's.

3. PHP server is updated regularly with the latest security patches.

4. MySQL server is also kept updated with security patches. Data is encrypted where required. Backup of data kept off site.

These services are purchased, and one would have to assume that the service provider would keep these services up to date.

Not adhering to the above will potentially increase risks.

Client

This is a browser-based application. Send well-formed HTML pages to maximise speed and minimise loads.

JavaScript will be kept to a minimum to avoid disruption across different browsers.

Code will need to be tested on multiple browsers before publishing to ensure support, which will impact project deadlines.

Testing

All software should be thoroughly, thoughtfully tested before implementation.

Faulty software causes data corruption, exposes the software to abuse, allows unwanted access routes.

A good set of testing scripts should be used to validate the software. All input values

Must be validated.

Good testing minimises risks.

Loss of data

To minimise loss of data, take regular backups. Using the son-father-grandfather model. This will allow to hold 3 period backups.

Keep remote backups too.

3.7 Legal social, ethical and professional issues

The UK GDPR sets out seven key principles:

- Lawfulness, fairness and transparency.
- Purpose limitation.
- Data minimisation.
- Accuracy.
- Storage limitation.
- Integrity and confidentiality (security).
- Accountability.

The project is aimed at providing a service to the end user, it does not require personal information. The UK GDPR sections it will touch on is integrity, accuracy, confidentiality and accountability.

To start with, a general disclaimer has been provided prior to initial use. This covers the general sections. It clearly outlines the end user is using the platform at their own

risk. We would not be held accountable, should the experience result in unforeseen circumstances. A disclaimer will help protect the business from potential legal claims, should implications arise from the advice given.

3.7.1.1 Web accessibility

Incorporating Web accessibility standards will be important, we must assume users of different abilities will want to access the platform. This will be achieved by including a range of communication methods such as text, audio, pictures, together with a brief description. The webpage should contain a recognisable font type, combined with an acceptable font size, which will be easy to read without disrupting the layout of the page. The web page should contain contrasting colours, to help with separation, and make the information and interaction easier to identify.

3.7.1.2 Privacy Policy

The webpage should contain a privacy policy page. This should cover the ownership of the website, how the webpage collects and handles the data from its users, what the policy covers, the users' rights, and lastly where the data is stored. It should describe whether the information is kept confidential, or whether its shared and sold to private entities.

3.7.1.3 Professional certification

The web page should contain a professional representation of the knowledge provided on the webpage. This is important for professional conduct. Users are more likely to feel confident using a platform which clearly states its professional certification. This information would be highlighted in the footer of the webpage.

I believe I have a duty of responsibility to ensure the information provided on the platform is accurate. Errors in business logic, or poor database validation could lead to serious consequences. For example, my web page could contain an exercise aimed at experts, however a programming error could recommend this exercise for a beginner instead. An error such as this could lead to a user attempting an exercise too advanced for their level. This may lead to life changing injuries, exposing the business to lawsuits.

This will attract a negative reputation, due to the platform's foundation supposedly being built on providing accurate information.

There is a possibility of bias in the system. For example, the data could be based on a male user, however there's a strong possibility women would want to use the platform. It would need to consider different levels of physicality, such as height, weight and other physiological features. In this case, I don't believe this is something I would need to implement as the platform only recommend various exercise types. It also provides a recommended level, which the user would have to honestly reflect on what they are and aren't capable of.

If I were to broaden the scope of this project by recommending ideal rep ranges, or the amount of weight to lift, I would need to factor in all the features as some people will be more genetically able than others.

Therefore, it's important to ensure the data collected is accurate and is populated to the correct tables.

4 Review

4.1 Current stage of project work

Overall, I am satisfied with the current stage of development however, there were several challenges experienced along the way. I did have trouble setting up the initial working environment. On a previous module I installed my local server, via virtual box powered by Ubuntu. However, complications arose due to the fact my OS is now Mac OS. I previously used Windows and experienced no issues. Once installed the virtual box would stop responding continuously. I didn't feel secure using this environment, I feared I may end up losing progress as a result of data corruption. Thankfully, once I discovered MAMP I haven't looked back.

My decision to withdraw my initial UI design was a difficult decision to make. My Designer thoughts was willing me to seek the challenge of designing a more interactive UI. However, my Project management thought process considered a simpler design, to comprehend the business logic phase, which would develop into a difficult phase. For the sake of my limited experience in Back-end development, I didn't want to compromise myself, by attempting business logic for a UI, which contain far too many interactions that I could handle within the time constraints provided.

My tutor was proved correct in identifying data population as my biggest challenge; therefore, adopting a simpler UI proved the correct decision. If more time was provided, I believe I would have undertaken my initial design, and prepared a contingency plan of resorting back to a simpler design in case circumstances didn't go the way I planned.

Populating the database appeared to be an interesting challenge. Thankfully I could rely on the Back-end developer for advice. Without his input, I'm not sure I would have had the confidence to generate my own population script. (Php.net) proved decisive for my learning, there were many days where I had to sacrifice time away from the project, in order to digest more complex techniques such as the arrays. (M250) provided a whole section dedicated to data structures such as arrays, Lists and maps. This contributed positively towards overall the speed of the application.

Imitative had to be used when scheduling meet ups with the stakeholders. I anticipated cancelations and postponements, for this reason I began exploring the task beforehand. For example, I organised meet up with the UX/UI designer to improve my knowledge on Figma. Unfortunately, that meeting was postponed. The deadline was approaching fast, I knew I couldn't risk waiting for the date the meeting was rescheduled for. Therefore, I took it upon myself to learn as much of the documentation myself, along with helpful tutorials I managed to find online. This

input enabled me to finish the prototype on time. By the time I attended the next meeting, it was more a case of checking over the design to ensure it was compliant with W3C standards.

There were difficulties coming up with a design that would be easy for people from all levels to use. I felt I based a lot of my decision making on my abilities without factoring in other people's limits. If I were to do this again, I would create a workshop, and encourage people of different abilities to attend, in order to assess and base my decision making on their interactions with the design. However, I understand this wasn't necessary a requirement due to the size of this project.

The database phase went better than I expected, I didn't realise there was a difference between MySQL and MySQLi. I also didn't realise php code can be initialised procedurally and object orientated. Thankfully (M250) exposed me to the concept of object orientated programming.

4.2 Relevant Stakeholders/ roles in the project

4.2.1 My Roles

I took on various roles throughout the project, they were the following:

- Project Manager
- Developer
- Designer
- Tester
- Researcher

As Project manager, it was my obligation to assemble, and administer the necessary requirements into an appropriate application, within the scope of my project. I identified three key areas which required specialist expertise. For this reason, I opted to include four consultants to assist me with specialist knowledge in support of the project completion.

As my project required an application server, I had to expand on my current understanding of business logic, this was an important element in how the user interface interacts with the database. Therefore, I liaised with A Back-end Developer. I relied on his data population recommendations, and tips on creating algorithms. (TM352) provided me with a basic insight on how servers work. I had to expand on this knowledge by producing a set of rules which would validate and extract the correct information that the end user requests. I didn't over rely on his consultation, due to the fact he lives a very busy life and wouldn't always be available when required. For this reason, I continued to learn and elevate my own skill set whilst seeking his advice along the way.

In conjunction with the server, my project required a database server to store the data. (TM352) equipped me with an understanding on how script languages such as PHP are used to extract data from the database. Once again, I followed up with the back-end developer for advice on the most suitable database design approach,

along with suitable techniques to ensure data requests are sent and received in a timely manner.

A clear, simple user-friendly UI was required. Although (TT284) equipped me with an introduction on web accessibility standards. I wanted to follow this up by including it within my own design. To ensure this was carried out, I reached out to a professional UX/UI Designer to discuss design philosophies, and how to get the best out of Bootstrap. I only reached out when essential, as I needed to take his lifestyle into consideration. This helped reduce the risk of missing deadlines as a result of waiting for recommendations.

My project required a collection of suitable exercises. I have prior knowledge being a gym user myself however, I accept it wasn't enough. I needed to broaden my current level of knowledge. Therefore, I organised regular meet ups with A sports scientist and a personal trainer. This phase was easier to manage as a result of my hands on experience in this sector.

Zoom proved to be the fundamental method of communication with all stakeholders. Due to conflicting schedules Zoom provided great flexibility and helped reduce the influence of external factors such as travel time, work and social commitments. I identified the business logic and data population as potential risks due to time constraints; I chose to prioritise these subjects to ensure deadlines were met.

4.2.2 Review of Chosen Software programs

4.2.2.1 MAMP

Used as my local server environment. Proved to be very easy to set up, proved helpful during the development, and the testing of the application. In the future as I take on more challenges, this environment will prove useful for testing applications before the go live.

4.2.2.2 Whimsical

(Whimsical. 2021), as discussed with the UX/UI designer ([appendix 7.3.2](#)) I used Whimsical to convert my initial ideas into computer form. It proved to be an easy simple program to use, Overall, it was very user friendly and easy to navigate through. I did find the elements quite limited; the colour palette was limited. The design options were also limited. Although some may opt to use this platform to produce finalised designs, I don't feel there was enough options to generate a prototype, it proved to be a great tool for brainstorming purposes only, which was what it was used for.

4.2.2.3 Dbdesigner.net

Based on my research, this was recommended as the number one tool for database design. The platform proved helpful in showcasing a visual representation of how the data relate with one another. I had to opt for the premium version to represent the

relationship with each table. The free version only allowed you to create the table and rows but not to link them.

4.2.2.4 Lucidchart

(Lucidchart. 2021), Based on my own research, Lucidchart proved to be the ideal platform to produce the diagrams for my project. It was very easy to use. The only slight issue was, due to the fact I was using the free version, it restricted you to 2 diagrams at a time. For this reason, I had to remove diagrams before I could produce new ones. I had to be sure I was happy each diagram before saving it as a pdf; I wouldn't be able to go back to it for editing purposes in the future. I would use this platform for the foreseeable future however, I would sign up to the full version.

4.2.2.5 Figma

(The Power of Figma as a Design Tool, 2021), As recommended by the UX/I Designer ([appendix 7.3.2](#)), Figma was the design tool I used to showcase a real-world example of what my interface was going to look like. Although it's a chargeable service, the free version contained enough resources for me to complete the prototype. In comparison to Whimsical, there were better design options, whilst still being user friendly. It was straightforward to learn for what I wanted to achieve. I was happy with how the prototype came out; I would consider using this in the foreseeable future.

4.2.2.6 PHP

(PHP – Hosting, 2021), PHP proved to be the preferred script language to use in conjunction with MySQL. This was recommended by the back-end developer ([Appendix 7.3.3](#)). It's a widely used general-purpose language, and contains interpreters that are freely available. Python was initially a consideration, however its drawbacks such as speed limitations, poor performance within browsers and design restrictions made PHP the more viable option. I have previous experience using PHP thanks to (TT284), this swayed my decision. The support documentation was very helpful, and easy to follow when required. It complimented MySQL very well.

4.2.2.7 MySQL

(U, J. and U, J., 2021), Based on my interview with the back-end developer MySQL was chosen as the relational database management system. It's an open-source product which is proven to be reliable, fast and simple to use. (TT284) provided basic CRUD operations using SQL, which proved useful. MongoDB was considered, however, due to its NoSQL nature, along with a lack of support for ACID, MySQL was the preferred option. Once the project is complete, I have no plans to expand on the data being implemented, there is no reason to opt for a NoSQL database for that reason.

4.2.2.8 *phpMyAdmin*

(Contributors, p., 2021) used in conjunction with PHP, for testing and population methods. Proved to be a useful tool, I was able to run and test the application whilst checking each table to make sure the population script was working correctly. Adminer was also recommended by my tutor, even though phpMyAdmin proved useful I would try Adminer next just to compare them to identify whether one was the better choice depending on the chosen project.

4.2.2.9 *Bootstrap*

(Rocheleau, 2021) outline a list of reputable front end Web UI kits. Bootstrap is the most popular framework available, despite not being featured in the top 10. Bootstrap contain reliable documentation, unmatched community support. Familiarity proved to be the deciding factor, my previous experience with the framework meant I was able to use with ease. It's a great framework, maybe I would consider experimenting with other UI kits from the list in the future however, Bootstrap served its purpose well for my project.

4.3 Project Management

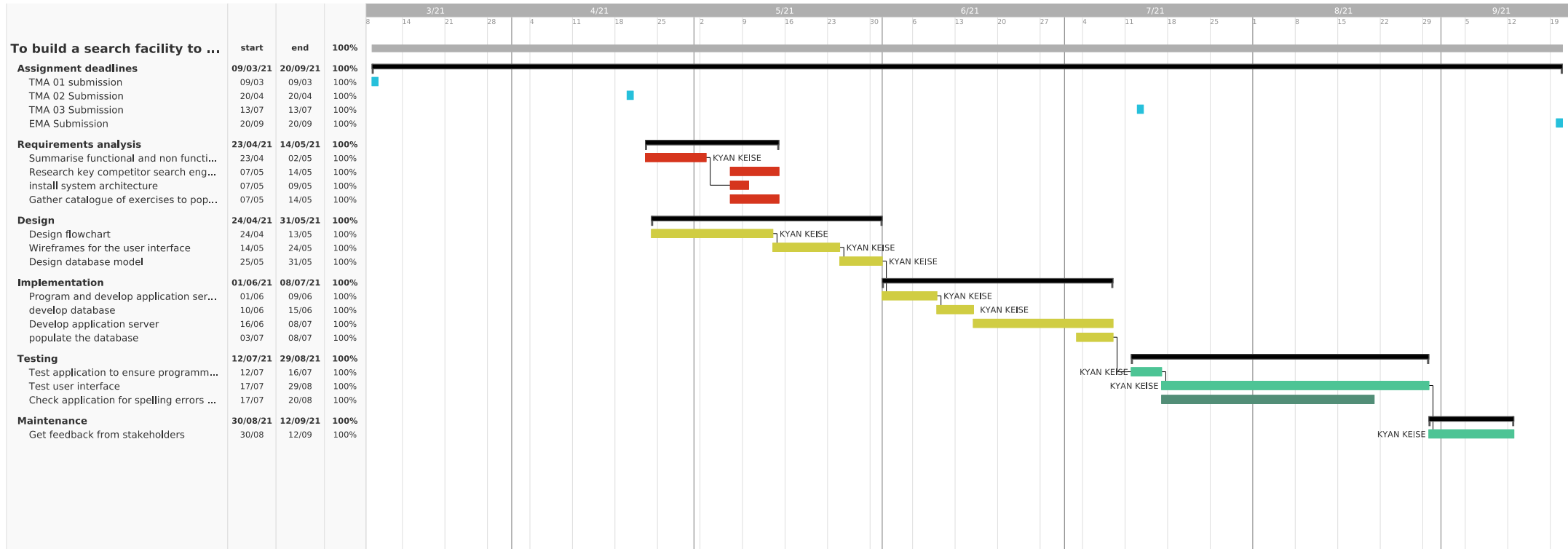


Figure 4.1 Project schedule

Overall, I am happy with my chosen lifecycle model however, I felt at times the sequential approach was quite rigid, in comparison to more flexible methodologies such as Agile. The Waterfall Methodology proved to be the best option, taking the size of my project into consideration. The end goal was clear from the start, its linear sequential approach made progress easier to track. However, saving development to a later phase was quite uncomfortable, the uncertainty on whether it was going to be work, or be fit for purpose didn't sit with me. In my opinion Agile would have been better specifically in these circumstances, its flexibility would serve better for trial and error. However, Waterfalls linear approach helped when identifying the requirements. It gave a good indicator on how the project was going to turn out before the development stage.

I don't think I would have integrated Waterfall had I been developing the full scope of the project. As the project becomes more complex, I don't feel this approach would be the most suitable. An element of flexibility and adaptability would be welcomed, especially when more people are involved in the project.

I was happy with the Gantt chart (Prod.teamgantt.com. 2021). The platform helped keep the project on track. In the end I managed to complete the project before the projected deadline, I feel this platform was key in helping me achieve that. It was simple to use once each milestone was inserted, the platform contained a checklist, together with notifications via email, constantly reminding me of any fast-approaching deadlines. Once each task was complete, I would simply tick each task on the checklist. The progress bar on the chart would gradually increase after each progression, which helped with motivation.

Overall, I would say the given the size and the simplicity of my project I do feel this was the correct model to follow.

4.4 Personal development review

Overall, I am very satisfied with how my project has turned out. Firstly, I am happy with how I've learned about the fundamentals required to build a search engine. I've learnt so much about how the front-end and the back-end correlate with one another, and how both components are co-dependant on each other to co-exist.

I feel I have a much greater understanding on the fundamental requirements of a development project, from research, to implementation, testing, along with the soft skills required to manage and interact with other stakeholders.

I contrast this to my attitude towards the beginning of the project. I would describe my thought process as design orientated, without a real understanding on how the back-end powers the front end, in order to provide the information requested from the user. Of course, I was aware of the back-end existence, but I learned a lot about how the server, the application and the database communicate in order to provide the requested information. The backend is where I believe I've learnt a tremendous amount whilst completing this project. My naivety at the beginning could possibly explain why my first idea was seen as too ambitious ([Appendix 7.7](#)). Thanks to my

tutors' feedback, I condensed my idea so that it can be managed within the time frames allocated, whilst still demonstrating a diverse range of skills.

From my perspective, my limited knowledge on the requirements did affect my progress at times. There were times where each requirement felt somewhat overwhelming, and this brought on a sense of panic. I managed to overcome this by scheduling time out every other day, to spend as much time reading the sources I found, whilst trying to understand the thinking process behind each philosophy. This helped gauge a better understanding on what was expected throughout. This was the method I resorted to using throughout the project which paid off tremendously.

The interactions with my chosen stakeholders have improved my confidence in communicating with people in the IT sector. IT is a complex subject, and sometimes it can be difficult to express what you intended without sounding wet behind the ears. My interviews in the early stages ([Appendix 7.3](#)) left me feeling overwhelmed with how much I didn't know, but at the same time I relished the challenge. I knew I was going to get a lot out of this and was keen gain familiarity in development. This the field I am keen on pursuing career wise.

The interactions were important, it helped me understand how much emphasis is placed on the planning stage rather than the implementation. Therefore, I wanted to ensure I had an idea that I could develop organically from the start, which meant I was able to build on my understanding through each TMA, which paid dividend later in the project. There were times where scheduled meetings had to be postponed at short notice, I didn't allow this to influence meeting project deadlines. I filled the gap by drawing inspiration from independent study and research.

I believe I handled time management aspect of the project superbly. None of the major deadlines were missed, I put this down to being accustomed to independent study thanks to the Open University. Throughout my studies, good time management has enabled me to manage time between study, working full time, along with social/family endeavours. There has been a lot of sacrifice along the way, which I feel was worth it in the end.

There were elements of confusion the role I should be playing in this project earlier on. It was made clear from by tutor, that the report carries most of the marks rather than project itself. I sought clarification on whether I was acting as the as Project Manager, in terms of managing project timelines, whilst outsourcing the development. Or whether I was acting as the Developer, who would prioritise the hands-on aspect of the project, whilst evaluating what I thought went well and what didn't. Thankfully this enquiry was cleared up by my tutor who confirmed I would be operating as both the Project manager and the Developer.

There were elements throughout the project where I took on board previous experience gained in the previous modules notably (TM352). During the requirements phase I recalled dealing with the functional and non-functional requirements, which helped me identify the requirements. Also, the wireframe/prototype section was based on a TMA assignment I completed within the module. This module also exposed me to PHP and MySQL, however I do recall

struggling to get to grips how to program the back-end functionality. This is what inspired me produce a project demonstrating this skill set.

If I were to do the requirements phase again, I would spend a lot of time around potential end users, I would set up workshops, conduct interviews, ask them to fill out questionnaires, so that I could gather as much information, that I could apply into providing a product which match their needs. I realised extensive feedback is the difference between a successful and unsuccessful product, they will be the ones making use of it and their thoughts are important.

Throughout the implementation phase, apart from the design stage there were times documented throughout [\(Appendix 7.1\)](#) where I felt overwhelmed once again. I was exposed to practises which I felt my experience was limited. My resilience was severely tested, there were days where I could spend 3- 4 hours and not write a single line of code at the end of it. I had to conduct a lot of independent study to bridge the knowledge, with the techniques to ensure practises such as data validation made sure the data sample was clean, accurate and not duplicated. Also, to ensure each script carried out the correct instruction.

This made for a very fun challenge indeed. I must thank the back-end developer as his expertise throughout paid dividend, especially when implementing arrays. (M250) exposed me to using arrays which helped. Although Java was the programming language used, the fundamentals remained similar. However, I only recall using arrays at a basic level, not implementing it in a live project. Using arrays throughout my project really helped me understand the power of how large amounts of data can be transmitted within a single variable, which drastically improved processing times. Throughout this phase I used an array course on Udemy to add to my knowledge.

Creating the database provide to be very insightful. Learning about the purpose they serve, how data can be manipulated and stored was very helpful. This was the first database I designed for my own purpose. Defining the database credentials proved to be straight forward. Remembering the “CRUD” reference helped when manipulating the database. The documentation for MySQL proved helpful when referencing these statements. I’m also pleased with the way I created my database, the interface I designed can be applied to other projects. I can make slight amendments for it to fit the requirements of that project.

If I were to produce a similar project again, for starters, I would install the whole application on a remote server and provide access to the developers/ users. I would produce an app, in order to provide compatibility for mobile devices. I would refine the UI and UX tools, to get it to a much more polished presentation. I would also try to personalise the experience, this would include collecting usage data for analysis, and from this information I would be able to provide a better experience for the end user. I would include detailed information on each exercise. This would include images, a description, a link to video tutorial, and lastly a review system, rating how efficient each exercise based on user input. The other area to investigate further would be commercialising the application. This would cover the running costs and return in investment.

If I were to do this again, I wouldn't necessarily make any changes to the database itself, however, I would try a different concept for learning purposes. I used the bottom-up approach, and I would be interested to see how the top- bottom approach differs, in order to analyse the benefits and drawbacks in comparison. I would also explore other database management systems such as mongoDB. It would be interesting to see to see how a NoSQL would compare to SQL database. This of course would be dependent on the size, and the requirements of the project.

I would revamp the testing phase. I had to shorten the process in order to give me enough time to produce the report. Although I was able to test most of the data, it would be better to test the whole data sample. If I were to do this again, I would implement a test cycle, which would include unit testing to make sure all components were operating correctly. Integration testing would be the next phase, to measure how quickly the system presented the information. Stress testing would occur next, to assess how it would perform in unfavourable conditions, such as locations with poor reception, or whilst the user is on the move. This would analyse the fluctuations in performance. A beta test would be the final phase, a small amount of people would be brought in to test the application in a real- time environment. The feedback would be taken onboard and integrated until the product launch.

Throughout the project, I feel I've have made huge gains in several areas. Firstly, my communication skills have improved as a result of liaising with stakeholders of different levels. My listening skills have improved, taking on feedback and applying it really helped shape the project. My time management skills have improved, due to the fact I've had to work smart, juggle learning new techniques, with the implementation of the project. Whilst having to manage this around my work, social life, plus another TMA module. Discipline was required to ensure deadlines were completed on time. My programming skills have improved drastically, due to applying what I've learned in past to a real-world project. The back-end development proved insightful, and has given me an in depth understanding, in how the software communicate with each other to shape the Web.

I feel my documentation skills have improved, when I look back at previous modules, my lack of note taking made it difficult to refer to or understand the purpose of the program. I made sure my note taking was detailed enough, so when I revert to it months down the line, I can instantly pick up where I left off. Working smart proved useful. Taking advantage of code re-use helped limit time spent on repetitive tasks. Much of the scripts were similar, just with different variable names. Using code editor tools such as search and replace, this meant I could replace all variable with the click of a button, which helped keep the project schedule on time.

Accuracy and testing were other areas I feel I've improved on. Previously I never properly acknowledged the importance of testing and accuracy. These are methods I will take into other projects, as ensuring accuracy will help minimise false information, which would also limit potential legal issues in case of inaccurate information.

In order to extend this project into a fully rounded application. I would need to expand on my communication skills, by developing my listening skills to gather as much user feedback as possible. I will be interacting with people from all walks of life

therefore, I would need to improve my confidence on presenting complex information. I imagine the workload would require a small team of developers would be required to complete the full project scope. Therefore, my project management skills would need to improve to manage the complexities of contrasting personalities, strengths and weaknesses.

Throughout my time on this project, I realised that in order to get the best out of my abilities, I must have a detailed understanding on the fundamentals, and why I am doing it. There are times in the past where I've completed short courses, or previous modules, and found myself carrying out tasks without a full understanding on why I'm doing it. Once I have a solid understanding, I must analyse the best techniques needed to complete the task, using resources such as documentation to seek better ways at completing the activity. This is an approach I look forward to taking with me into various other projects I will be involved in.

Lastly, I would spend more time on each entity by getting to know them better. For example, exploring the benefits and limitation of the operating systems, find out more about how webs servers work depending on the size of the project, and explore other database management systems. I plan to do this in the future. I would also check in more frequently with my tutor to ensure I'm on the right track, as emailing my initial thoughts really helped shape the direction of my project. I will also ask for more guidance on things that could be improved.

5 Epilogue

Nothing further has been done to complete this project. However, I have decided to form a team of 4, who will be tasked with developing a fully functional health and well-being App. The search engine will be one of many entities which will be implemented in the App. I look forward to what the future holds.

Word count: 11449

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7 Appendices

7.1 Appendix - Project Log

Date	Session no.	Time spent	Work	Problems	Comments	Next work planned
25 th January	1	1 hour	Reading through TM470 resources	First time producing a project like this a lot of information to digest scope seem so broad difficult to distinguish what the requirements	After reading through TMA 01 none of it was really sinking in yet. Quite a lot to take in. I Realised I need to read over the TMA again and read the other project resources	Re read TMA again
27 th Jan	2	1 hour	Read 3.1 preparation and planning	Need to read more into lifecycle models to gain a better understanding	Have a slightly better understanding on what's required in this section. From my understanding this is the section where I produce my proposal on what I intend to do and details on how I'm going to achieve this.	Read choosing a lifecycle model
28 th Jan	3	1.5 hours	Read choosing a lifecycle model	Need to make sure project choice is concrete as its difficult to apply a life cycle model	Will need to revisit this once I'm sure what my project will entail so far, I like the sound of the iteration Lifecycle but once again it will depend on whether its suitable for my chosen project.	Produce first proposal then re-read again
29 th Jan	4	1 hour	Read 3.2 project work completed	n/a	From my understanding this is the section where I need to confirm the sources I will be using in the project as well as	Read 3.3

					the first stages developing my initial ideas for my project	
30 th Jan	5	30 mins	Read 3.3 review and reflection	n/a	From my understanding this section I will evaluate my performance so far issues I've encountered and how I would do things differently if I had to do it again.	Produce my first proposal
01st Feb	6	2 hours	First proposal	n/a	Written out a proposal on my first initial idea sent to tutor to provide feedback on whether I'm on the right track. I want my project to be as ambitious as I can I have a massive interest in cars, and I think it will be a great topic to keep me motivated throughout.	Await feedback from tutor – follow up on feedback
02/02	7	1 hour	Received feedback from tutor	The project was branded over ambitious I have misunderstood the requirements I need to look into the scope to come up with a project with a realistic scope where I can still show multiple skill sets.	Received feedback took onboard the feedback realised I may have been over ambitious on the first proposal now understanding the report is the priority rather than the project itself will re evaluate	Go back and re-read TMA 01
03/02	8	1 hour	Read TMA 01	N/a	My tutor's suggestion on focusing on a vertical slice of a larger project will. Be my direction. That way I can show a particular section which demonstrates multiple skill sets	Think of other ideas

03/02	9	3 hours	Research for inspirations	n/a	<p>Came across a few fitness apps on my phone. Looked at an app called Thenx. Good app but there were no search options to narrow you're search to a particular muscle group or a category for your experience levels. The search at times is clunky. Some of the exercises branded beginner are not what I would consider beginner level, was too advanced for a beginner.</p> <p>Thought of the idea of developing a search engine for Gym users who can search for exercises depending on their level of experience.</p>	Write a second proposal
03/02	10	1 hour	Produced 2 nd Proposal based on a fitness App	Need to make sure the project is challenging enough whilst also making sure it can fit in with the deadlines of the other TMAs without it being overwhelming.	Written out my second proposal, I want it to be based on fitness as its one of my other passions. looking over it again its looks as if the size may still be too ambitious for the project I will need to go away and think of a segment of my idea that I can focus in on which also shows a diverse range of skills.	Refine proposal
04/02	11	2 hours	Refined 2 nd proposal	Changed idea to a search facility web page want to focus in on the	Thought of the idea on zooming into a particular feature of the web page. I could focus on	Wait for tutor's response

				search aspect of the exercises as my scope	chose search facility as I can showcase Design, front end and back-end skills	
04/02	12	1 hour	Read TMA requirements again	None	Noted first initial suggestions on the title of the project the scope requirement etc.	Research documents used to present projects
04/02	-	30 mins	Briefly researched academic report	n/a	Researched Academic report Just exploring ways, I can structure my report before starting	Look into SRS specification
05/02	-	1.5 hours	Researched SRS specification	No idea how I go about structuring all the requirements into one document	Started looking into methods I can use to present my project started looking into the SRS document as a potential method. Can see its clear with the synopsis at the start followed by the intended audience, scope as well as an overview on what I will build.	Apply this to my proposal draft
07/02	13	10 mins	Seek clarification on word count	Need clarification on this as logbook alone may be more then 300 words	Asked tutor to confirm whether Log counts towards 3000-word count limit Wanted clarification on this as if this is the case, I will need to be worry on how much to include in this log if this is the case. If it's not the case, then perfect I want to be able to include as much research in my	Expand on my log

					log/appendix as possible to show my journey - Tutor came back to me confirmed I can include the log as my appendices	
08/02	14	30 mins	Read the TMA brief	n/a	Making sure my proposal will tick all the requirements	
09/02	-	1 hour	Reading Lifecycle model	n/a	Now I'm leaning towards either the iterative waterfall or the star model. I like the idea of refining and repeating activities until significant progress is made. The Star model is also a concept I'm interested in as like the idea of evaluating a task before moving onto the next.	Continue with proposal
10/02	15	30 mins	Read TMA 01 Requirements	n/a	Make sure I'm on the right track	Go over TMA again
11/02	-	10 mins	Read TMA 01 again	n/a	Make sure I'm on the right track	
11/02	-	1 hour	Read over lifecycle models again	Previous choice might prove too complex for the project I've chosen I need a lifecycle model that follows a simple process	After looking again I'm feeling the waterfall cycle may be best suited as its more suitable due to the scope and simplicity of the project	Continue with proposal
12/02	16	2 hours	Deciding on my project proposal	n/a	I want to create a search facility for gym users to use This is the idea I'm going with. Not only is it based on an industry I'm	Finish proposal

					passionate about. It would be a good platform for gym users just starting out to expose them to some exercises they can incorporate. Or even more experienced users who can seek exercises which will enable them to progress from their current level.	
13/02	17	3 hours	Making a start on the TMA 01	n/a	Made a start on project going to start working alongside table 3.1 to make sure I've ticked off the requirements I will start with a title brief description on what the product will do as well as how it will benefit the user.	
17/02	18	2 hours	Completed Synopsis task and resources required	n/a	I want to find better ways at representing my schedule going to start with Gantt charts. I remember studying this as a form of management tool during my school days	Research Gantt charts
19/02	19	1.5 hours	Create suitable Gantt chart to map out timeframes	I struggled to create a Gantt in excel I couldn't represent my task list in the way I wanted. Plus, I can see it causing time wasting when refining and confirming task completions moving forward. I want to find free a platform in which	Opted for Gantt chart as it's the preferred tool project managers would opt for working in waterfall	Find a Gantt chart platform online

				I can use to create Gantt chart with a task list I can check off daily		
19/02	-	1 hours	Research suitable Gantt chart template	n/a	Began searching for a template I can use to produce a detailed chart will also include a to do list to tick off completed tasks as I progress. Came across TeamGantt simple to use and a great way to represent the intended schedule for my project.	Incorporate my task lists into Gantt chart.
19/02	-	1 hour	Complete Gantt chart	n/a	Finished chart selected start date as the 2 nd march I want to start as soon as Karl approves my proposal	Continue with proposal
19/02	20	10 mins	Best ways to evaluate a project	n/a	I wanted to check out the best ways to determine the best way to assess the progress of a project	Complete proposal
20/02	-	1 hour	Sent proposal draft to tutor	n/a	Completed proposal happy with what I've done so far. Awaiting update from tutor to make sure I'm heading in the right direction once I get the green light will conduct my research	Take onboard feedback from tutor
22/02	-	-	Karl (Tutor) approves my proposal	n/a	Taken on board the feedback happy to proceed with this idea will start carrying out research.	Complete the rest of TMA 01
23/02	21	2 hours	Research database concepts	n/a	As a database will be part of my project thought it would be best	Add to sources

					to start carrying out research into good database design principles and the type of database that would be most suited to my project came across the relational database built up of elements and the relationship between them	
23/02	22	1 hours	Research suitable Application servers	n/a	I'm aware of apache but I want an overview on the most suitable application servers I can use came across a website which provides the highest reviews whether the servers free and an overview on each one.	Add to sources
23/02	23	2 hours	Scheduled meeting with personal trainer (Simon/Andy)	-	Organised for the 24 th will carry out some of my own research in the meantime	Research fitness websites
24/02	-	2 hours	Scheduled meeting with personal trainer (Simon)	Meeting was cancelled as Simon had to prioritise a client. Andy was not available either so will have to wait	Spent the time carrying out research on the web and finding reliable sources that would help with exercise selections. Meeting was arranged a short notice so can't really complain plus we still have a lot of time to reschedule. Also thought of a series of questions I want to ask.	Re – schedule meeting with Simon will take place on the 26 th February

24/02	24	10 mins	Scheduled meeting with Back-end developer (Joe)	Due to Joes busy schedule was unable to organise a meeting until next week 03/03	Will prioritise the research on exercises and design in the meantime	Attend meeting
26/02	25	1.5 hours	Personal trainer interview	n/a	<p>Very insightful meeting really gauged a better understanding on what's to be expected. Also realised fitness is more complex than just throwing weight around or running around aimlessly realised you select an exercise sometimes with the assistance of equipment depending on what you aim to achieve whether its endurance strength etc.</p> <p>Made a note of some of the terminologies involved so I have a much better understanding on the different types of exercises and why people select them will investigate the book Simon recommended to me as it will help give me a much better overall understanding</p>	Add finding to TMA 01
26/02	26	3 hours	Research on 3 exercise search engines	Slight issue with my internet connection meant this task was delayed until the end of the day	Want to assess the speed in which the information is found how easy the user interface was and whether the overall	Add findings to TMA 01

					presentation was of a high standard	
27/02	26	5 mins	Scheduled meeting with UX/I designer (Aiden)	-	Meeting has been scheduled for 28/02 – Have come up with a series of questions I want to ask	Attend meeting with Aiden
27/02	-	3 hours	Researching suitable front end UI Frameworks	Lots to choose from didn't realise there were so many.	Already familiar with Bootstrap Its easy to operate and I already had background knowledge on the platform. Found a website which that recommends 10 of the best frameworks for me to consider. Will wait for my meeting with Aiden before making a decision	Add to resources
28/02	27	3 hours split into 2 sessions	Meeting with UX/I Designer (Aiden)	Need to get a better understanding on the design process as well as recommendation on various design kits	<p>No issues with re-scheduling very insightful learned a lot about the design process learned about the double diamond method which is research, synthesis, ideation and implementation also falls in line with my lifecycle choice.</p> <p>Advised to start off by sketching ideas on paper once I'm happy with that I can move towards creating wireframes flowcharts Whimsical as it's a good way to transfer ideas from paper to the computer. Adv once I'm happy with that I Figma was</p>	Add to TMA 01

					recommended for a more refined finish of the design. Recommended Bootstrap for the front-end framework as it's easy to use plus I told him I have previous experience with it.	
01/03	28	10 mins	Slight refinements to TMA 01	-	Changed synopsis to introduction as	Continue TMA 01
03/03	29	3 hours split into 2 sessions	Interview with Back-end developer (Joe)	Realised I will have to take out more time to develop a greater understanding on the concepts there's a lot too it and it's easy to get confused or feel overwhelmed.	Best meeting so far as this is the area, I know the least about compared to the others. Developed a great understanding on how the user interface interacts with the application server and the database. Realised the programming languages are	Continue researching

					<p>used depending on what the server database you use. Also learned about scripting language and the difference in contrast with a programming language.</p> <p>Learned about the concepts of the relational database and how the selected entities relate with one another. Also learned about database design concepts to adhere to.</p> <p>Will carry out research on Apache PHP and MySQL as they were recommended plus they are open source.</p>	
04/03	30	2 hours	<p>Early-stage design ideas</p> <p>Sketch design ideas on paper</p>	n/a	Produced inverted tree diagrams on various layouts for the user interface. Then produced a quick sketch on how it will look visually with all elements added in.	Add to TMA 01
04 /03	-	1 hour	Further research into Application servers and databases	Felt like a lot of information to digest	Continued with my research	Add to resources
05/03	-	1 hour	Research server script languages	Will have to do a lot of researching and practising as I haven't used it in a long time and even then, it was only basic commands	Will be using PHP as my chosen server-side language	Add to resources

05/03	31	1 hour	Further research on databases	Will need to draw out a rough sketch to gauge a better understanding	Conducted further research	Add to TMA 01
05/03	-	1 hour	Draw Database relational sketch		Produced sketch on the identified elements of the database and how they relate.	Add to TMA 01
06/03	-	2 hours	Database relationship chart	N/A	Produced a more detailed database design will await feedback from Karl before proceeding with this	Add to TMA 01
07/03	32	2 hours	Conduct review and reflection	n/a	Completed reflection section on what I've done so far obstacles I've encountered and what I would do differently if I had to do it again	Add to TMA 01
08/03	33	3 hours	Refined TMA 01 before submission	n/a	Went over TMA to refine and make sure I've included everything before submission so tomorrow	Submit TMA 01 tomorrow
08/03	-	-	SUBMITTED TMA 01	-	-	Read TMA 02
09/03	34	1 hour	Read TMA 02	-	Reading over the assignment to get an understanding on what's expected	Read what to submit in more depth make notes
10/03	-	1 hour	Read TMA 02	Unable to really gauge until I receive back feedback as I'm happy with everything now	Read again highly doubt I will make much change as I'm very happy with the direction of the project	Read
11/03	-	1 hour	Read 3.1 preparation and planning	-	First impressions would be to resubmit what I've done with TMA depending on whether I'm happy with it + Karl's feedback	Read 3.2

12/03	-	1 hour	Read 3.2 project work completed	-	Impression I got from this was to add to my initial idea such as references depending on the software, I use + further develop initial user interface design	Read 3.3
13/03	-	1 hour	Read 3.3 Review and reflect	-	Will need to highlight issues with regards to legal social ethical and professional issues and reflect on project so far.	
14/03	35	30 mins	Review schedule timetable	Will need to reassess start date previous selected date too early plan to implement a schedule that will compliment TMA 03 onwards	Change timeline dates to incorporate TMA 03 and EMA	
16/03	36	30 mins	Clarify TMA 02 requirements	Need clarification on whether its 4000 more words or 4000 including what I'm happy to carry over from TMA 0.1	Before I start, I need clarification on whether to treat TMA 01 as a steppingstone to TMA 02 or as a separate project will be quite difficult to expand on project until I've received feedback on TMA 01. Can start looking into legal and ethics beforehand but will email Karl for his opinion	Email Karl
17/03	-		Sent email to Karl	-	-	Await response
18/03	-	30 mins	Received Karl's feedback	Better to wait for TMA feedback in the meantime will investigate other tasks I	Received the email there are things I can do in the meantime I can look at legal issues, produce my next set of	Come up with questions to ask stakeholders.

				can be doing in the meantime	questions with my stakeholders will also look over my project to see if there any obvious adjustments to make.	
18/03	37	30 mins	Made changes to timeline	Been receiving email notifications from Team Gantt to advise my project is running behind schedule	I have a much better understanding on the requirements of the TMAs. At first, I thought the project would start after the proposal but realised TMA 01 and 02 are based more on the planning and ideas stage of the project. I am going to amend the timescales and include the submission dates of the assignment and I will fit my deadlines around that. Also, I've noticed it would be best to fit the bulk of the project in line with TMA 03 as this is a draft of what the EMA will be and I also want the project to end at least a month before the deadline of the EMA.	Include changes in TMA 02
18/03	38	1 hour	Catch up with Aiden (UX/UI Designer)	-	Had a catch up with Aiden this evening he presented me with a presentation on the thinking process of a designer. The key things I learned from this encounter was the thinking process plays are more important role than the solution	Apply process to my design process.

					<p>itself. Understanding the client's problems fully is what's going to allow you provide a suitable design to solve the problem. Aidan introduced me to a design thinking framework a 5-stage model describing the process. Empathize define, ideate prototype and test.</p>	
20/03	39	2 hours	Research on basic overview on how my web page could be impacted by legal social ethical and professional issues	-	<p>Brainstorming scenarios which would impact my project.</p> <p>Risk of injury, responsible for any personal information supplied by users, accessibility, can relate to social issues such as depression, exercise, confidence. Certification helps combat professional issues.</p>	Look into web page issues
20/03	-	1 hour	Research Web accessibility standards	Need to get a better understanding on legal ethical social and professional issues I general before applying it to my project	Found a web page which covers an overview of all issues related to web pages as this will be the foundation of my project, I thought it would be a good place to start. Managed to come across web page accessibility standards. It is based on ensuring a web page can be accessed by as many people as possible and providing designs that are clear and simple enough for most	Research health and fitness legal and ethical issues

					people to use without adjusting whilst also supporting those who don't require adaptations.	
20/03	-	30 mins	Fitness disclaimer – Legal method	-	Can be used as a method to advise users on what precautions to take before trying out exercise program will help exempt responsibility from external issues which might occur.	
20/03	-	30 mins	Professional certification	-	Used to reassure the public the information is provided by an organization with professional credentials	
20/03	-	30 mins	Waiver		May be this would be more applicable for a personal trainer working directly with clients. Can be incorporated on a web site when registering as a user.	
21/03	40	1 hour	Questions for stakeholders revised	I need to have a better understanding on the legal ethical professional issues surrounding web development and fitness	Come up with a few more questions I want to ask stakeholders now I will schedule meetings with them across the next few weeks	Schedule meetings number 2
22/03	41	-	Set up meeting with Aiden Web designer on the 25/03	-	-	Attend meeting on the 25 th
22/03	-	-	Set up meeting with Andy personal trainer on the 30/03	-	-	Attend meeting on the 30 th

23/03	-	-	Set up meeting with Joe Back-end developer on 1 st April	-	-	Attend meeting on the 1 st April
24.03	42	10 mins	Emailed Karl for clarification on legal issues	About to start legal issues that may impact my project unsure on whether I focus on the section I'm producing or whether to factor the whole project as a whole	My project is a slice of a much larger project before I start, I want clarification on whether my response needs to take the full project into consideration or whether I should focus on legal issues within the section I'm focussing on	Await response
25/03	-	-	Received Karl's response have a better understanding of what's expected.	-	-	-
25/03	43	1 hour	Meeting with Aiden	-	Developed a great understanding on how to go about incorporating a design that incorporates accessibility standards. I will take the advice from Aidan and move on to form a more detailed design of the user interface.	Develop user interface design further.
25/03	44	2 hours	Written L,E,S,P document draft	-	Write first draft on how my webpage will acknowledge potential L, E, S, P issues once I've spoken with all three stakeholders will eventually add to it and finish off	Complete document after I've spoken with all stakeholders.
26/03	45	1 hour	Received feedback on TMA 01	First impressions not happy about the result a	Received feedback acknowledged the feedback agree with the feedback will	Email Karl asking to expand on some of

				lot of room for improvement.	<p>now spend a lot of time acknowledging the feedback which will then form TMA 02 I will email Karl asking for tips on some of the suggestions he's made such as academic research and a clear statement on the scope.</p> <p>After reading through feedback did take away positives as it seemed concerns were related more towards organisation of my document rather than what I included. Also, other indicators were to justify certain decisions and elaborate on certain points raised.</p>	the suggestions he's made
26/03	46	1 hour	Refined project title	Taken onboard Karl's advice to shorten the Title. Realised I hadn't included a brief description for my project scope can't believe I didn't include this I may have included it initially then accidentally removed it when trying to meet the word count requirements	All refinements in TMA 02 will be in bold to make it easier to see. I will include Karl's suggestion its short gets to the point and summarises my project nicely.	Continue refining
26/03	-	4 hours	Refine introduction	Will need to email Karl to confirm whether I	Added more in-depth information on what issues my	Continuing refining

				should produce a project scope statement. Also want a better understanding on what to include in terms of ICT issues highlighted in the TMA 02 doc	solution is likely to contribute towards and how my project is likely to lead to favourable results. Made changes to the life cycle model justified why I chose said model and why I didn't opt for the other options instead. For the schedule section included a sentence on how I will measure the progress of the project.	
30/03	47	2 hours	Meeting with Andy – personal trainer	-	Very insightful session with Andy learned more about the various exercises I can incorporate, technical knowledge about how gym users can structure their programmes weekly by targeting different muscle groups depending on what was worked the day before.	-
01/04	48	2 hours	Continue refinements	Felt the need to elaborate on my project choice refining more of the feedback Karl provided.	Continued refining project have the marked assignment side by side trying to look for ways to improve the delivery of my assignment	Continue refining
01/04	49	2 hours	Meeting with Joe – back-end developer	Wanted to ask more questions about application servers and databases	Very constructive session exposed me to design philosophies for database design. Also explained the difference between web servers and application servers and	-

					how they work alongside each other. Also went into a bit of detail about how APIs can be integrated to carry out verification checks on my database. Really helped me understand the fundamentals behind APIs as well.	
04/04	50	5 hours	Research on project information sources	Wanted to find sources I can rely on to help with web accessibility, have a limited understanding on the client server model, also need to expand on my knowledge regarding database verification.	Very constructive was able to read up on all subjects reminded myself of the w3c standards from a previous module so looked at the official website for hints and tips on how to make my user interface accessible. Gained a much better understanding on the client server model as this will form the basis of my project will operate. Also gained an understanding on how I can implement verification which checks the type of data being transferred in the database to make sure it fits the required criteria.	Continue research
05/04	51	2 hours	Research how to filter data in an SQL Database	My web page will filter exercises depending on the user's level of experience need to understand the logic	Learnt about the SELECT, WHERE, AND, OR, IN commands. SELECT determines which columns to select. WHERE is used to extract records that fulfil a	Continue researching database techniques

				used to locate and filter chosen information.	specified condition which will help with my requirements. Learnt WHERE can be used in conjunction with OR. AND operators display a record if all conditions separated by AND are true. The OR operator displays a record if any of the conditions separated by OR is true.	
06/04	52	3 hours	Construct list of exercises	Need to start thinking and researching exercise types to include in my database	Constructed a list of 100 exercises so far. Will send across to Andy or Simon to see if my list so far is enough to cover all muscle groups. Happy with the list so far, I think it covers most of the basic exercises so far which is what I want to prioritise now.	Await response from Andy or Simon – create a category table
06/04	-	2 hours	Create a category level list	Need to categorise the chosen exercises based on the	Used my knowledge gained from Andy to construct a category list which comprise of strength, stretching, cardio, plyometrics, strongman, powerlifting and Olympic lifting	Produce table equipment
07/04	-	1 hours	Create an Equipment table	-	Constructed a list of equipment used in gyms. As I'm a gym user myself didn't require much effort will add to it later if there's other innovative equipment which is relatively new.	Produce a muscle table

07/04	-	1.5 hours	Read and practised SQL commands	Need to see how the statements work with a created database	Experimented on W3schools tests to input the commands to see how it effects the state of the database very interested as I will know what commands are required at a given moment.	Continue practising on W3schools
07/04	-	2 hours	Research local servers	Rather than opting for a remote server thought it would be better to install the server on my own system which will help with testing throughout the development stage.		
08/04	-	2 hours	Create muscle table	Have a limited knowledge on muscle groups other than the obvious types	Combined research with encounters with Andy to construct a basic muscle table happy with it so far but I can improve by asking Andy more about the small less obvious muscles that assist the larger more obvious muscle groups	-
08/04	-	2 hours	Explore Whimsical	Haven't used this software before want to try it out before I begin constructing my design ideas	Played around with the software created random simple designs just to get a feel for the software very simple to use can understand why Aiden recommended this won't struggle when it comes to constructing design flow chart ideas.	Explore other chosen Software packages to get familiar with it
09/04	-	2 hours	Explore Bootstrap	Needed to remind myself how to install the	Other than a few challenges remembering the installation	Explore other chosen

				latest version used the official website	process felt like home updated version not much different than the original used an old design to experiment with the CSS style functions such as changing the style of the buttons, font using HTML to structure the layout. I won't experience any difficulties when it comes to implementing my design. Also experimented with JavaScript functionalities which may come in handy during the validation process.	Software packages to gain familiarity with it
10/04	-	4 hours	Attempt to install Apache server	Encountered a software problem I am using a mac and Apache is available for Linux servers for free will need to investigate installing a virtual box which will then enable me to install ubuntu	Tried to install the oracle virtual box experience issues as my MACOS out of date still Mountain 10.8 and the minimum requirements is Yosemite 2014. Decided I will update my OS to the latest Catalina so there should be no issues been putting off updating this as the download time takes a long time and I don't want it to affect my MacBook's efficiency. Carried out an OS update on an older system before and it never performed the same since.	Leave system to install overnight continue the next day

11/04	-	3 hours	Continue with Virtual box installation	System updated now experiencing security issues	System has been updated feels very responsive. Attempted installation process again apple have blocked installation due to security issues resolution was simple just had to access system preferences and click the unlock button which resolved the issue. Now have Virtual box installed.	Install Ubuntu
11/04	-	1 hour	Create Ubuntu Linux Virtual machine	-	Want to try a LAMP server setup. Simple enough experienced no issues followed a tutorial I found online now I can install Ubuntu on the virtual machine	Continue installation
11/04	-	1 hour	Install Ubuntu	-	All set up and ready to go very straight forward relied on the same tutorial to install on virtual machine. Can now install the apache server.	Install Apache server.
11/04	-	1 hour	Install Apache	-	Installed Apache 2 on ubuntu used the sudo commands followed the steps successfully installed I can now begin working towards setting up my webpage which I will come back to during the application server stage	-
11/04	-	10 mins	Email Karl to clarify my role in this project	Feel a little confused on what my role is in this project. Initially I thought	Emailed Karl for some clarification	Wait for Karl's response

				I was playing the role of the developer by achieving the objective to complete the project to a high standard with an element of a plan and an evaluation but the more I complete in this course the more it seems to resemble the role of the project manager emailed Karl for clarification		
11/04	-	10 min	Received response	-	Much better understanding so in other words I will be wearing all the different hats throughout this project	-
12/04	-	2 hours	Explore Figma	Never used this program want to practise using this before I start my project need to gain more familiarity as I don't want my lack of knowledge on the software to delay my project progress	Can understand why Aiden recommended this program so easy to use I'm really going to enjoy using this program as it's so easy to create real life prototypes which I will be able to see in real time and experiment with which will make my decision making easier	Continue experimenting with Figma
12/04	-	10 mins	Help clarification	Followed up on my email to ask whether I am authorised to see advice from my stakeholders in case I get stuck on some code for example.	Sent email to Karl awaiting response	-

	-	10 mins	Received feedback from Karl	-	Once again helped to clear things up main take away was acknowledge the source of my help should I need it.	-
13/04	-	1.5 hours	Install MySQL	-	I have previous experience installing MySQL will use ubuntu as its easier to install on Linux. Used the MySQL Yum repository took a bit longer than I thought but everything is up and running ready to be used.	-
13/04	-	3 hours	Design first wireframe with initial layout ideas	Proved more of a challenge then I thought relied on some of the layouts of my references might need to amend to find a layout that maintains consistency throughout	Completed my first initial wireframe on whimsical really enjoyed the software can really see ideas take form in a quick frame of time really impressed with my first idea but can see room for improvement	Continue designing layouts
14/04	53	3.5 hours	More research on Web servers	Need to improve my overall knowledge on web servers and how It fits in with	Understand a web server is just a computer where the web content is stored which also respond to the request for web sources. I understand it responds to the client request by sending the file to the client with the requested URL. Also generates a response by invoking a script when communicating with a database.	Research Concurrent approach

					<p>When a client sends a HTTP request for a web page, if the page is found the server will send back to the client with a HTTP response.</p> <p>If the client requests other information this is where the application server steps in. as the web server will make contact with the application server and Database in order to construct a HTTP response.</p> <p>Web server architecture follows two approaches concurrent and single-process event driven approach.</p> <p>Concurrent approach – allows the web server to handle multiple client requests at the same time using a multiple process, multi-threaded, or hybrid approach will do more research on each approach later this week.</p>	
15/04	-	1 hour	Research on Concurrent approach	Need to understand which Architecture is going to be better suited to my project.	Multi – processing: In this a single process (parent process) initiates several single-threaded child processes and distribute	Ask joe to explain the concurrent approach.

				Despite the research not sure I understand it fully will ask Joe if he explain this in more simpler terms.	incoming requests to these child processes. Multi- threaded: Unlike Multi-process, it creates multiple single-threaded process. Hybrid: It is combination of above two approaches. In this approach multiple process are created and each process initiates multiple threads. Each of the threads handles one connection. Using multiple threads in single process results in less load on system resources.	
16/04	-	2 hours	Research phpMyAdmin	I need an open-source software tool to manage the data within my database.	Came across this platform thanks to a suggestion from Karl. Research I've done so far will be perfect for what I require for my database. I will be using MySQL. And my server script language will be PHP, this tool is illegible for MySQL databases, and it's written in php so it will be easy to integrate.	
16/04	-	2 hours	Research Adminer	-	Second administration tool recommended by Karl just by looking at it briefly it appears it	Carry out a comparison on advantages and

					quite similar to phpMyAdmin both written in PHP both support MySQL, both consist of a single file ready to deploy to the target server. Adminer is distributed under the Apache license unsure it really makes a difference from a functional standpoint but could be a good reason to choose it over phpMyAdmin. Will need to do more research on which tool is more suitable for what I need to do.	drawbacks of each before deciding which one to go with.
17/04	54	3 hours	Continue exploring Whimsical and Figma	-	Developed more familiarity with the chosen software packages.	-
18/04	-	1 hour	Read requirements for TMA 03	-	Had a brief read of this not going to go too in depth now as its early days will come back to it once TMA 02 is submitted.	- Read over again after TMA 02 submission
19/04	-	3 hours	Refined TMA a final time	-	Finished up going through all the sections happy with what I have feel ready to submit.	Submit TMA 02
20/04	-	-	TMA 02 Submitted!	-	2 down 2 to go roll on TMA 03	Read TMA 03 assignment
21/04	55	1 hour	Read Structuring styling and editing reports	Haven't written a report as large as this. Will need to carve out a plan from the start on how I'm going to tackle this so that I can maintain a	Decided that before I begin with TMA I will need to plan on the style and the structure haven't finished reading the whole documents yet will continue to read before beginning my project.	Continue reading

				consistent approach throughout.		
22/04	-	-	Rest	-	Taking a day off before I begin my project	-
23/04	-	-	Project Begins	-	-	-
23/04	56	-	Delay starting project	Unable to begin project today need to prioritise submitting an assignment for another course which is going to take up too much of my time submission is the 29 th April will be quite limited in what I can do until then will focus on refining my design.	I am confident on my chosen design choice so it shouldn't take too long to construct my final design	-
23/04	56	1 hour	Researched MAMP	Encountered issues when starting up Ubuntu it worked fine first time round tried to open today kept getting error code which said unable to start correctly, please close application kept getting error codes	Was going to attempt a reinstall again but searched best local servers and came across the MAMP platform had no idea mac had their own version used the LAMP set up on a previous module which was good enough but even then, I experienced some installation issues. Unsure if its due to the operating system. They have their own website environment is free all I must do is hit download set up a htdocs folder as my Root folder. Will consider	-

					this environment when it comes to setting up my local server.	
25/04	58	3 hours	Develop wireframe	Planning to develop 2 versions first will be a more simplified version the other with more features	Began wireframe process initial wireframe needs work will opt for a simpler design due to the fact I don't think I'm going to have enough time to achieve the look of my initial design without sacrificing time to work on the application server.	Continue designing wireframe
26/04	-	3 hours	Continue development of the wireframe	-	Completed simpler design I prefer this design because I want to focus more of my time on creating a suitable data structure and I imagine this is going to take up most of my time. Ticked off on schedule	Decide which wireframe to develop
27/04	-	30 mins	Decided on design	I prefer the look of the original design however considering I have limited time on this project it would make more sense to adopt a simpler design which won't require implementing too many elements as I feel this might reduce the time, I'm able to spend on creating the progress on the data structure.	Happy with my choice from a time management standpoint this design will be straight forward to implement will move on to the prototype phase.	Begin prototype phase

28/04	59	2 hours	Designed prototype	Did felt a bit lost at first regarding the design phase convinced there's a more efficient way to implement my design nevertheless I've managed to complete a respectable design.	Completed first prototype happy with how it looks so far will create a mock-up and add some	Add functionality on mock-up
29/04	60	2 hours	Add functionality to mock-up	-	Implemented some functionality just to see how each page links and interacts together happy that I went for a much simpler approach as I'm already feeling the pressure of meeting the required deadlines	Catch up with Aidan/ decide on suitable ui frameworks
30/04 - 04/05	-		Scheduled time off to visit friends /family for the bank holiday period	-	-	-
04/05	-	30 mins	Read an interesting article about system thinking	-	It highlights what makes a designer great by exploring their awareness to system thinking. And applying that to solve the problem.	-
05/05	-	1 hour	Received TMA 02 feedback	-	Happy with the result however going by the feedback I'm really going to have to work on the presentation. Once I've finished the user interface, I will carry out research and find better ways at presenting my report. As going by the feedback, all the information is there it's just	-

					presenting it in a clear and coherent way	
05/05	61	2 hours	Continued with the mock-up	-	Added in colour, navigation tab a brief description on what each table will contain.	Continue refinement
06/05	62	1 hour	Completed mock-up	Design is quite plain however I am looking at the bigger picture the next sections will be my biggest challenges and making the interface as simple as possible will save me a lot of time when it comes to implementation	Completed the mock-up happy with what I have done so far enjoyed using both whimsical and Figma to bring my design to life. Next, I will do some research on my chosen front-end framework then I will schedule a meeting with Aidan to discuss my findings and seek feedback on my chosen design.	Research front end framework / schedule catch up with Aidan
07/05	63	2 hours	Research front end development tools	-	Bootstrap will be my chosen front-end framework. It makes sense as I've used it often in the past and based on my research earlier, I think it's the best framework to achieve what I've set out. Will speak with Aidan in a couple of days to see what he thinks but to be honest I feel more comfortable going with Bootstrap	
09/05	-	-	Schedule catch up with Aidan	Scheduled for today as I'm running a bit behind schedule but unfortunately Aidan was busy today, so we've	Nothing achieved here had to reschedule due to Aidan's schedule.	Catch up with Aidan

				agreed to organise for the 11/04 instead.		
11/05	64	1 hour	Catch up with Aidan	Scheduled a catch up with Aidan just to show what I've managed to design so far to see what he thinks and if there's anything refinements I can do before I progress to the next stage of development	Advised I have followed the design process correctly. Can understand why I opted for a much simpler design due to time restraints feedback he provided was to make sure the prototype version has more interaction which showcases the data flow better. All in all, a positive reception cleared consult task on Gantt chart.	
11/05	70	10 mins	Created working environment folders		Named folder TM470 inside folder to contain the application created subdirectories and they are, convert, CSS, include, install, Js and vendor.	
	-	-	Working folder properties – description		Convert will be for testing purposes and will contain all the files and programs needed to feed the database. We will feed this via a spreadsheet. Once my application goes live convert will be removed due to security issues. CSS will contain the local CSS components. Include contains variable system information. Install will contain all the scripts required to create the database. JS will contain	Complete user interface

					the JavaScript file. Vendor will contain the bootstrap framework.	
13/05	-	2 hours	Finished user-interface	Finished design had to make slight adjustments to the width of the navigation bar as well as the drop-down field nothing major at all	Completed design looking back I am glad I decided to opt for a much simpler design I've only just about finished the first stage before the required deadline despite having a lot of previous knowledge moving forward. I feel I have implemented this design with the database in mind so I can now focus on methods for creating a suitable design structure without worrying how it will fit in with my design. Created 3 pages Placed inside my Admin folder my under index.php, disclaimer.php and search-detail.php Added local CSS components to the CSS folder and JS folder to add padding and functionality to the scrolling navigation. Ticked off Gant chart.	Move to the next phase
14/05	66	2 hours	Research on Servers that retrieve and distribute results	-	After carrying out further research Apache will be my chosen web server, PHP will be my chosen scripting language. Due to the fact its open source it's the most popular http server	-

					on the web, easy to configure and its stable. I chose PHP due to the fact speed is a key advantage it works efficiently databases more efficiently and I also have previous experience using the language.	
14/05	67	2 hours	Begin TMA 03	Presentation is letting me down so will need to find a better solution as TMA 03 will be looked on as a draft report. Will speak with Karl first.	As the design stage of my project is now complete. I plan to start spending time on TMA 03 but before I do its important, I start figuring out how I'm going to make my report more presentable according to my feedback the content is there its now just about presenting them	Email Karl for some pointers
15/05	-	10 mins	Emailed Karl for advice	Identify my struggles of making a large report document more accessible will email Karl for pointers before carrying out my own research	Emailed Karl will await his response	
15/05	68	6 hours (with frequent breaks in between)	PHP Udemy course	Want to practise functions, arrays database connections etc	Before I begin my next phase on Monday, I want to spend a bit of time researching the documentation and various tools. Found a cheap online course on Udemy spent time gaining familiarity with the functions, arrays connecting to	Continue with PHP course

					a database properly etc. proved very useful.	
16/05	-	40 mins	Karl advised to watch the TMA 02 tutorial for pointers	-	Helped massively wish I watched it earlier would have made things so much easier will write up a word documents on the requirements and apply them to TMA 03 will also look out for the TMA 03 tutorial as this is going to be extremely helpful	
16/05	-	5 hours	PHP Udemmy Course	-	Finished up the course proved very useful also gained a better understanding on using tools in the php documentation which will help with user validation on the server.	
17/05	-		Begin Phase 2 Application server	-	-	-
17/05	69	2 hours	Install MAMP	-	Will save time and effort and Install the MAMP environment for my local server very easy to install works instantly look forward to testing my project on this once complete will use it to also test the webpage created htdocs folder. Tested on browser by typing in my localhost port received confirmation page that Apache is installed PHP and MySQL environment ready to go. ticked	Test MAMP environment

					Gant chart list as I have decided on my chosen server and scripting language	
17/05	-	10 mins	Test to check if webserver is present.	-	Used MAMP to check whether server/MySQL and php was running accessed information on info.php which uses the command phpInfor()	Check whether PHP is running
	-	10 mins	Test to check if php is up and running	-	Used MAMP to check whether server/MySQL and php was running accessed information on info.php which uses the command phpInfor()	Check whether MySQL is running
	-	10 mins	Test to check my SQL is present and working	-	Used MAMP to check whether server/MySQL and php was running accessed information on info.php which uses the command phpInfor()	
18/05	-	2 hours	Short course on Udemmy based on PHP MySQL and phpMyAdmin	Looking ahead of my project will need to learn about how to use phpMyAdmin to populate my database this short course will help as I've never used it before and will need to know its capabilities timing is great as well as its short enough not to affect my deadlines. Also gave me a refresh on how php MySQL and	Completed the course very straight forward. Learned about the CRUD process of database creation. Also learned about using SQL statements to generate tables and learned how phpMyAdmin can be used to populate the database which will come in handy later on once I begin entering the chosen exercises into the database.	

				html interact with one another which will be a massive help for my application.		
18/05	70	2 hours	Begin work on the include folder -	Will need to create an error page to alert the user if there is an error generating a request	Copied over my front-end script entered a small sentence which will tell the user whether their request has generated an error this will help for communication purposes, so the end user is aware if they have misused the application. Also included a nothing to se page in case the end user requests something that we don't have anything to display	Create a functions script
19/05	71	3 hours	Created my functions.php	Want to implement functions which will help with code reuse along the line used PHP.net resource to search for functions that will help validated the data before it enters the database. I came across for the database to decide what functions will be worthwhile for the database	Created 7 functions I will use throughout my application. The first will clean user input before updating. Used the trim function to clear whitespace before input is added to the database. Also used the htmlspecialchars function to prevent users from inserting harmful code into the database.	Continue creating functions
20/05	72	2 hours	Random number's function	Used Php.net once again to find functions used the strlen function	Once again for security purposes it is important for keys to be random to prevent	Establish database connection

				to get my char variable then used the for loop using the mt_rand function recommended by Joe to generate and return random id number.	attackers from sussing out the lack of randomness which will make it easier for them to crack the key with less effort. Now that I've created my functions page, I have used the include statement to include the script in all my front-end scripts so I can make use of these functions when required.	
20/05	-	1 hour	Include path error	Carried out clean input function as a request and for some reason it isn't recognised not sure what I've done so far everything looks correct so far. clearly something is not right. Asked Joe for some advice on what It could be. Showed him my code identified I my path instructions was incorrect. Included. before my script which meant I was directed to the wrong directory since corrected this by removing the . functions now working great!!	Sorted my path with the help of Joe path is working correctly as I was able to use my functions correctly.	

21/05	73	30 mins	my_vars file establish database settings	-	Declared database server as local declared server, the user and the password. Decided to name my database TM470 as its short and easy to remember. Also included a path to my errors.html page I created on the front end. Now the connection is established I can begin to start creating my database.	Create database class
22/05	74	3 hours	Creating database interface	Had to do a bit of research on the difference between MySQL and MySQLi as most of the tutorials I came across highlighted using MySQLi instead. Realised MySQL is an outdated database driver only can be used procedurally whereas MySQLi can be done procedurally, and object orientated used object. Opted for the object orientated model due to it being more secure.	Began work constructing my database interface script. This will contain the connectivity and the overall functionality of my database. All my database requests will go through this script named the class db. \$db will create a new instance of my database object. I used the constant function which will identify the server, user, password and the name of the database already declared in my_vars.php. The handle variable will use the Server, user, password and database to connect to the database. The connected variable will be used to determine whether the connection was successful or not.	Continue creating database interface

23/05	-	2 hours	Created construct / connect functions	Had to use of PHP.net on how to make use of mysqli_connect, mysqli_select_db and mysqli_error used the example on documentation and implemented within my connect function.	Construct very simple connected will be declared as false. For the connect function I want it to connect to the database when connected is equal to false. If handle is declared false, then connected will be declared as false which will notify the user there was issues connecting to the database. If the connected variable is set to true, I used the MySQLi select function which will include the handle variable as well as the database it needs to connect to else the MySQLi error function will be used to generate the last error message.	Continue creating database
24/05	-	4 hours	Created lastId/ query function	Used PHP.net to make use of the mysqli_insert_id function implemented within my last id function. Had to use of PHP.net to understand mysqli_query. Could see in the example the object orientated function requires a string and an integer.	Used the MySQLi insert function to return the last the id number of the last row entered in my database. Named function query which will require one argument called query declared as int. Made use of the 3 functions found on php.net. declared result variable as the mysqli query function which includes my handle variable and the argument query.	Create ex_files.php

				<p>mysqli_fetch_object requires a string and an array and mysqli_free_results. Requires a result returned by a MySQLi query used the example to implement within my query function</p>	<p>If the result is declared false an error code will generate. Else if result equals true return true. I implemented a while loop. Declared \$rows as a new array. While row = the result using the fetch object function, generate a new row and return the result.</p>	
26/05	75	1 hour	Install exercise database part 1		<p>Included the my_vars script. Declared local variables which establish connection to the server, SQL statements and the results from the server.</p>	Continue creating database
27/05	-	2 hours	Install exercise database part 2	<p>Applied my atom/molecule analogy from previous exercise on relational databases makes it a lot easier to understand</p>	<p>Declared variables which will hold the SQL statements. Defined using an atoms and molecules analogy as the molecules highlight the relationship with the atom. Declared a variable for exercise, muscle category level, equipment, measurement URL and description. Used the primary key which is exercise and applied it each atom to create the molecules.</p> <p>The database will be Installed by running the database scripts each script will generate the tables for exercises and</p>	Continue creating database

					components. Due to security implications this script will be run once. Once constructed it will be removed from my environment because if someone gets a hold of this script it will overwrite my whole database	
28/05	-	3 hours	Defined SQL statements for each variable	-	<p>Declared exercise id as being integer length – 11. Included the not null operator to test for a no null value. Included an auto increment to allow a unique number to be generated when a new record is entered. A varchar with a limit of 128 based on the name of the atom. A null condition to test for a null value. And finally, a primary key which identifies each record in the table. This SQL statement will be applied to all atom and molecules when generating the table.</p> <p>Each table in this script is defined according to the properties. Each item will have a unique Id and a description. The tables are the exercise table muscle table category equipment level and</p>	Continue creating database

					measurement and description. These nine tables will hold all the info. This is a relational database where each table has a relationship with the other tables. This script is only required to run once as security measure. This will have to be removed after, otherwise if run accidentally it will delete the entire database.	
01/06	76	2 hours	Start ex_files.php	Wanted to seek a better way of extracting the details from the database. Had a word with Joe who advised making use of arrays would be a fast and efficient way of getting this information. Before I begin functions, I will spend a few days gaining familiarity on Arrays and how I can utilise this in my functions.	These functions will allow me to get exercise/ muscle, category level, equipment, measurement details. Will need to find an efficient way to execute this	Research arrays on PHP.net consult Joe for advice
02/06	-	2 hours	Read documentation about arrays	I have previous experience using arrays in my Java Assignment although it's a different language the fundamentals are the	Read the documentation initial thoughts is I can declare an array variable and extract all details related based on the id number I've called. Asked Joe for some advice. Advised I can	Continue research

				same. Made use of lists, HashMap's arraylist etc. looking to apply that knowledge into carrying out a similar request using php/MySQL.	declare my db class as a global scope. Can make use of the query function I created in my db class. Can combined this with the sprintf function to return info I've requested using the Id number select the exercise from my database. Can also make use of the object operator to access properties of an object. And can return that information as an array.	
03/06	-	3 hours	Continue researching Arrays	-	Continued research to give myself a better understanding realised I can make use of my clean_outpiut function when extracting data. I feel confident enough to begin creating my functions.	Create all get detail functions
03/06	-	20 mins	TMA 03 Enquiry	Making good progress on my project so far can start to think about TMA 03 strategy. Wanted to know whether it was worth defining the roles I played in this project at the start and how I used my other stakeholders throughout. Wanted clarification on the structure thinking I	Karl gave me the green light said what I suggested was fine will now be able to begin work writing my report as I was happy about the aims and the scope of the project beforehand.	

				should use the first couple of pages to summarise what the project is about the scope the deliverables. Then for the main body can use my selected lifecycle as the main headings and the evaluation will be the last part which will summarise my journey so far sent email to Karl for clarification.		
04/06	-	2 hours	Created get detail functions	-	Created the 5 functions that will get the details of each table all 5 functions carry out the same objective so once one was done was simply a case of copying and pasting whilst making slight amendments on the name of the function and the type of information requested.	Continue developing get functions
05/06	-	2 hours	Created get function based on the exercise searched	-	Created 2 more function this function behaves a little differently to the first 5 these functions will return the muscles, category based on the exercise I search	Continue developing get functions

06/06	-	1 hour	Created get function based on the exercise searched	-	Continued developing the rest of the get functions this time finished level and equipment	Continue developing get functions
07/06	-	1 hour	Created get function based on the exercise searched	-	Continued developing the rest of the get functions this time finished measurement and exercise	Continue developing get functions
08/06	-	1.5 hours	Created get functions that will return information based on the id searched	-	Completed muscle exercise, category exercise and level exercise.	Continue developing get functions
09/06	-	30 mins	Created get functions that will return information based on the id searched		Finished up equipment id and measurement id. They include folder is now complete database is ready for data to be populated will now. Task myself with collecting as many relevant exercises as possible.	
10/06	77	2 hours	Begin Exercise spreadsheet	My knowledge on exercises is fairly limited I am going to make use of the three websites I used initially to review the layouts. I'm going to fill this data with as many exercises I can find. Spoke with Andy and Simon both are happy to check over the exercises. What we've agreed is every time I reach 100 exercises will	Created an excel spreadsheet first table will contain the exercise, 2 nd the primary muscle the exercise targets followed by the secondary muscle due to a lot of exercises hitting multiple muscle groups the third table will be the exercise type the fourth the level the 5 th the equipment requirements and lastly the measurement will be based on how the exercise is measured for example it could be by reps	Populate database

				email him the table for him to inspect to make sure the data, I've entered is accurate. once given all clear will use phpMyAdmin to populate my database	sets if its weights, time if it's a HIIT workout time and distance if it's an aerobic exercise such as running or cycling there will be 5 units of measurement.	
11/06	-	2 hours	Added 50 exercises to spreadsheet	-	Used resources to construct my first 50 exercises.	Continue adding to spreadsheet
12/06	-	2 hours	Added 50 exercises to spreadsheet	-	Continued adding to my spreadsheet of exercises sent to Andy to check over	Continue adding to spreadsheet
13/06	-	3 hours	Received feedback from Andy begin populating using phpMyAdmin	Not happy with how time consuming this is going to be I need to find a quicker way to populate the database messaged Joe asked him if there's a way would could create a script that will add populate the data all at once rather than adding one by one which is a total grind and I fear the amount of data I'm looking to add is going to take up too much of my time where I could be applying myself to other matters of the	Used phpMyAdmin I get the impression this would be useful when adding a smaller amount of data but convinced this tool is not going to help me to populate the data in a timely manner sought advice from Joe advised he will talk me through a script which will populate all at once. Great! This is going to save me a lot of time.	Continue adding to spreadsheet

				project. Joes' response was yes there is a way advised to finish up the spreadsheet once everything is there come back to him and he will help me with the script		
14/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet	Continue adding to spreadsheet
15/06	-	2 hours	Added another 50 exercises to spreadsheet	Advised he made some amendments on the measurement type as some of the exercises can be measured by more than one type also made some corrections on the muscles targeted	Continued the process of adding to my spreadsheet sent to Simon to check	Continue adding to spreadsheet
16/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet.	Continue adding to spreadsheet
17/06	-	2 hours	Added another 50 exercises to spreadsheet	Andy came back to me made some slight adjustments to the exercise types on some entries also made some changes to the level type	Continued the process of adding to my spreadsheet sent to Andy to check	Continue adding to spreadsheet
17/06	-	10 mins	Research report pronouns	Need a better understanding on whether to adopt a	Carried out generic research suggests third person is more often used but I guess it	Await response from Karl

				narrative first person pronoun or whether to adopt third persons	depends on the type of report. I'm guessing my report will be considered an analytical report. Emailed Karl for to see what he thinks as would really help to maintain a consistent approach.	
18/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet. Won't be adding anymore until next week as it's my birthday weekend and don't want to spend it thinking about this project haha will continue next week	Continue adding to spreadsheet
20/06	-	5 mins	Sent follow up email to Karl		Starting work on my report and need a response to my question from the 17 th sent follow up email	Await response from Karl
21/06	-	2 hours	Added another 50 exercises to spreadsheet	Only slight changes this time advised I've done well to take on his feedback of distinguishing and placing exercises in the right category helps that I've done some of these exercises in person.	Continued the process of adding to my spreadsheet sent to Simon to check	Continue adding to spreadsheet
22/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet.	Continue adding to spreadsheet

23/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet. Sent to Andy to check over	Continue adding to spreadsheet
24/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet.	Continue adding to spreadsheet
25/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet. Sent to Simon to check over	Continue adding to spreadsheet
26/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet.	Continue adding to spreadsheet
27/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet. Sent to Simon to check over.	Continue adding to spreadsheet
28/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet.	Continue adding to spreadsheet
29/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet. Sent to Andy to check over.	Continue adding to spreadsheet
30/06	-	2 hours	Added another 50 exercises to spreadsheet	-	Continued the process of adding to my spreadsheet. Sent to Andy to check over. I am going to finish here I now have exactly 864 exercises in the spreadsheet which more than enough feel I may have gone slightly overboard but the more the better will now consult Joe on how to write up my populate script.	Write populate script

02/07	78	1 hour	Populate tables in database	There are two ways to do this. The first is to use php myadmin as recommended Karl this is valid but tedious method. It is a boring process however phpMyAdmin is a great tool for analysis and adding the data will also use phpMyAdmin for testing purposes when that phase arrives.	If the database requires a small amount of data, this is perfect, but my database will contain a large amount of data and will need to consider more efficient methods to populate data. For large sets it would be better to use a script. The source of the raw data is coming via a spreadsheet from the exercise consuler now my task is to convert and transfer data into tables I am going to use a php script to enable me to do this.	Write read script
05/07	-	2 hours	Consult developer on better methods to populate database	We're going to tackle this in a similar way to how I dealt with Simon and Andy previously I am going to write the script at each hurdle will send to Joe to observe and make any changes If necessary	<p>The way we are going to do this is by exporting the spreadsheet into a csv common separated version. The php will then read each commoner line and extract the info and populate each table.</p> <p>The csv file is going to be called the sheet2 file.</p> <p>Convert core script will read the csv line and populate all the tables there's also validation to</p>	Write read script

					make sure of no duplicate entries	
06/07	-	3 hours	Declared variables and read file directory	Used php.net and Joe's guidance to find a function that will read a file and return as a set of strings came across file_get_contents will prove very helpful. Joe advises the quickest and efficient way to converting a file would be to return as an array of strings told me to research and understand the fundamentals of explode will need to use a separator argument which will be \n for a new line and string argument will be the variable I declared as \$file which will contain my csv file	Included global variables my_vars, my_db and my_functions. Declared read in directory made use of the file_get_contents function which reads entire file into string declared my exported csv file sheet2. Declared file_contents made us of explode declared my \$file variable with the new line separator. Declared my 7 variables which are the tables within my spreadsheet.	Continue writing script
07/07	-	2 hours	Created for each loop	Made use of PHP.net to research all 3 constructs.	Opted for the foreach construct as it's an easy way to iterate over arrays. In my case for each iteration in \$file_contents I want it the value to be assigned as \$file_content. I made use of	Continue script

					the list construct to store to assign my declared variables. For each input I made use of the filter_var function so that I could use of both the filter_sanitize_string and filter_flag_encode_amp filters to strip away unwanted characters for each list.	
08/07	-	2 hours	Find exercise and write primary muscle scripts	-	<p>Declared 3 variables, \$query which is the same script I used in my ex_files.php script which will make use of the sprint function by selecting all columns from the exercise table. Also made use of my clean_input function for input \$exercise. Second variable \$result will make use of my query function to perform the query on my database. And lastly the final variable is \$exercise_id which will hold my \$result query and access the properties in exercise_id.</p> <p>Completed the if statement for the primary muscle variable used the same 3 variables, I used in the find exercise script. Added another \$query variable which this time inserts new</p>	Finish off last of the script

					records into the excersies_muscle molecule.	
09/07	-	2 hours	Finished up on the rest of the if statements	-	Pretty much a copy and paste job from the primary muscle statement just amended the input to match the input variable for secondary muscle, type, level, equipment and measurement. Included a statement at the end that will notify the user that the conversion is complete.	Testing phase
12/07	79	-	TESTING PHASE	-	Now that the application and the database has been constructed it is now time to test all the components scripts to make sure everything is working correctly	
12/07	-	1 hour	Creating a testing procedure.		<p>Need to check data has been transferred correctly. Using phpMyAdmin.</p> <p>Take one table muscle for example. check spellings – check correct data don't want to find equipment in muscle for example</p> <p>Start with level check all data transferred then check spelling mistakes – finally do the exercise look at each exercise</p>	Test each of the inputs

					<p>to make sure they are related to the correct components.</p> <p>There is no other way to validate other than eyeballing as any errors could result in injuries.</p>	
13/07	-	-	TMA 03 Submitted	-	Submitted draft report will await feedback from Karl before proceeding to the EMA	Await feedback for tma 03
13/07	-	20 mins	Ran the convert_core.php script	-	Exercises have now been generated as shown in the phpMyAdmin as the exercise table now contains 862 rows and category 7 equipment 13 level 4 measurement 8 muscle 23.	Run convert exercise script
13/07	-	30 mins	Ran the convert_exercise_file.php script	-	Checked phpMyAdmin script has been successful added as results are revealed.	Begin testing each input selection
13/07	-	30 mins	Ran application on local server.	Disclaimer message should come up before accessing the application. Goes straight to the search engine will need to re - check the name of the file as well as the links. Implemented a drop-	Disclaimer page requires work as needs to be set as the index page as this should be the first page that will load when accessing the application	

				down menu thinking I would need it but doesn't serve any purpose will remove from the front end. Will also include a link or tab for the user to begin a new search once result has generated.		
13/07	-	2 mins	Pressed submit button with no options selected And the cancel button	Need to add some front-end validation to signify nothing has been selected once selected it blocks the user from selecting any of the options	Front needs a bit of validation added to let the user know request can't be submitted without an option being selected cancel button works as it should select all options followed by cancel and it removes original option selected	
14/07	-	10 mins	Category - Cardio – search	Skipping has a double entry will need to investigate that	Returned all cardio results will need to remove the double entry will make the change once all testing has been carried out	Continue testing application
14/07	-	10 mins§	Category – Olympic Weightlifting	-	Returned all Olympic weightlifting results	Continue testing application
14/07	-	10 mins	Category – Plyometrics search	-	Returned all Plyometrics results	Continue testing application
14/07	-	10 mins	Category – powerlifting search	-	Returned all powerlifting results	Continue testing application

15/07	-	1 hour	Category – Strength	-	Returned accurate Strength results no sign of spelling mistakes	Continue testing application
15/07	-	30 mins	Category – Stretching search	-	Returned accurate Stretching results no errors	Continue testing application
16/07	-	10 mins	Category – strongman	-	Returned accurate strong man results no errors found	Continue testing application
18/07	-	1 hour	Level – Beginner search	-	Returned accurate Beginner results no sign of selling mistakes	Continue testing application
18/07	-	10 mins	Level – Expert search	-	Returned accurate expert results no spelling mistakes	Continue testing application
19/07	-	1 hour	Level – Intermediate search	Minor error but the list order is beginner expert intermediate. Intermediate needs to be in the middle.	Returned accurate expert results no spelling mistakes	Continue testing application
19/07	-	30 mins	Equipment – (other)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
20/07	-	10 mins	Equipment – (foam roll)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
20/07	-	1 hour	Equipment – (Body)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
21/07	-	10 mins	Equipment – (Kettle Bell)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application

21/07	-	40 mins	Equipment – (Dumbbell)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
21/07	-	20 mins	Equipment – (cable)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
21/07	-	10 mins	Equipment – (EZ Bar)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
22/07	-	20 mins	Equipment – (Machine)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
22/07	-	10 mins	Equipment – (bands)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
22/07	-	5 mins	Equipment – (medicine ball)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
22/07	-	5 mins	Equipment – (Exercise ball)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
23/07	-	10 mins	Equipment – (Barbell)	-	Returned accurate results no signs of errors or spelling mistakes	Continue testing application
23/07	-	20 mins	Equipment – (Kettlebells)	-	Returned accurate results no signs of errors or spelling mistakes all singular input selections have been tested for category, level and equipment next will be the muscle types.	Continue testing application

24/07	-	1 hour	Muscle – (Abs) – and all options	-	Returned accurate results no signs of errors or spelling mistakes. Added category cardio no result found, Olympic weightlifting no result found, plyometrics returned 5 results added level intermediate returned 5 results, searched medicine returned 3 results. Searched other returned 1 result. Searched body returned 1 result. Everything working as it should.	Continue testing application
24/07	-	10 mins	Test – Muscle (Abductors)	-	Submitted result reveals correct result of the 7 abductor exercises will now amend search by adding in a category.	Continue testing application
25/07	-	10 mins	Abductors – category – (strength)	-	Returned 2 results	Continue testing application
26/07	-	10 mins	Abductors – category (Stretching)	-	Result reveals 5 results checked the detail.	Continue testing application
26/07	-	10 mins	Abductors – category (Stretching) – level	Realised there's an error I've got 2 beginners and it's also spelt incorrectly should only be 3 levels will remove this. Highlighted red as a reminder	Result revealed 3 results exercises are accurate. Searched expert no results, searched intermediate revealed 2 results.	Continue testing application

27/07	-	10 mins	Abductors – Level Beginner	-	Returned 3 results for beginner. Returned 4 results for intermediate, none for expert.	Continue testing application
27/07	-	30 mins	Abductors – Equipment search	-	Returned 1 result under foam roll, returned 4 results under body, 1 result under machine and one result under bands	Continue testing application
27/07	-	10 mins	Muscle – (Abs Chest)	-	Returned 1 result, selected all relevant options which also returned the same result so all working well.	Continue testing application
28/07	-	10 mins	Muscle - Adductor	Realised I have a double entry of adductor and adductors will need to investigate this further as they both reveal different results, I think I may have misspelled for abductors they are spelt similarly so will review this	Search returned 2 results.	Continue testing application
28/07	-	20 mins	Muscle – Adductor – category – level and equipment		Searched stretching returned 2 results. Added beginner level returned 2 results. Selected foam roll equipment returned 1 result. Amended to body returned 1 result.	Continue testing application
28/07	-		Muscle - Arms	This is a much larger sample don't have to carry out detailed tests due to time constraints will need to condense	Amended my testing for the larger tables. What I will do is carry out the muscle research. Whatever category I select I will look at the detail of each	Continue testing application

				<p>down the search. Have acknowledged if my project was going live would Take a collection of at least 5 people to check for errors because this a database with info that can cause injuries when not performed correctly also would pass on to pass on to exercise consultant to make sure each exercise category is correct.</p> <p>I would carry out Stress testing quantitative testing to test application. Beta testing put in an option for feedback from users.</p> <p>There is a table created called description which is supposed to hold a description of each exercise unfortunately this is time consuming</p>	<p>exercise and match them the level and equipment based on that exercise to see if they generate when those options are selected as I have my ema report to do and I have so many other muscle types to test and won't have the time to carry out a detailed testing procedure</p>	
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				and beyond the scope of my project		
29/07	-	1 hour	Muscle Back – search	-	Checked detail for all exercises all workouts related to the back. No duplicates spelling is correct	Continue testing application
30/07	-	30 mins	Muscle Biceps - search	-	Checked detail for all exercises all workouts related to the biceps. No duplicate entries spelling is correct.	Continue testing application
01/08	-	30 mins	Muscle – Calves - search	-	Checked detail for all exercises all workouts related to the calves. No duplicate entries spelling is correct	Continue testing application
02/08	-	10 mins	Muscle – Cardio search	-	Checked detail for all exercises all workouts related to the cardio. No duplicate entries spelling is correct	Continue testing application
03/08	-	30 mins	Muscle Chest search	-	Checked detail for all exercises all workouts related to the chest. No duplicate entries spelling is correct	Continue testing application
04/08	-	20 mins	Muscle – Forearm search	Got another entry called forearms which has one result think I will add that entry to forearms.	Checked detail for all exercises all workouts related to the forearms. No duplicate entries spelling is correct	Continue testing application
05/08	-	15 mins	Muscle Glutes search	-	Checked detail for all exercises all workouts related to the glutes. No duplicate entries spelling is correct	Continue testing application

05/08	-	35 mins	Muscle – Hamstring's search	-	Checked detail for all exercises all workouts related to the hamstring. No duplicate entries spelling is correct	Continue testing application
06/08	-	20 mins	Muscle – Lats search	-	Checked detail for all exercises all workouts related to the lats. No duplicate entries spelling is correct	Continue testing application
06/08	-	20 mins	Muscle – lower legs search	-	Checked detail for all exercises all workouts related to the lower leg. No duplicate entries spelling is correct	Continue testing application
09/08	-	5 mins	Muscle – Neck search	-	Checked detail for all exercises all workouts related to the neck. No duplicate entries spelling is correct	Continue testing application
09/08	-	30 mins	Muscle – quadriceps search	-	Checked detail for all exercises all workouts related to the quadriceps. No duplicate entries spelling is correct	Continue testing application
10/08	-	30 mins	Muscle shoulders search	-	Checked detail for all exercises all workouts related to the shoulders. No duplicate entries spelling is correct	Continue testing application
10/08	-	5 mins	Muscle traps search	-	Checked detail for all exercises all workouts related to the traps. No duplicate entries spelling is correct	Continue testing application
11/08	-	15 mins	Muscle Triceps search	-	Checked detail for all exercises all workouts related to the triceps. No duplicate entries spelling is correct	Continue testing application

11/08	-	30 mins	Muscle upper legs search	-	Checked detail for all exercises all workouts related to the upper legs. No duplicate entries spelling is correct	Continue testing application
12/08	80	-	System clean-up process		<p>This is where I go back in to refine all of the errors, I picked up in testing will tackle each one.</p> <p>Remove the covert, install to be removed because it contains scripts that if run incorrectly will destroy database I just a considerable amount of time constructing a back-up has been constructed.</p>	
13/08	-	1 hour	Sorted disclaimer page – removed drop down menu	-	Sorted the Disclaimer page changed to index to make this the first page added in radio buttons for the user to accept the terms if they are happy will gain access to the webpage if not, they will remain on the disclaimer page. Removed drop down menu as I no longer need it. Added a new search link which will direct the user back to the search engine to start a new search.	Continue clean-up process.
14/08	-	1.5 hours	Adding in bootstrap front-end validation	-	Added in html form submission validation if nothing has been entered and the user clicks	Continue clean-up process.

					submit all 4 inputs will highlight red and with a * a message will display field required.	
16/08	-	10 mins	Removed duplicate entry and other slight amendments	didn't bother changing the order of levels need to prioritise my EMA report and don't want to make the change in case it effects the which exercise it assigned the level Id number.	Removed duplicate entry for skipping. Changed adductors to abductors. Removed the forearms entry re-allocated single entry to forearm.	Continue clean-up process.
16/08	-	-	PROJECT COMPLETE	-	-	-

7.2 Appendix - Initial design layout

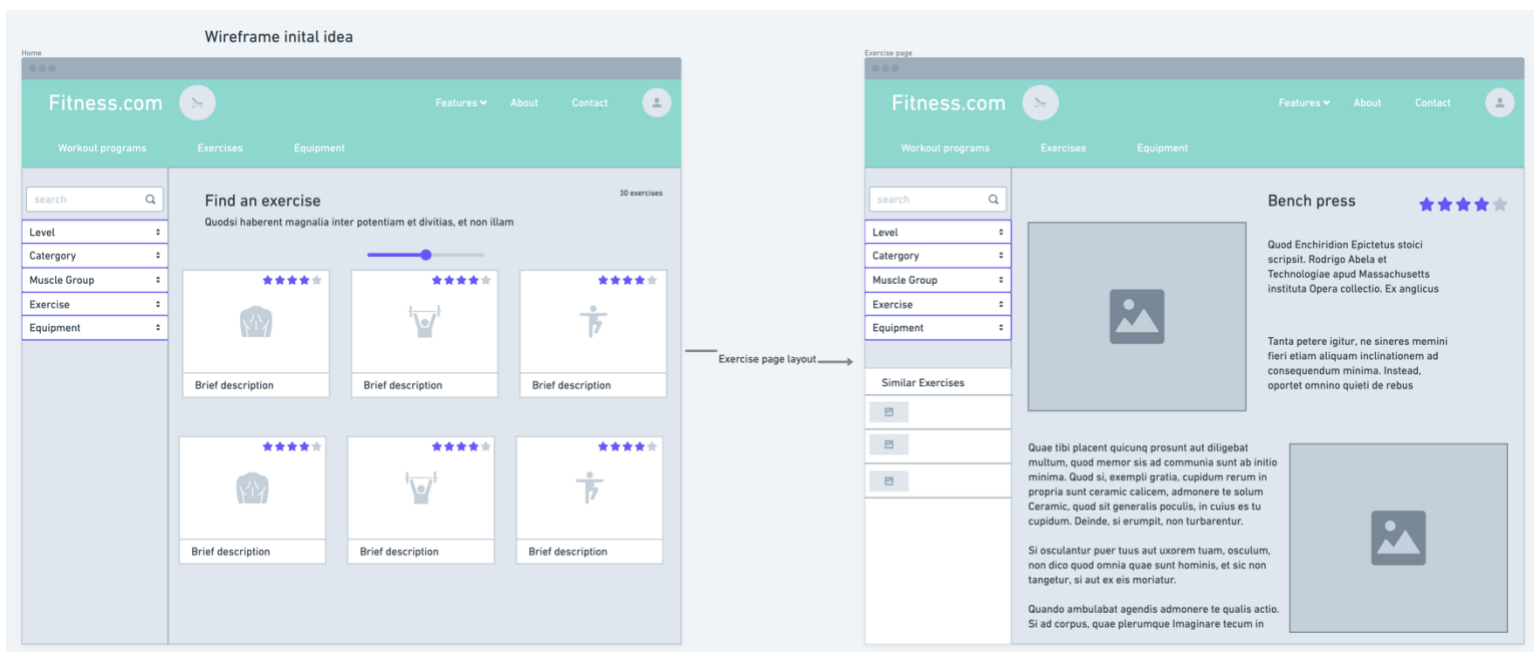


Figure 7.1 Initial schematic design

7.3 Appendix - Interviews with stakeholders

7.3.1 personal trainer

Q. How would you define an exercise?

A. I would define an exercise as a repetitive performance of a chosen activity geared towards improving physical fitness and overall health.

Q. What are the components of an exercise?

A. I would define 4 main components of an exercise, those are strength, cardiovascular, flexibility and bodyfat composition. Traditionally there are two methods that can be used to achieve this. Gym equipment such as weights Barbells and resistance bands can be used, in conjunction with your own bodyweight, which is commonly known as calisthenics.

Q. What are users seeking from an exercise?

A. Most users use exercise to improve their physical appearance, others seek exercise as a tool to improve in a particular activity they're into such as running cycling. Others use exercise to improve their mental well-being.

Q. Are there any recommendations you can provide to improve the search?

A. when searching for exercise split them into categories such as muscle groups, equipment required, and difficulty level. You could also include images or videos of someone performing the exercise.

Q. Are there any good electronic sources of exercises that I can download from the internet?

A. I would target fitness sites such as workout labs and bodybuilding.com although you must pay a subscription to access all the material, they provide most of the content you need for free.

Q. Would you be able to assist this project as a consultant?

A. Yes

My thoughts

Great interview really helped develop a greater understanding on how you can develop a muscle group using exercises, in conjunction with equipment to achieve the goal set out.

7.3.2 UX/UI designer

Q. What are the best front end UI kits to use?

A. I would recommend Bootstrap because it's easy to use, is open source and contains a lot of documentation in case you get stuck on something.

Q. Will the chosen tools require a steep learning curve?

A. No as you have previous experience with it you will be fine

Q. What techniques do you use to make a user face user friendly?

A. Adhere to the W3C standards, Attractive visuals, good use of colour. A consistent style throughout the interface. Good feedback on the user's actions. Lastly a well-defined target audience is a must! I would also recommend you look into Human-centred design as it uses design techniques that focus on the human interaction which will really help you considering the application will be used by keen gym users.

Q. What are the best design methods used to develop an idea?

A. I would start with a mind map and a clear target audience, once the requirements have been identified either sketch out a rough drawing on paper or you can use a program call Whimsical. it's easy to use and you can generate designs, wire-frames flowcharts easily. Once you're happy with your chosen design I would recommend a program called Figma which brings your design to life and with real time editing you can design and test your design as you go along.

Q. Can you tell me techniques I can use to improve the speed of the user interface?

A. Keep your design simple. If using HTML, CSS by removing excessive code, comments, etc. There are tools available that will condense your code and remove excessive spaces.

Q. How would you define a successful design?

A. These are the traits a successful user interface will have. Clear layout, easy to navigate, responsive and fast user interface and a consistent and familiar style throughout.

Q. Would you be able to assist this project as a design consultant?

A. yes

My thoughts

Really helped increase my understanding on the design process, was interesting looking at how a simple design on paper can transform into a fully functional real world user interface.

7.3.3 Back-end Developer

Q. I need a database to store gym exercises. What is the best database management system to use?

A. I would recommend MySQL or MariaDB, as it's noted for its ease of use, reliability and quick processing.

Q. Which platform would be best to run the system bearing in mind that I am a poor improvised student? Do I need any special software, or could I use an open-source platform?

A. As you use a Mac you can opt for the MAMP stack. Apache is the web server, MySQL the database is an open-source platform, and PHP can be the server scripting language.

Q. How do you easily put information into a database?

A. Use SQL statements with a scripting language like PHP to add, amend and delete data into the tables within the database. I would also adopt Relational Database modelling, where you can model the information into sets of tables.

Q. If server scripts are to be used, what would be an efficient language to use bearing in mind that data will be extracted from the database?

A. PHP is designed to be used for web purposes, its widely used simple and straight forward to learn.

Q. What are the encryption methods used to ensure the database is secure?

A. There are functions (hashing algorithm) available within programming languages that allow you to encrypt or decrypt data.

Q. Finally, would you be able to assist this project as server consultant?

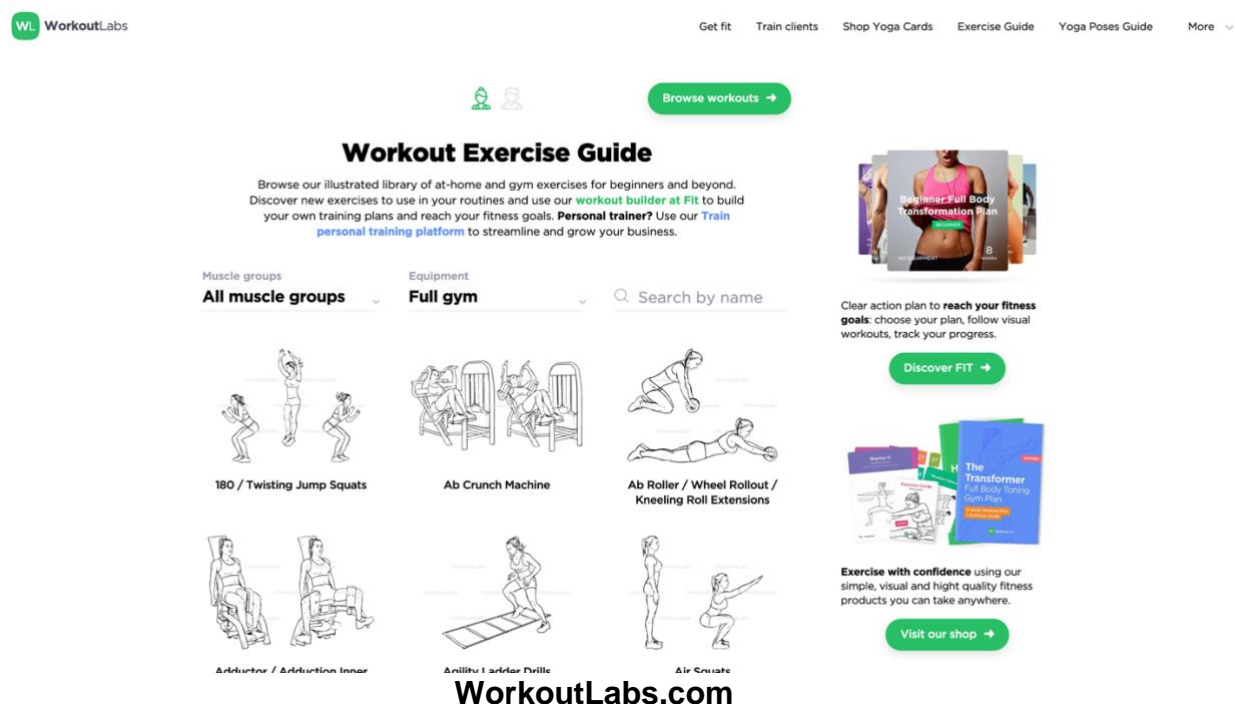
A. Well, for a fee, I can be bought.

My thoughts

Really insightful character really helped me understand how the process of making a user interface fully functional and how the web page connects with the application server and the database. I look forward to increasing my knowledge as I progress through the project.

7.4 Appendix - Web Page Research

Research on the web



Overview

This website appears to be a tool for users and personal trainers to use the search platform to build their own personal trainer program. This platform also appears to target self-employed personal trainers. The site contains a coaching platform track their progress, and engaging in visual workouts, this option is a chargeable option.

Advantages

Simple and easy follow design

contains two dropdown lists the first muscle groups the second equipment would help those not familiar with the exercise names

images make it easier to distinguish what the exercise looks like

ability to search exercise by name

contains a brief description on the exercise

very user friendly

has an image which illustrates what muscle groups are being targeted

Disadvantages

Could contain a rating system which defines how effective each exercise is

Nothing to distinguish the fitness levels of the user

Doesn't recommend exercises depending on what the user it's trying to do for example professional sportsman etc

Should define exercises that help with mental health as well as physical

The screenshot shows the Bodybuilding.com website interface. At the top, there is a navigation bar with a search bar and various links like 'Sales & Specials', 'Top 50 Products', 'New & Trending', 'Account', and 'Cart'. Below the navigation bar, there is a breadcrumb trail: 'Main > Training > Exercise Database > Exercise Finder'. The main content area displays a list of exercises, each with a small image, a title, a rating (e.g., 9.6, 9.5), and a description of the muscle targeted and equipment type. On the left side, there are two filter sections: 'Muscles' and 'Exercise Type'. The 'Muscles' section includes checkboxes for Chest, Forearms, Lats, Middle Back, Lower Back, Neck, Quadriceps, Hamstrings, Calves, Triceps, Traps, Shoulders, Abdominals, Glutes, Biceps, Adductors, and Abductors. The 'Exercise Type' section includes checkboxes for Cardio, Olympic, and Weightlifting.

Exercise	Rating	Muscle Targeted	Equipment Type
Rickshaw Carry	9.6 Average	Forearms	Other
Single-Leg Press	9.6 Average	Quadriceps	Machine
Landmine twist	9.5 Average	Abdominals	Other
Weighted pull-up	9.5 Average	Lats	Other
T-Bar Row with Handle	9.5 Average	Middle Back	Other
Palms-down wrist curl over bench	9.5 Average	Forearms	Barbell
Atlas Stones	9.5 Average	Lower Back	Other
Dumbbell front raise to lateral raise	9.5 Average	Shoulders	Dumbbell

Bodybuilding.com

Overview

One of the largest fitness platforms that provides is users with a platform to achieve their goals by offering an all-round overview service to fitness. This includes nutrition, Get fit plans, muscle building programs and weight loss plans.

Advantages

Contains an average

Has a section for exercise types

Has a level for exercises

Contains mechanic's type

Information is easy to identify

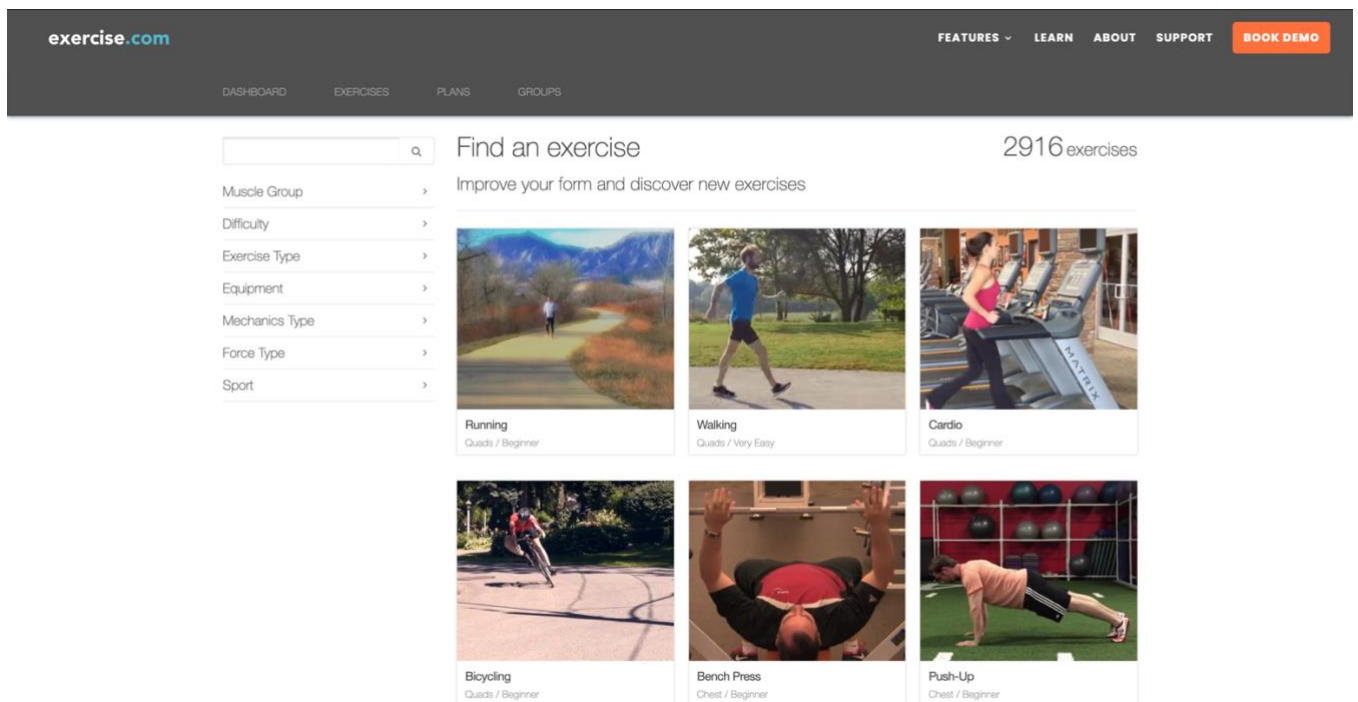
Disadvantages

Layout is quite cluttered everything is bunched together

Images are too small difficult to see what the exercise is without clicking the link

Types should be in drop down lists to make it easier to navigate through the website.

Requires the user to sign up for a paid member ship to gain access to the rest of the content whereas other platforms are offering the same content for free



Exercise.com

Overview

This web page appears to target personal trainers who want to grow their businesses, they offer more services on top of the search engine facility such as scheduling appointments, client assessments and delivering workout programs.

Advantages

Contains a drop down for difficulty

Simple easy to follow layout

Good use of images

Includes a drop down for recreational activities such as walking cycling.

Contains muscles worked image

Provides a step-by-step guide on how to perform exercise

Provides force types

Provides mechanical types

Contains variations

Provides links to featured plans as well as similar exercises

Contains A my performance log compares that with other users

Includes a comments/ rating section from fellow users

Disadvantages

Design lets this webpage down although it presents information not easy on the eye.

Amount of exercises display is inaccurate. When selecting hip flexors, it says it has 46 exercises but only displays 10 loads more buttons doesn't show.

Functionality issues when selecting muscle group groin nothing comes up even though the system states it has 34 related exercises. However, when you select another check box alongside it such as outer thighs it then displays the groin exercise set along with outer thigh. But when you select just outer thigh same thing happens.

7.5 Appendix – Exercise Database design concept

Exercise database design

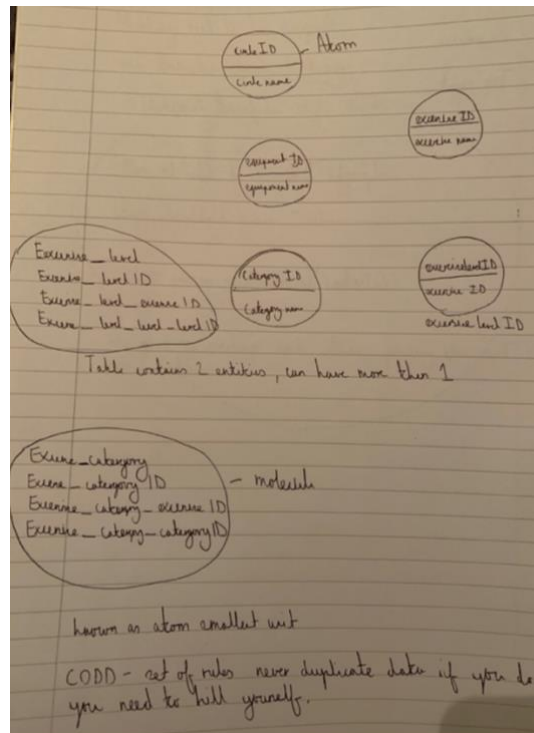


Figure 7.2 Atom/ molecule analogy for my database design

Level Table		Exercise Table		Muscle Table	
Id	Description	Id	Description	Id	Description
1	Intermediate	29	ab crunch machine	1	Abs
2	Beginner	1	ab roller	2	Upper Legs
3	Expert	2	adductor foam roll	3	Adductor
4	Bginner	3	adductor/groin stretch	4	Glutes
		4	advanced kettlebell windmill	5	Cardio
		5	air bike	6	Quadriceps
		6	all fours quad stretch	7	Arms
		7	alternate hammer curl	8	Biceps
		8	alternate heel touchers	9	Shoulders
		9	alternate incline dumbbell curl	10	Chest
		10	alternate leg diagonal bound	11	Hamstrings
		11	alternating cable shoulder press	12	Back
		12	alternating deltoid raise	13	Abs Chest
		13	alternating floor chest press	14	Lower Legs
		14	alternating hang clean	15	Calves
		15	alternating kettlebell press	16	Lats
		16	alternating kettlebell row	17	Adductors
		17	alternating lunge jump	18	Triceps
		18	alternating renegade row	19	Traps
		19	ankle circles	20	Forearm
		20	ankle on the knee	21	Neck
		21	anterior tibialis foam roll	22	Forearms
		22	anti-gravity press	23	Abductors
		23	arm circles		
		24	arnold dumbbell press		
		25	around the worlds		
		26	atlas stone trainer		
		27	atlas stones		
		28	axle deadlift		
		30	back flies with bands		
		474	back quad stretch		
		457	Back shrug		
		31	backward drag		
		33	balance board		
		35	band assisted pull-up		
		180	band crossover		
		36	band good morning		
		37	band good morning - pull through		
		38	band hip adductions		
		39	band pull apart		
		40	band skull crusher		
		649	bands shoulder press		
		41	barbell ab rollout		
		42	barbell ab rollout - on knees		

Figure 7.3 Schema of tables

7.6 Appendix – Database populate script

```
<?php

// convert core files from csv files
// -----

// include global variables
// -----
include( "../include/my_vars.php" );
include( "../include/my_db.php" );
include( "../include/my_functions.php" );

// convert text file to database ( file is in csv format)
// -----

// read file in directory
// -----
$file      = file_get_contents("sheet2.csv");
$file_contents = explode("\n",$file);

// declare variables
// -----
$exercise = $primary_muscle = $secondary_muscle = $type = $level = $equipment =
$unit_of_measurement = "";

// loop, process all lines in file
// -----
foreach ($file_contents as $file_content) {

    // split line
    // -----
    list($exercise, $primary_muscle, $secondary_muscle, $type, $level, $equipment,
$unit_of_measurement) = explode(",", $file_content);

    // clean each input item
    // -----
```

```

        $exercise      = filter_var($exercise, FILTER_SANITIZE_STRING,FILTER_FLAG_ENCODE_AMP
);

        $primary_muscle    = filter_var($primary_muscle,
FILTER_SANITIZE_STRING,FILTER_FLAG_ENCODE_AMP );

        $secondary_muscle  = filter_var($secondary_muscle,
FILTER_SANITIZE_STRING,FILTER_FLAG_ENCODE_AMP );

        $type              = filter_var($type, FILTER_SANITIZE_STRING,FILTER_FLAG_ENCODE_AMP );
        $level              = filter_var($level, FILTER_SANITIZE_STRING,FILTER_FLAG_ENCODE_AMP );
        $equipment          = filter_var($equipment,
FILTER_SANITIZE_STRING,FILTER_FLAG_ENCODE_AMP );

        $unit_of_measurement= filter_var($unit_of_measurement,
FILTER_SANITIZE_STRING,FILTER_FLAG_ENCODE_AMP );


// initialise lastid
// -----

$exercise_lastid = "";
$primary_muscle_lastid = "";
$secondary_muscle_lastid = "";
$category_lastid = "";
$level_lastid = "";
$equipment_lastid = "";
$measurement_lastid = "";


// exercise
// -----

if($exercise) {
    $query = sprintf("SELECT * FROM exercise WHERE exercise_name=%s LIMIT 1", clean_input(
$exercise ) );

    $result = $db->query($query);
    if(count($result) == 0) {
        $query = sprintf("INSERT INTO exercise (exercise_name) values(%s)", clean_input( $exercise )
);

        $result = $db->query($query);
        $exercise_lastid = $db->lastid();
    }
}

// process all others if exercise lastid is valid
// -----

```

```

if( $exercise_lastid ) {

    // muscle, primary (1:1)
    // -----
    if( $primary_muscle ) {
        $query = sprintf("SELECT * FROM muscle WHERE muscle_name=%s LIMIT 1", clean_input(
$primary_muscle ));
        $result = $db->query($query);
        if(count($result) == 0) {
            $query = sprintf("INSERT INTO muscle (muscle_name) values(%s)", clean_input(
$primary_muscle ));
            $result = $db->query($query);
        }
    }

    // muscle, secondary (1:1)
    // -----
    if( $secondary_muscle ) {
        $query = sprintf("SELECT * FROM muscle WHERE muscle_name=%s LIMIT 1", clean_input(
$secondary_muscle ));
        $result = $db->query($query);
        if(count($result) == 0) {
            $query = sprintf("INSERT INTO muscle (muscle_name) values(%s)", clean_input(
$secondary_muscle ));
            $result = $db->query($query);
        }
    }

    // exercise type (1:1)
    // -----
    if($type) {
        $query = sprintf("SELECT * FROM category WHERE category_name=%s LIMIT 1",
clean_input( $type ));
        $result = $db->query($query);
        if(count($result) == 0) {
            $query = sprintf("INSERT INTO category (category_name) values(%s)", clean_input( $type
));
            $result = $db->query($query);
        }
    }

    // level (1:1)

```

```

// -----
if( $level ) {
    $query = sprintf("SELECT * FROM level WHERE level_name=%s LIMIT 1", clean_input(
$level ) );

    $result = $db->query($query);
    if(count($result) == 0) {
        $query = sprintf("INSERT INTO level (level_name) values(%s)", clean_input( $level ) );
        $result = $db->query($query);
    }
}

// equipment (1:1)
// -----
if( $equipment ) {
    $query = sprintf("SELECT * FROM equipment WHERE equipment_name =%s LIMIT 1",
clean_input( $equipment ) );

    $result = $db->query($query);
    if(count($result) == 0) {
        $query = sprintf("INSERT INTO equipment (equipment_name) values(%s)", clean_input(
$equipment ) );

        $result = $db->query($query);
    }
}

// measurement (1:1)
// -----
if( $unit_of_measurement ) {
    $query = sprintf("SELECT * FROM measurement WHERE measurement_name=%s LIMIT
1", clean_input( $unit_of_measurement ) );

    $result = $db->query($query);
    if(count($result) == 0) {
        $query = sprintf("INSERT INTO measurement (measurement_name) values(%s)",
clean_input( $unit_of_measurement ) );

        $result = $db->query($query);
    }
}
}

```

```
}

// inform user & terminate
// -----
echo ("Conversion of core files is now completed. ");

?>
```


7.7 Appendix – Communication with tutor

<p>Tue 02/02/2021 19:05</p>	<p>Hi Kyan,</p> <p>Thanks for your project proposal, it is definitely a good start. The first thing that strikes me is both that it is quite a large ambitious project and that currently the scope and boundaries seem a bit ill-defined. There is no problem having an ambitious project , but I think it is important to break it into smaller parts and prioritise them , this will also help you define a manageable scope. so my advice would be to try and create a more detailed list of requirements, with success criteria for each and then prioritise them , possibly identifying a “minimum viable product” and some later “stretch” goals. For the purpose of meeting the TM470 learning objectives I would also try to make sure that your priority list involves building what you might consider a vertical slice of the whole project first, i.e. creating a small part of the front end website, a small part of the database and whatever business logic you need to connect these. This will demonstrate a broader range of skills then trying to complete the whole of the website and nothing else for example. This is not necessarily the way you might plan an open ended project but you do need to build your project around the various TMA and EMA deadlines of TM470.</p> <p>The other obvious question is whether you are intending to build a prototype hosted locally or something nearer to a release-able product. Don't forget that The Open University does not provide you with any server space or funds to host your project so you would have to pay for these yourself. Some cloud providers offer some free services to get you started but they will all require a credit card to sign up and start to charge you once the free period has ended.</p> <p>And the final consideration for any development project(which I will be banging on about for the next few months!) is that you must remember that it is not your application or website that gets marked but your report document. None of your markers will actually make use of your app or website , all your marks will be based on how well your report document shows that you have met the learning objectives. The temptation on a development project is to carry on developing code as this is the interesting part but sadly this isn't what gets marked! Especially towards the end of the project you are better off spending time on your report than on adding additional functionality.</p>
-------------------------------------	--

	<p>I will try to cover this in more detail in the video that I'm hoping to make soon.</p> <p>In the meantime, please carry on putting your thoughts together and I look forward to hearing more of your ideas.</p> <p>Kind regards,</p> <p>Karl</p>
<p>Sun 07/02/2021 21:23</p>	<p>Appendices are your friends here! They don't contribute to your wordcount but are great for things that demonstrate some learning objective (such as your record keeping ability), but you don't actually expect anyone to read in detail.</p> <p>Hope that helps,</p> <p>Kind regards,</p> <p>Karl</p>
<p>Sun 21/02/2021 19:54</p>	<p>Hi Kyan,</p> <p>Short answer – yes, that is a really good start!</p> <p>Some additional thoughts:</p> <p>Don't forget about ethical and legal issues (not necessarily for TMA01), there are some potentially interesting things here. Data modelling and database design might be challenging, it strikes me that you might have many-to-many relationships between muscle groups, exercises and exercise kit so you might need intermediate tables to link these – I'm happy to look at a preliminary design as soon as you have one</p> <p>It is good to research appropriate servers, but don't forget that for TM470 purposes you don't actually need to implement a live server, you could do all development locally if you want to (although that might make it difficult to do user testing – if you do buy in some external hosting remember that you have to meet those costs yourself).</p>

	<p>I think it is right to leave the administration screens until later, if you are using MySQL or MariaDB you can most of your database management using phpmyadmin or adminer</p> <p>And finally, try to find time to watch my videos if you can, I'm sure you'll find something useful in there, especially regarding TMA01 – although you have made significant progress towards that anyway.</p> <p>Hope this is useful,</p> <p>Keep in touch,</p> <p>Kind regards,</p> <p>Karl</p>
<p>Wed 17/03/2021 23:22</p>	<p>Hi Kyan</p> <p>Those are all good questions! See my answers below...</p> <p>Hope that helps,</p> <p>Karl</p> <p>From: Kyan Keise <kyankeise@outlook.com> Sent: 17 March 2021 17:45 To: K.R.Wilcox <k.r.wilcox@open.ac.uk> Subject: TMA 02 enquiry</p> <p>Hi Karl,</p> <p>Hope you're well, just looking for a bit of clarification for TMA 02:</p> <p>Do I treat TMA 02 as an organic follow up from TMA 01?</p>

	<p>***** You can certainly build TMA02 from TMA01 – as well as the new material some of the existing bits will need revision, some might now be redundant and others can be copied over unchanged. It is helpful if you marked the unchanged bits somehow (put them in italics or something) but this is just to help me with my marking and not mandatory.</p> <p>Would it be best to wait for feedback from TMA 01 before starting TMA 02 or should I continue developing my project?</p> <p>***** ideally, yes, but I have to be honest and admit that I have a lot of marking to do on other modules as well so I probably won't get round to your TMA01 until next week.</p> <p>Is the purpose of TMA 02 to demonstrate revision and changes made TMA 01 including legal, ethical issue?</p> <p>***** It is evaluated against the (slightly different) set of learning objectives on its own merits, however where the learning objectives are the same as TMA01 we do expect to see some advance on them (or at least an acknowledgement that you have reviewed something and determined that no update is required).</p> <p>Overall project enquiry</p> <p>Does A finished working project need to be submitted along with the EMA report?</p> <p>***** No! Your EMA will be marked solely on the basis of the EMA report. If you are producing an app or a website or whatever this will NOT be evaluated or tested in any way. You are expected to cover the final state of your project deliverables in the EMA report (using, for example, screenshots). It is perfectly possible to get a high grade on TM470 without having a fully operational project deliverable, especially if your risk analysis recognises that possibility!</p>
<p>Wed 24/03/2021 19:09</p>	<p>Hi Kyan,</p> <p>That is an interesting question, really all we're looking for is evidence that you have considered the legal aspects of your own project, so I would tend to focus only on that unless there is something really significant and important from the wider project. Ironically, there could well be issues of confidentiality arising if you tell us too much about legal issues related to your wider project, so on the whole I think it is best to discuss the issues local to your project, but explain that is part of a large whole that brings its own set of issues.</p> <p>I hope that helps,</p> <p>Kind Regards,</p> <p>Karl</p>

<p>Mon 12/04/2021 11:34</p>	<p>Hi Kyan,</p> <p>Another good question! (My next tutorial is writing itself here...)</p> <p>Yes, you are perfectly free to ask whoever you like for help (after all, you would in a real life project) – the important point is that you acknowledge the source of the help. Arguably, recognising when you need outside help is an important project management skill. In fact tutors are assigned to students who are likely to develop projects in their particular area of expertise (for example, because I teach on TT284 and TM352 I tend to be assigned students who have done those modules and so are likely to do something app or web based). Hence you can also regard me as a “source of expertise” and try tricky technical questions on me (nothing I like more...!)</p> <p>I hope that helps,</p> <p>Kind Regards,</p> <p>Karl</p>
<p>Tue 13/04/2021 17.27</p>	<p>Describing your thought process is definitely a good thing, it demonstrates your analysis and design skills!</p> <p>Hope that helps,</p> <p>Kind regards</p> <p>Karl</p>
<p>Sun 16/05/2021 13:50</p>	<p>That’s great Kyan, glad it was useful, please get in touch if there is anything specific I can help with – it is mostly a case of making use of the tools that Word provides...</p>

	<p>Kind Regards,</p> <p>Karl</p>
<p>Thu 03/06/2021 11:38</p>	<p>Hi Kyan,</p> <p>That's a good question. I raised the "roles" issue in case of two possibilities - firstly in case you have the help of other people who would carry out some roles, so it is worthwhile explaining how the roles are split between yourself and other people; and secondly if the different roles that you have to play come into conflict.</p> <p>If neither of things actually occurred then you don't have to discuss roles, other than to acknowledge that you understand them, so it really depends whether you have anything to talk about related to them.</p> <p>Your suggested structure looks fine.</p> <p>Hope that helps,</p> <p>Kind regards,</p> <p>Karl</p>
<p>Sunday 20/06/2021 10.11</p>	<p>Apologies Kyan, and thanks for the reminder – those are good questions to ask.</p> <p>The bulk of the report is expected to be formal, although the reflection part can obviously be a bit more personal, and is usually better for it!</p> <p>The analytical / vs informational does depend a bit on the project but you do really need to cover both aspects to some degree – for example you obviously have to say all the things that you have done (informational) but you also need to explain why you made the decisions that you did; and also maybe what you would have done differently and where you would go next, which is more analytical.</p>

	<p>Again, the voice to use is up to you, what you suggest will work, and does have the advantage of clearly separating the report from the reflection; but it is also perfectly reasonable to use “I” throughout since it is clearly an individual project. You certainly wouldn’t lose marks either way, there is no specific requirement.</p>
--	---

I hope that helps,

Kind Regards,

Karl