

UNIVERSITY OF PLYMOUTH

SCHOOL OF ENGINEERING COMPUTING,
AND MATHEMATICS

COMP 3000: FINAL YEAR
PROJECT 2020/2021
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PLYMOUTH ROOM / APPOINTMENT BOOKING
MANAGEMENT

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First and foremost, I want to express my gratitude to my supervisor, James Hayter, for his help and direction during this project. In addition, I want to thank my family, particularly my mother, for their unwavering support and encouragement during my degree.

ABSTRACT

This report discussed about the project management process implemented to complete our room booking and appointment management system for the university of plymouth project. This report outlines the background of the project vision, the project objectives, and the process of delivery by using technology such as HTML, CSS, EJS, MongoDB as main database and some uses of WebSocket and socket.io that enable communication between two clients following some legal social and ethical issues.

An analysis was conducted showing the models used to build this project and some implementation of UML diagrams of the database, additionally each work needed to be completed by a set of sprints where user requirement and core functionalities needed to be completed.

A discussion was conducted finally to discuss about some overview technologies used and the post-mortem conclusion where we summarised the project briefly and discussed about the future aspect of the project

PROJECT LINKS

YouTube link: <https://www.youtube.com/watch?v=YAAuD0jsYgQ8>

GitHub page: <https://github.com/Eyo123/FinalY3000project>

Word count :10011 words

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1-INTRODUCTION

1.1 BACKGROUND

In the United Kingdom, there are approximately 2.38 million university students (Higher education in numbers, 2021). Due to the current pandemic, which is the covid -19 many schools stopped working offline and some university took the resolution to work in an online environment meaning assessment were meant to be delivered regardless of the SITUATION. Most students had a difficult time working at home and when the school reopened some room and available space were closed making the learning process difficult (Voxeu.org,2021). A solution needed to be applied, leading to the creation of Plymouth Room and appointment booking management. This web application will help students at the university to see the list of available room at the university, registered new student and especially book a room or an appointment at the university. The following report describes the approach and development process implemented to develop the process and some strategy and test taken to ensure the quality of the software.

1.2-PROJECT OBJECTIVES

The aim of this project is allowed students and staff or any user from the university of plymouth to book a room or an appointment at the university. the objectives implemented are:

To follow first the agile project management techniques and build the application within the time allocated

To create a functionality that will enable communication between many clients and staff To build an application that will be useful for the students and staff belonging to the university of plymouth

To build an application that will allow client to book a room and an appointment at the university and chose the desirable room of their choice

To Conduct some test to the application before delivery to improve the application. (Agile project management, 2021).

1.3 DELIVERABLES

Plymouth room and appointment booking management is a web application build for students and staff or any user from the university of plymouth to book a room or an appointment at the university using technologies such as HTML,CSS,EJS , Node.js and travis.ci ,Additionally as a database MongoDB and a WebSocket function that will enable communication between two clients .The project will be delivered with a guide instructing the user on how to use the application and a project report documenting the whole research design and development process .

2- LSEP / LEGAL SOCIAL AND ETHICAL ISSUE

2.1- Legal

Plymouth Room and appointment booking system was build following the LSEP, legal social and ethical issues, it was important for us to ensure the protection of each user of the application. Personal information is being collected to carry out responsibilities resulting from any agreements you have entered, to provide you with marketing information about services and products offered across Legal& General group, to notice you about changes to our services and products and to run a business in a convenient way. (General, L., 2021).

2.1.2. General Data Protection Regulation

As mentioned GDPR (2021), General Data Protection (GDPR) are the guidelines existing among the European union law, it defines how information should be protected, processed, and stored. This regulation lays down rules relating to the protection of people by processing personal information relating to the free movement of it, it also protects fundamental rights and freedoms of user. GDPR was built around core principles

- **Principles relating to process personal data**

Processed lawfully, fairly and in a transparent manner, personal data may be stored for longer periods, accurate, relevant, and limited related to data minimisation.

- **Lawfulness of processing**

Processing shall be lawful; processing is necessary for the performance of a contract and for compliance with a legal obligation to which the controller is subject. processing is necessary for the performance of a task carried out in the public interest.

- **Condition of consent**

Controller shall be able to show the viability of data subject that Consented to process the user personal information

- **Integrity and confidentiality**

Appropriate measures must be taken to protect personal information held

- **Accountability**

The product owner must take responsibility of their action regarding the user personal data.

2.3 SOCIAL AND ETHICAL ISSUES

It was important to make sure our software follow the ethical and ethical issue. Granger, M et al (1997) stated, Ethical issues are of concern to the individual, communities and groups, organizations, cultures, institutional sectors, nations, and global populations. Access and equity mean every individual have an equal access to technology, Quality of life covers issues that impact human life.

Data collection from public users must be tolerated in regards of the social and ethical issues. All data from test users are treated with a high protection as per of the University of Plymouth ethic policy, furthermore it is mentioned that all test data was gathered from the University of Plymouth in accordance with the test policy additionally all test users will be notified of the use of data.

2.4 LICENSES & MATERIAL USED

It is capital to ensure that developers have the require permission to use third-party assets, and those assets contains licenses that allow for reuse of the project, a full list of party was showed in appendix 4.

Socket.IO

The library used to handle the socket connections for the messaging side of the application was Socket.IO (Socket.io, 2019). The socket library is under the MIT license (Socket.io, 2018) which states that the library can be used for commercial use, private use, to modify, distribute and sublicense. However, the copyright and license must be included.

HTML/CSS/EJS

using technology such as HTML, CSS and EJS was necessary for a good design and a good user interface as it provides quality to the website. Additionally, using EJS helped me include some equation to include a date functionality and search for a specific date and HTML/CSS was crucial for the styling and the WebSocket chat.

TRAVIS CI/MONGO

Travis CI is a hosted integration service used to build and test software projects hosted on GitHub and Bitbucket.

Travis CI was the first CI service which provided services to open-source projects for free, however free open-source plans were removed at the end of 2020.

Skmeans Node Package

The skmeans dependencies are released under the npm with a MIT license, additionally permission is hereby granted and free of charge to any user granted a software copy

3- PROJECT MANAGEMENT

3.1 METHOD OF APPROACH

3.1.1 AGILE PROJECT MANAGEMENT

To build a project especially in a software development company were many teams need to work together to achieve a specific goal , having a good methodology of work is required .In the past many software engineer were using the waterfall methodology which was a common methodology to used ,however as the world evolve we have noticed that the waterfall methodology is often not viable to use in a large development company , resulting in the change of methodology and the uses of agile methodology , (Alexander, 2021) .

What is agile and why I chose agile

Agile is a project management style that employs sprints, or short development cycles, to focus on continuous product improvement. Agile allows for a shorter turnaround time, streamlined development processes, higher frequency of collaboration and feedback, and, most importantly, easier and faster detection of faults and defects. Agile also allows for optimal project control. In this project, I've combined agile with the scrum methodology, as well as scrum methodologies, which are also part of agile but are more commonly employed in group projects. The Scrum model is constructed on three primary components: roles, process, and artefacts (Rasnacis et al ,2017). There are five primary activities in the Scrum process:

- **the sprint backlog** The sprint backlog is a subset of the product backlog that teams have chosen to work on during the spring. The time will be determined, and the aim will be shown on a scrum board so that everyone can see the development process, and developers will work with that information.
- **the sprint planning meeting** the objective of this part is to define a plan of the project often referred as project vision and how it will be completed, the meeting is held at the beginning of each sprint. In my project because it was a solo development project, I used my supervisor like a team member where I showed him my work and evolution each week.
- **the sprint** the sprint is a basic unit of work for a scrum team this is the main element that differentiate other methodology and scrum.
- **the daily Scrum** the goal of this section is to evaluate the progress and trend until the end of each spring by synchronising activities and creating plan.
- **the sprint review meeting** this section is to demonstrate what work and evolution has been completed regarding the product backlog for future deliveries (Digate,2021)

3.1.2 Trello

Trello was the tool I used for my project management, it is a web based list making application, one the major advantages while using this app it is the flexibility ,it helps you schedule your task into smaller components by using a system boards and cards following the Kanban system .when comparing to other management tools trello has a less complex pricing structure , furthermore trello is available on every platform .However trello cannot handle big projects including many teams because of its storage limit which is 10MB per upload file.(Software-developer-India, 2021).

By using trello I was able to manage my project effectively and keep each spring and stages updated.

3.1.3 SUPERVISOR MEETING

During this project each students had to select one supervisor that will help in the development of the project, every 2 weeks I had a meeting with my supervisor. I had to show him my progress during each sprint, additionally showed each progress I made on the software. Using this methodology helped me keep the rhythm and improve some functionality of the project.

Furthermore, he helped me in the project vision and gave me many ideas of some functionality that will be suitable for a final year project. When I experiment some issues other coursework, we set up a nice time management for each coursework.

3.2 TECHNOLOGIES STACK

3.2.1 MongoDB

(Kang,2015) MongoDB is a cross platform and document-oriented database that provides high performance and easy scalability it works with the concept of collection and document. MongoDB is developed by MongoDB Inc and licensed under the server-side public license. A collection is a group of MongoDB documents is a document-oriented NoSQL database that offers high performance and scalability. Contrary to MYSQL its data structure is designed independently and used JSON as format. Using flexible document schemas.

3.2.2 Node.js

Node.js is a software platform that is built on Chrome's V8 JavaScript runtime for building scalable network applications effortlessly. (Js,2020)

It utilises an event-driven, non-blocking I/O model that makes it more flexible and efficient, perfect for data-intensive real-time applications that run across distributed devices. Node.js is system software of the server-side type developed to write scalable web applications, especially web servers. Node.js was created by Ryan Dahl in 2009 and its development and

maintenance are sponsored by the Joyent company. Node.js contains a HTTP server that makes possible the running of a web server that allows better control over the web server.

NPM: NODE PACKAGE MANAGER

The Node Package Manager (npm) is a utility bundled with Node.js that offers a set of publicly available, reusable components, available through easy installation via an online repository, with version and dependency management.

3.2.3 WebSocket and socket IO

Rădescu, R et al (2013) define socket.IO as a library that enables real time communication between the client and the web servers using a WebSocket protocol to provide interface. that Socket.IO has the goal of making the applications in real time possible in any browser and mobile device. Socket.io contain two components, one on the server part which is node.js and one on the client part referred as browser.js. WebSocket is the communication protocol providing a bidirectional communication between client and server over a tcp connection, when a specific user pulls a request to the server, it wait until the server terminate its request before processing, one of the key features of WebSocket it helps in transforming cross platform in a real time world between server and client and it stands over an HTTP connection providing a full duplex communication. (Socket.io, W,2021).

3.2.4 VERSION CONTROL

This project's version control system was GitHub, which, according to (Kalliamvakou *et al*, 2014), has more than 10 million commits in 2014, making it the world's largest code hosting site. GitHub has become a popular choice among software engineers due to its popularity and the development of integrated social capabilities. Over the years, it has included a "fork & pull" technique, which allows developers to fork a repository and submit a pull request to have their changes merged into the main branch. According to (Borges *et al*, 2016), GitHub is the world's largest open-source software repository, with over 9 million users and 17 million public repositories. It's free and open source, and it's a wonderful backup where different developers may collaborate.

3.2.5 DEVELOPMENT PIPELINE(DevOps)

DevOps is a collaborative strategy that integrates the development and operations teams in a software company, and it is a collaborative approach that unifies the development and

operations teams in a software company. (Khan,2020). It is a concept that alters how teams collaborate to reach a common purpose. These are the benefits of implementing DevOps, Plutora (2021)

- **Speed**

The amount of time it takes to test a project is determined by the availability of a testing environment. Devops speeds up the delivery of software and ensures that it is well-modified through automated testing and integration. • Cooperation DevOps mindset is mostly based on lean and agile software development approaches, and it encourages teams to collaborate to reach a common goal.

- **Quality**

When developing software, it's critical to make sure it's of high quality, and DevOps may help you do so, as seen in Appendix 3. It makes testing a central part of the SLDC and assigns accountability to all users.

Customer satisfaction

One of the fundamental benefits of DevOps is that it improves customer experience by offering feedback loops that allow end users to watch the progress of the application build at various stages and present them with adjustments.

3.2.6 JAVASCRIPT

JavaScript is an object-oriented computer programming language used to build iterative effects within the web browser, it is a scripting language that enables you to create dynamic content. The JavaScript language is widely used for online programming and, increasingly, for general purpose computers (Richard, G *et al* (2010). Because of its speed, JavaScript is highly suggested for use. It may be run instantly within the client-side browser and is unaffected by network connections to a backend server. JavaScript is notable for its interoperability, which allows other languages to be used alongside it, as well as the ability to develop sophisticated interfaces.

4-ANALYSIS AND DESIGN

4.1. ARCHITECTURE SYSTEM

The models used for my project was The MVC architecture, standing for Model, view, and controller. As showed in figure 1.

The model represents a set of data that control access, it is often used as “software approximation” in software industry. his roles are to encapsulates application state, respond to the query, expose application function, and notify views of change. (Dev,2011)

The view specifies precisely how the model should be displayed and presented. the view has for roles to update the model data change, and this is only possible by using a push model. The controller translates the users' interactions with the view into actions performing by the model. In software industry user interaction sometime appears as GET and POST HHTP request while in a GUI environment, they appear to be a menu selection, or a button click. Figure 2 showed some MVC implementation.

I decided to use this model because MVC architecture give the ability

- **to provide multiple views**
- **it supports asynchronous technique:**

The MVC architecture can also work with some JavaScript framework, meaning an MVC application is able to work with desktop widget, PDF files helping the developers to develop an application that load extremely fast.

- **MVC model return the data without formatting**
- **Modification does not affect the entire model because models do not depend on the views**
- **Finally, it provides a faster development process**

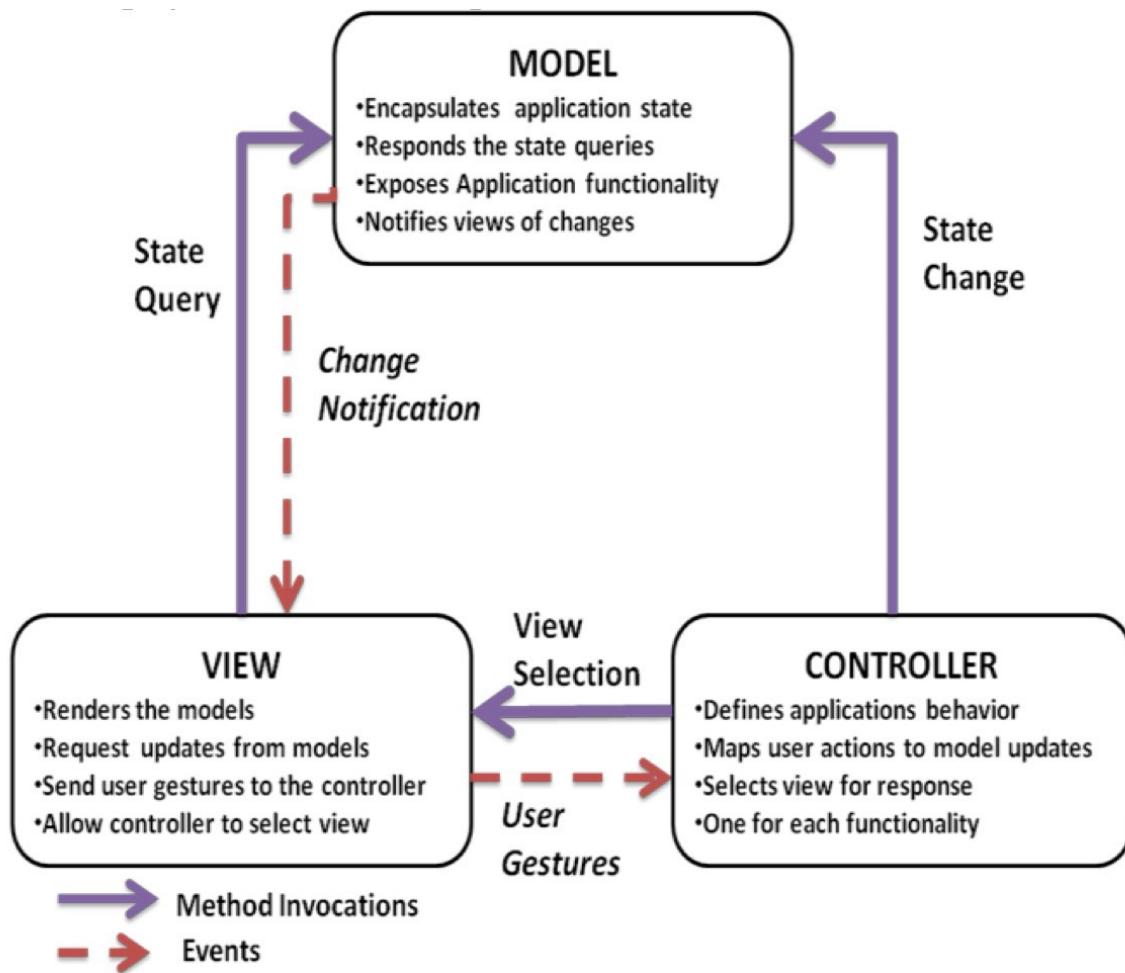


Figure 1: MVC IMPLEMENTATION

```

▼ └─ comp3000project ~/comp3000project
    ├─ models
    ├─ node_modules library root
    ├─ public
    ├─ routes
    ├─ views
    ├─ webs
    └─ .travis.yml
        └─ package.json
        └─ package-lock.json
        └─ README.md
        └─ server.js
  
```

Figure 2: MVC models in my project

4.2. Server and Database

I used in my project many servers to display my application, Richardson et al (2008) stated, server is a representational state transfer often referred as a REST API, using these systems actions are defined using HTTP Verbs such as POST, GET, PUT and DELETE and the architecture style are defined through an URI.

As Database MongoDB was selected for the application according to MongoDB, (2021), MongoDB is a document database specialise in the storage of data in JSON. Győrödi et al (2015) affirmed that, MongoDB provide a lower execution time than MySQL and this is useful when an application needs to provide helps for many users simultaneously and his analyse demonstrate that Mongo have a good performance than MySQL.

The screenshot shows the MongoDB Atlas interface. At the top, there are tabs for 'coursework', 'Atlas' (which is selected), 'Realm', and 'Charts'. Below the tabs, there's a sidebar with 'Advanced' settings and a 'Network Access' section. The main area displays the 'test' namespace with a 'namespaces' dropdown. Under 'test', there are four collections: 'appointments', 'buildings', 'collection_test', and 'students'. The 'appointments' collection is currently selected. At the top of the main content area, it says 'COLLECTION SIZE: 314B TOTAL DOCUMENTS: 2 INDEXES TOTAL SIZE: 36KB'. Below this are buttons for 'Find', 'Indexes', 'Schema Anti-Patterns', 'Aggregation', and 'Search Indexes'. A 'FILTER' bar contains the query '{ "filter": "example" }'. The results section is titled 'QUERY RESULTS 1-2 OF 2' and shows two documents:

```
_id: ObjectId("60b28626e61571573dab455")
appID: "appointment1"
building: ObjectId("60b21d984cf00d0fc59f8e12")
student: ObjectId("60b249ccda2621e7989459")
appdate: 2021-07-30T00:00:00.000+00:00
description: "covid-19"
createdAt: 2021-05-29T18:21:26.178+00:00
__v: 0

_id: ObjectId("60b286492e61571573dab457")
appID: "appointment2"
building: ObjectId("60b24b64e8ff9a7121ef70755")
student: ObjectId("60b21dfa4cf00d0fc59f8e1d")
appdate: 2021-05-22T00:00:00.000+00:00
description: "hi"
createdAt: 2021-05-29T18:22:01.355+00:00
__v: 0
```

Figure 3

4.3 UML DIAGRAM

UML is a diagram based on the unified modelling language that aims to visually portray a system, along with its primary actors and roles, for better understanding. It is based on the use of visual representations to portray software components in diagrammatic form. There are various varieties of UML diagrams, each of which serves a particular function, and it is mostly used as a general-purpose modelling language in software engineering modules. Furthermore, behavioural UML diagrams and structural diagrams are the two most utilised categories. (Tallyfy.2021).

In figure 4 I have showed some uses of the UML diagram in our project this a diagram explaining the component of my MongoDB database.

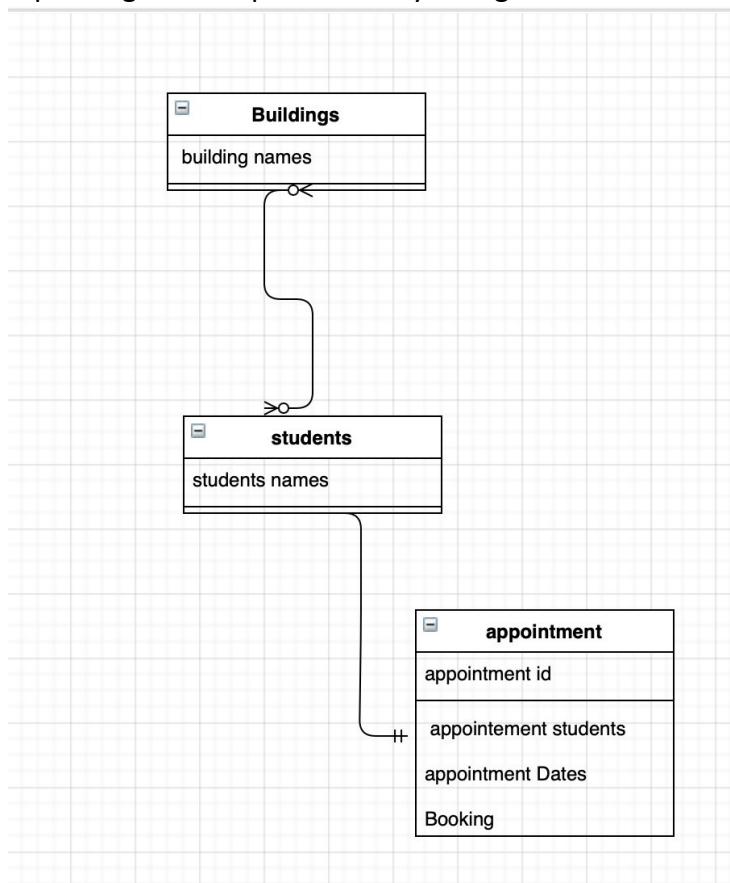


Figure 4: MONGO DB UML DATABASE

5- REQUIREMENTS

The requirement in this field outlines each functionalities needed to complete the project. Priority one means the following requirement is the core functionality of the code and must be in the system, number two and three mean it is important but at the same time not necessary, finally number four mean the functionality added will act as a bonus to the code.

Functional requirement

Priority 1/Requirement

- The user should be able to access the main page, which contains all the necessary information for booking.
- As a student, a user should be able to enrol in classes.
- The user should be able to access the main page, which contains all the necessary information for booking
- A user should be allowed to sign up for classes as a student.
- The user should be able to modify, view, and delete the buildings and information that have been added.
- The user should be able to see a list of appointments and rooms that have been reserved.
- The user should be able to reserve a room or make an appointment.
- The user should be able to look for an appointment or a room.
- The user should be able to set an appointment date.
- The user should be able to choose their own name.
- The user should be allowed to enter their appointment number
- Web socket chat should be available to users.

Priority 2 /Requirement

- Students should have access to their profile and account information, which they should be able to read, edit, and delete.
- The user should be able to see a list of students who have signed up
- Buildings should be able to be added by the user
- A list of buildings should be visible to the user
- The user should be able to view certain building
- User should be able to join chat room

Priority 3/Requirement

- Students should be able to be found by the user
- Description should be able to be entered by the user

- Description should be entered by the user
- The user should be able to look up appointment dates online.

-

Priority 1 / User requirement

- The user will be able to access the main page, which will have all of the necessary information for booking
- The user will have the option to register as a student.
- The user will be able to modify, view, and delete the buildings and information that have been added.
- The user will be able to see a list of scheduled appointments and rooms.
- The user will be able to reserve a room or an appointment.
- The user will be able to look for an appointment or a room.
- The user will be able to enter the appointment date.
- The user will be allowed to choose a name.
- The user will be able to choose from a variety of structures.
- The user will be able to enter their appointment number.
- Users will be able to communicate using a web socket.

Priority 2 / User requirement

- Students will have access to their profile, as well as the ability to amend and delete their information and create a count.
- The user will be able to see the list of students who have signed up.
- Buildings will be possible to be added by the user.
- The user will be able to see a list of construction sites.
- The user will be able to view certain building.
- Users will be able to participate in a chat room.

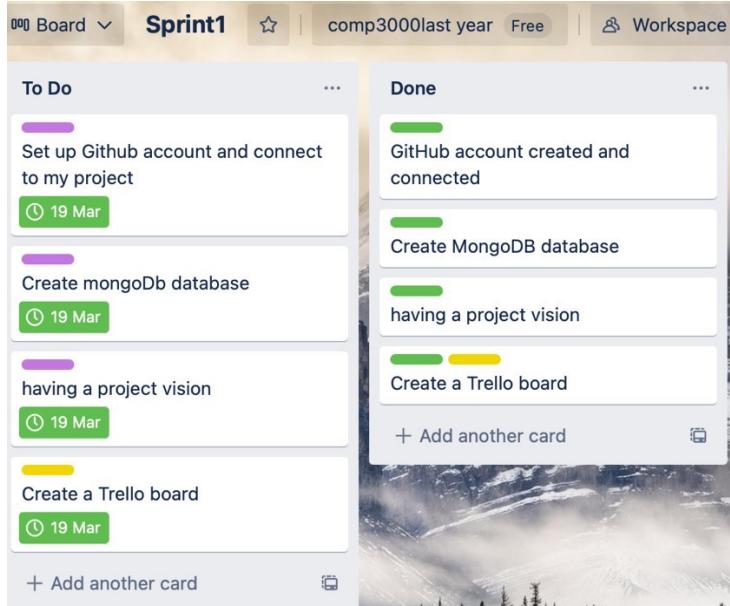
Priority 3 / User requirement

- Students will be searchable by the user.
- The user will be able to add a description to their item.
- The user will be able to look for an appointment date.

6- SPRINT

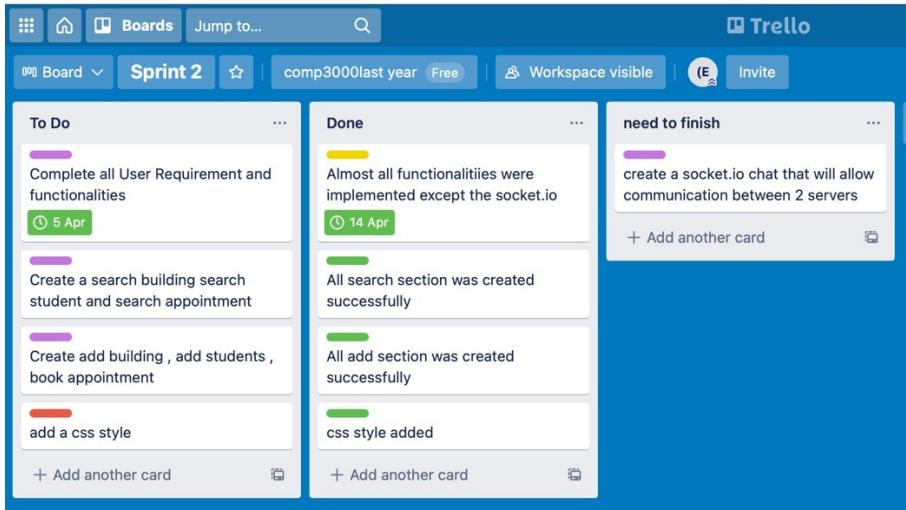
At the end of each sprint, a review was conducted including a summary of actions and the list of features developed.

6.1 -SPRINT 1

Duration	18 March 2021 – 22 March 2021
Sprint Backlog	 A screenshot of a Trello board titled "Sprint1". The board has two main sections: "To Do" and "Done". <ul style="list-style-type: none">To Do:<ul style="list-style-type: none">Set up Github account and connect to my project (Due 19 Mar)Create mongoDb database (Due 19 Mar)having a project vision (Due 19 Mar)Create a Trello board (Due 19 Mar)Done:<ul style="list-style-type: none">GitHub account created and connectedCreate MongoDB databasehaving a project visionCreate a Trello board
Summary of actions	The aim of sprint 1 was to have a project vision, a foundation needed for future development of the project. A project vision, a GitHub and the mongo DB were created. Additionally, it was crucial to connect the GitHub account to the project.

Features Developed	<ul style="list-style-type: none"> ❖ GitHub account Created ❖ MongoDB Database Created ❖ Sprint 1 Trello Board Created ❖ Project Vison Created
Difficulties	<ul style="list-style-type: none"> - Choosing a Project was a bit tricky at this stage I had a lot of projects in my mind and selecting one was challenging - I had to decide which database was convenient between SQL and MongoDB and I found MongoDB more suitable to use.

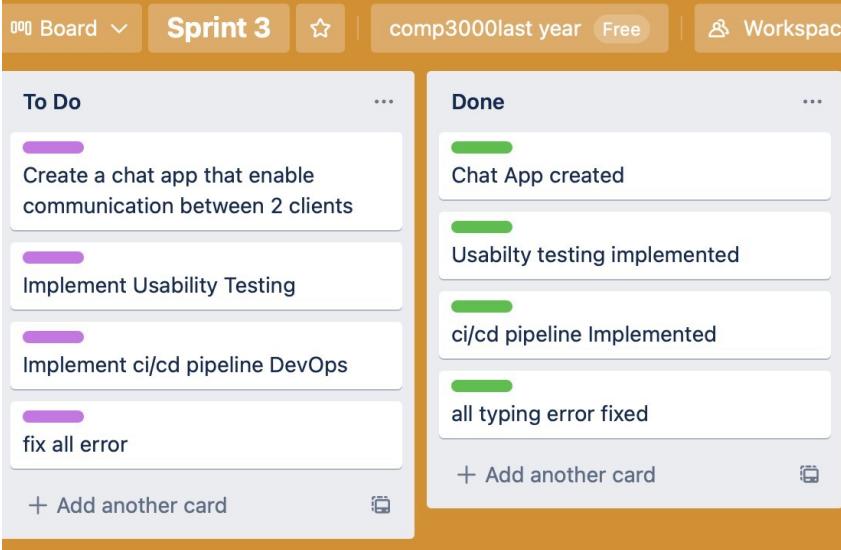
6.2 -SPRINT 2

Duration	4 April 2021 – 20 April 2021
Sprint Backlog	 <p>The screenshot shows a Trello board titled "Sprint 2". The board has three columns: "To Do", "Done", and "need to finish".</p> <ul style="list-style-type: none"> To Do: <ul style="list-style-type: none"> Complete all User Requirement and functionalities (Due 5 Apr) Create a search building search student and search appointment Create add building , add students , book appointment add a css style Done: <ul style="list-style-type: none"> Almost all functionalities were implemented except the socket.io (Due 14 Apr) All search section was created successfully All add section was created successfully css style added need to finish: <ul style="list-style-type: none"> create a socket.io chat that will allow communication between 2 servers

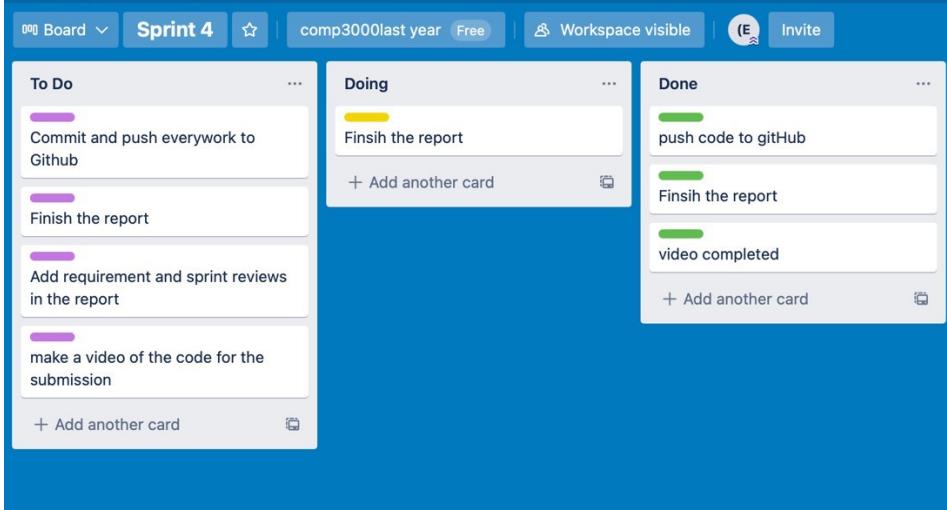
Summary of actions	<p>The aim of sprint 2 was to complete all functionality of the web app and ensure every functionality working perfectly for the user to book a room/appointment and for the admin to see each booking.</p> <p>Additionally, make sure all information was saved to Mongo and Trello board was updated.</p>
Features Developed	<ul style="list-style-type: none"> ❖ Student was able to register, search building and book an appointment ❖ Admin was able to see List of students, List of buildings, list of Appointment Booked
	<ul style="list-style-type: none"> ❖ Sprint 2 Trello Board created ❖ Core functionality was implemented and connection to MongoDB Database was a success
Difficulties	<ul style="list-style-type: none"> - Overall, it was a bit Difficult because I encountered many errors when I was coding the booking appointment part, Initially I wanted to include a picture (required: true) for this part, so that student will be needed to post their picture, for the school to differentiate each student. However, I decided it was not necessary because some students will not be comfortable using it - I did not have the time to implement the web socket.io chat because I had two coursework to submit, so timing was an issue.

6.3 -SPRINT 3

Duration	28 April 2021 – 6 May 2021
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Sprint Backlog	
Summary of actions	The aim of sprint 3 was to finish all functionality, complete the web socket app and to implement many testing on the web app once completed, by implementing a ci/cd pipeline on the code and some usability testing, furthermore, fix all bugs and error the user can face while using the app.
Features Developed	<ul style="list-style-type: none"> ❖ WebSocket chat app implemented, allowing communication between two Clients. ❖ user will be able to enter a room and chat ❖ ALL error fixed, Error while choosing the Date fixed and edit appointment error fixed ❖ Sprint 3 Trello Board Created ❖ All functionality worked perfectly and saved to the database.
Difficulties	Overall, during this sprint, I managed to end all task successfully without major difficulties, During the testing a user told me he had problems choosing a date to be more precise when he was selecting when he was selecting the date, the website did not refresh and displayed an error message. I was able to fix it and the user was able to Book an appointment.

6.3 -SPRINT 4

Duration	14 May 2021 – 29 May 2021
Sprint Backlog	
Summary actions	<p>The aim of sprint 4 was to finish the project, Complete the Report and the video required to submit the report also push the code to the GitHub account and include it in the report.</p>
Features Developed	<ul style="list-style-type: none"> ❖ code push to GitHub ❖ Video completed ❖ Sprint 4 Trello Board Created ❖ Final Report Completed

Difficulties	<p>Initially I had to finish the report last week however I had some covid-19 symptoms on the 5 May 2021, and I had to isolate myself for 1 week and apply for an EC, as soon as I recovered on the 14 may, I started working on the project. I would say that was the most difficult part of this spring.</p> <p>Another difficult part of this sprint was the report, at the beginning it was difficult to find ideas however the more I worked on it, I was able to complete it without major difficulties.</p>
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6.4 -RISK ASSESMENT

During each spring it was necessary to implement a risk assessment, thus risk assessments access existing control measures, ensure additional controls and identify health and safety, to be more specific an effective risk assessment allows company to identify areas of their organisation in which employee were more at risk and provide a well-structured strategy to mitigate those risks.

At the end of each sprint a risk assessment was implemented in my project

SPRINT	Risk assessment
Sprint 1	<ul style="list-style-type: none"> -having difficulties setting up a project vision -inaccessibility to some software features because of the lack of material in my possession due to the university closures and lockdown -possible case of covid-19 -Not be able to submit each sprint on time

Sprint 2	<ul style="list-style-type: none"> --Time management not well organised -many coursework to be completed resulting on late submission of comp3000 -not be able to complete some functionality in the code on time -additional features not implanted on time
Sprint 3	<ul style="list-style-type: none"> -limited users to test the code -travis ci not working for the continuous integration -GitHub commit not submitted on time - possible case of covid 19
Sprint 4	<ul style="list-style-type: none"> -not be able to complete the project report on time -not be able to finish the video on time -inaccessibility of some features due to lockdown -possible loss of data due to an accident

7-TESTING

7.1 USABILITY TESTING

Many tests must be performed to establish the software's eligibility and guarantee that all functionality functions appropriately. In my project, I concentrated on usability testing, which is a crucial skill for professionals by helping product developers. to make their products more user-friendly (Lewis,2006). In this project I have included many scenarios as showed in appendix 3 where we included 14 scenario and each scenario had a set of instruction and a time given, The user finds it easy overall to use the application however

some errors were detected by a user, applying this method help me discover it and a solution was applied to the following error

Scenario 5:

User Story: As a customer, I want to book an appointment

Instruction:

- 1-select appointment 1 as appoint ID
- 2- select piuc building
- 3- select Aliana as name|
- 4-choose the 30/07/2021
- 5-description add covid-19

Time taken:2 min

Which of the following would best describe the difficulty of this task? (<u>check</u> one box)				
Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well
Appointment was booked
What you felt could be improved

Scenario 6:

User Story: As a customer, I want to see list of appointment booked

7.2 CI CD TRAVIS CI

Ci known as continuous integration is a software engineer tools that helped developers integrate their project into a shared machine additionally verify the quality of their project daily and monthly depending on the user's configuration. Using a Ci to help me ensure the quality of my software and every time I was committing a file on GitHub, my document committed was processed and tested by travis Ci Result of experiment was demonstrated in appendix 3.

Beller, et al (2017) stated, TRAVIS CI is an open-source, distributed build service that, through a tight integration with GitHub, allows projects to build and run their CI procedures without having to maintain their own infrastructure.

8- PROJECT-END REPORT

8.1 SUMMARY OF PROJECT

Overall, the project was completed successfully. This Project was built with the goal of producing a web application that will help the students due to the pandemic from the university of plymouth, book a room and an appointment at the university and communicate with the teacher. Though were some challenges during the project, resulting the project to fall behind schedule, The project meets all the core requirement and the sprint, and it was completed successfully.

8.2 OBJECTIVES REVIEW

1-To build an application which allows a client to able to Book an appointment

The goal has been met during sprint 3, The application gives the ability to the user to see the list of room available and book the room. This part was the most crucial part of my function because the whole aspect of the project was to book. Overall, with an intensive sprint work, I managed to complete the task.

2-To build an application which allows students users to register

I have added a functionality to the user and this functionality was set up for the user to register a student or register as a student who want to book an appointment, student was registered to the database alongside with all the students that have applied to book a room. Overall that part was a bit challenging due the lack of time during spring 2, however I manage to fulfil the goal.

3- To have a functionality that will enable communication between 2 clients and admin

The objective was met through sprint 3, in this part it was necessary to implement a WebSocket app that enable communication between two clients. This task was to be completed in the sprint 2 however as mentioned in the sprint review. Others coursework from different modules were to be submitted. Moreover, despite this issue I have reached the goal at the sprint 3 without major difficulties.

4-To implement some testing to the application

My goal during this part was to apply a ci/cd pipeline and synchronise my GitHub repository with travis ci and to conduct a usability testing to different users by giving them a set of scenario and list of instruction to complete. Overall testing was a success and this part help detecting some error and feedbacks from users helped me improved the project.

5- To have a good project management and build the application within the time allocated

To succeed a project, it is capital to have a good project management. Although some

sprints within the application fell behind the schedule, the application was completed within the time given for the project.

8.3 SOME CHANGES MADE

- **Using MongoDB instead of MySQL**

Initially I wanted to use my SQL database for the project, because this is the software, I was more comfortable using, however during this time in comp3006 we have learned MongoDB and the benefit of using it, Learning Mongo for me was very exciting, I found MongoDB more suitable and comfortable to use.

- **Using WebSocket instead of the track and trace**

It was a possibility to include a track and trace application however I found it necessary to include a chat functionality and a forum where users will be able to communicate and share their frustration and complain to the admin.

- **Delete the image functionality to the app**

To book a room, each students needed to post a picture of themselves to be recognised by the university, furthermore I noticed that some user might just want to book a room without being too confidential and I finally decided to remove this functionality as many users will not be comfortable with it.

9- PROJECT POST-MORTEM

9.1 PROJECT MANAGEMENT APPROACH

Using agile methodology and scrum was the best approach for this project and allowed me to make my development iterative and any changes to the project were easy to resolve. I decided to use a bit of scrum especially for the springs.in my case even if it was an individual coursework due to others coursework, I find it necessary to combine both methodologies.

9.2 TECHNOLOGIES EVALUATION

- **HTML/CSS/EJS**

To develop the web application, using technology such as HTML, CSS and EJS was necessary for a good design and a good user interface as it provide quality to the website. Additionally, using EJS helped me include some equation to include a date functionality and search for a specific date and HTML/CSS was crucial for the styling and the WebSocket chat.

- **MONGODB/ NODE.JS**

MongoDB and node.js was an appropriate choice especially for the backend user system and a solid database. node.js helped me run the project at a specific server, which allow more flexibility and helped me implementing a socket.IO system.

9.3 BEST ASPECTS

One of best aspect of the application in my opinion was the flexibility of the app to allow the user to add a specific room of their interest and be able to book , also the ability for the users to chat with another user and an admin via the plymouth R/A chat function were user are able to join multiple room and chat together .Finally the fact that I have implemented a continuous integration on the project via travis CI ,conduct a usability testing and had a good project management for my project .

9.4 FUTURE WORK

Plymouth Room/Booking Appointment was designed initially to help the students from the university of plymouth, now the main goal will be to present my project to the university and obtain some feedbacks about it on how I can improve the project, submit a questionnaire for the people and obtain any feedbacks. Add more functionality such as a Track and trace app due to the covid-19 and a geo localisation function to see the location of each building.

10- CONCLUSION

The goal of the project was to create a room/appointment booking system which could help the user to book a room or an appointment at the university of plymouth. Overall, the project has achieved all the core objectives and requirement set out for the project. Although I faced some challenges during the development of the project, Due to a good project management, in our case the uses of agile methodology help us delivered the project with every functionality completed. In the future It is intended to develop the application, presented to plymouth university and eventually the project will finally become an application where students and teacher will use it as a main tool to book a room or an appointment at plymouth university.

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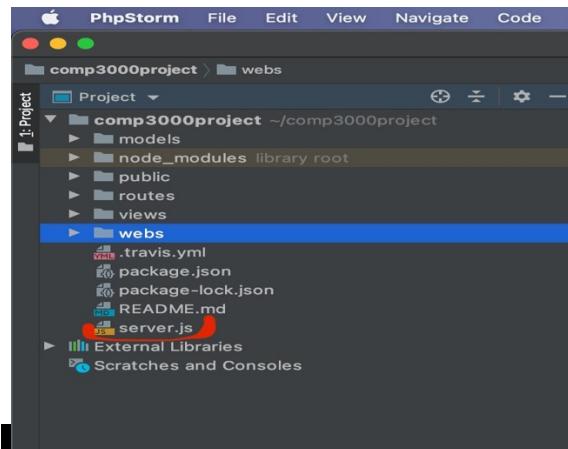
12- APPENDICES

Appendix 1: User Guide

Below is a step guide of how to use Plymouth Room/ Appointment app

a-How to start the application

To start the application, you first must open comp3000 Project depending on the platform of preference, in my case I use PHPstorm (figure 5), then there is a directory named webs containing another



server.js running at port 5000.

Figure 5
in Figure 6 and 7.

Finally, to launch the application you double click on both server.js and then click on Run as showed

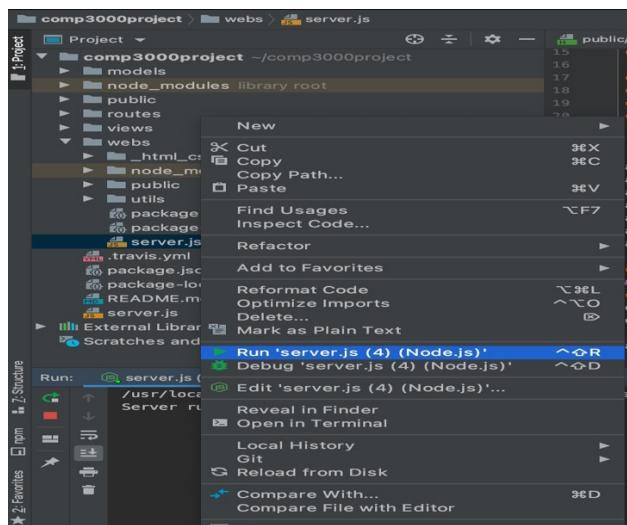


Figure 6

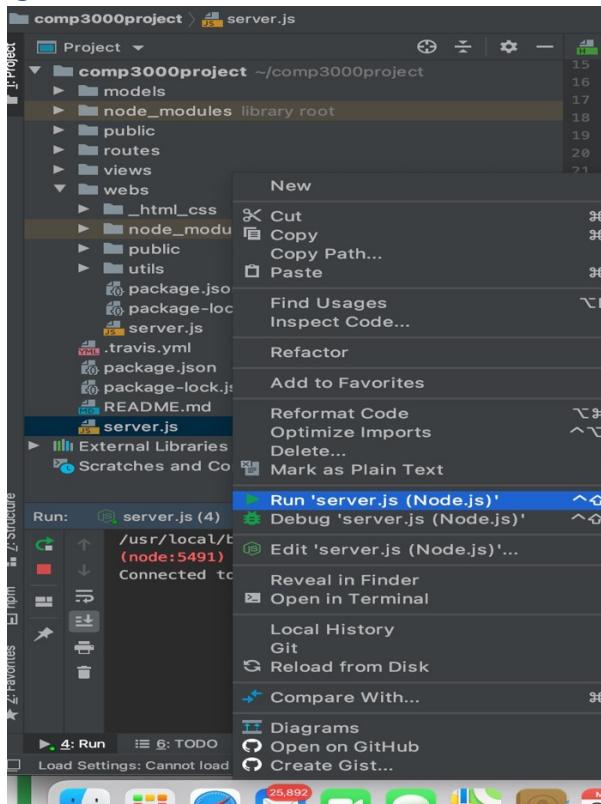


Figure 7

b- Understand the functionality of the app

When you Launch the application, The main page will be present as follow, each section represents a function for a user to fill. User will be able to add new building, search for a building, register a student, search for a student, see a list of appointment, book an appointment or a room and finally chat with another user using the same app see figure 8.



Figure 8

C-How to use the application

First step: Add new building, view, edit, search and delete

When select this function, you will see a search bar where you can insert the name of the building that is available see figure 9, In our case we will add Babbage building, Psquare and Rolland building. once you type the name press the button created, automatically your buildings will be updated to the app, and you will be able to see the list of buildings in the section search building (figure 10).

Additionally, let's look at Babbage building as you can see, we are able to edit view and delete let's edit Babbage building and change the name to piuc building (figure11). Babbage has been changed to piuc, if you want to search for a specific building, you can type the name of the building and the app will showed the element you have searched for if existing. The final step will be to delete a building and we will delete Psquare building (figure12,13).

Plymouth Room/Appointment Booking

Add new Building Building search Student Registration search student Appointments LIST Booking Plymouth R/A Chat

Search Buildings

Name	Search
Babbage Building	View Edit Delete
PSQUARE Building	View Edit Delete
rolland Building	View Edit Delete

Figure 9

BOOKING

Add new Building Building search Student Registration search student Appointments LIST

Babbage Building

[Edit](#) [Delete](#)

Figure 10

Plymouth Room/Appointment Booking

Add new Building Building search Student Registration search student Appointments LIST Booking Plymouth R/A Chat

Edit Building

Name	Cancel	Update
psic Building		

Figure 11

Search Buildings

Name

piuc Building

PSQUARE Building

rolland Building

Figure 12

BOOKING

Add new Building Building search Student Registration search student Appointments LIST Booking Plymouth R/A Chat

Search Buildings

Name

piuc Building

rolland Building

Figure 13

Second step: Add new students, view, edit, search and delete

At student's registration, user will be able to register himself as a student that want to book an appointment, this step is necessary for the next step, which is to book an application, once the students have been registered, he will be able to see his profile, his name, edit, delete, and search for his information.

As an example, we will select the name ALIANA and create her folder, the user will be able to see Aliana profile edit if needed and delete his/her profile figure 14,15.

Plymouth Room/Appointment Booking

Add new Building Building search Student Registration search student Appointments LIST Booking Plymouth R/A Chat

New Student

Name
ALIANA

Figure 14

BOOKINGS

Add new Building Building search Student Registration search student Appointments LIST Booking Plymouth R/A Chat

Search Students

Name

roberto	<input type="button" value="View"/>	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>
ALIANA	<input type="button" value="View"/>	<input type="button" value="Edit"/>	<input type="button" value="Delete"/>

Figure 15

Third step: book and search for an appointment

Once building and students has been added, you can select the booking function. To Book you must first add an appointment ID, this step was necessary to identify each student's appointment, select your name and building available. It was necessary to add students and building so. That if a new user come, he will see the list of students and building available. furthermore, you select the date you want to book the appointment and finally add a description about the reason of your booking.

As an example, let's select as

Appointment ID: appointment1

Name: ALIANA

Date: 30/07/2021

Building: Piuc Building

Description: covid-19

Appointment ID: appointment2

Name: Roberto

Date: 22/06/2021

Building: Rolland Building

Description: hi

Once you booked both appointment you will be able to see all appointment booked at "list of appointment", You will be able to search for a specific appointment by entering the date of the appointment or using just the appointment ID as showed in Fig 16,17, 18 and 19.

Booking

Add new Building Building search Student Registration search student Appointments LIST Booking Plymouth R/A Chat

Room/appointment booking

appointment ID: appointment1 Building: piuc Building

Appointment Date: 30/07/2021 Student: ALIANA

Description: covid-19

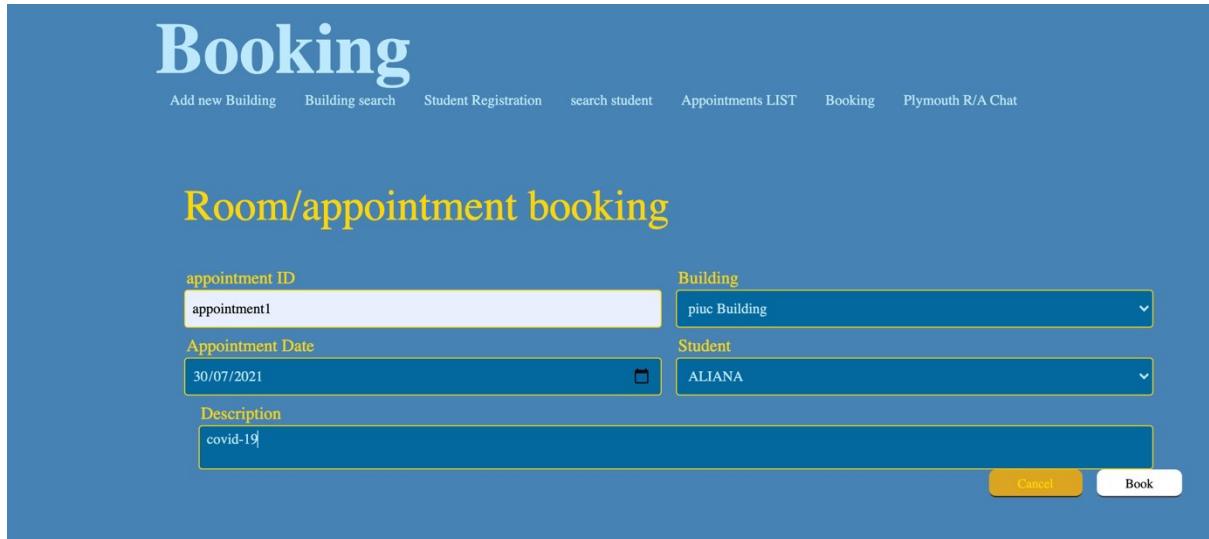


Figure 16

Search Room/Appointment

appointmentID:

(optional) Date when you have created the appointment: dd/mm/yyyy

appointment1

appointment2



Figure 17

The screenshot shows a search interface for room/appointments. At the top, there is a navigation bar with links: Add new Building, Building search, Student Registration, search student, Appointments LIST, Booking, and Plymouth R/A Chat. Below the navigation bar, the title "Search Room/Appointment" is displayed. There are two input fields: "appointmentID" and "(optional) Date when you have created the appointment". The "appointmentID" field contains "appointment1" and the date field contains "30/07/2021". To the right of the date field is a small calendar icon. A yellow "Search" button is located at the bottom right. Below the search area, the results are listed under "appointment1", showing "Edit" and "Delete" buttons.

Figure 18

This screenshot shows the same search interface as Figure 17, but with different search parameters. The "appointmentID" field now contains "appointment2" and the date field contains "dd/mm/yyyy". The "Search" button is again at the bottom right. The results are listed under "appointment2", showing "Edit" and "Delete" buttons.

Figure 19

Final step: List of appointment and chat section

To finally see the list of appointment booked you can also click at Plymouth R/A booking, this will automatically display the list of all appointment booked see fig 17.

Moreover, this application has a chat functionality where users will be able to communicate between 2 clients.

As an example, lets create a username William and Aliana and assign them into Room 3, as you can see in figure 18,19 both names will be displayed in the user's section and the room where they belong and they will be able to chat, leave the Room and return to the main app.

Plymouth Room/Appointment Booking

Add new Building Building search Student Registration search student Appointments LIST Booking Plymouth R/A Chat

appointment booked

appointment2

Edit
Delete

appointment1

Edit
Delete

Figure 20

- Return to main app

Plymouth Room/Appointment Chat

Username

ALIANA

Room

Room 3

Join Chat

Figure 21

- Return to main app

Plymouth Room/Appointment Chat

Username

william

Room

Room 3

Join Chat

Figure 22

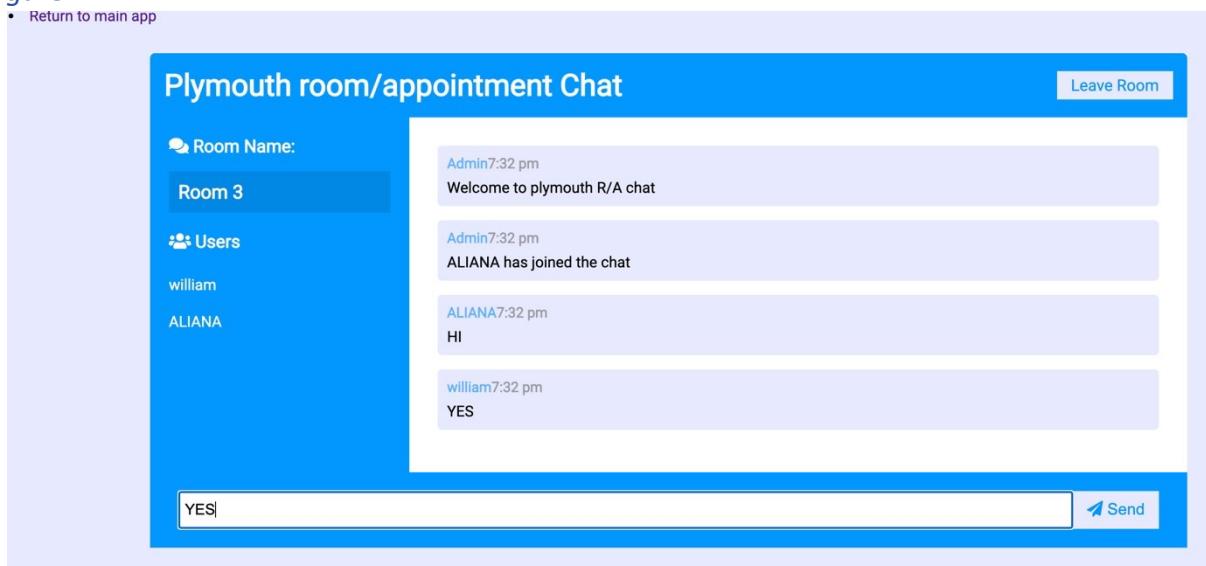


Figure 23

Appendix 2: Project Management

2.a TRELLO BOARD

I used trello to manage my project, I started working on the project on the 19 March 2021, before that I was focusing on comp 3006 and my 2 others coursework, I had a lot of coursework to submit. So due to the lack of time I mainly used this time, and I made the decision to divide this time in 4 intensive sprints where I will work a lot and complete each function.

2.b REQUIREMENT AND SPRINT

Those where the requirement needed to achieve the project, the colour is just to differentiate each priority depending on the difficulties

Functional requirement

- The user should be able to access the main page, which contains all the necessary information for booking.
- As a student, a user should be able to enrol in classes.
- The user should be able to access the main page, which contains all the necessary information for booking
- A user should be allowed to sign up for classes as a student.

- The user should be able to modify, view, and delete the buildings and information that have been added.
- The user should be able to see a list of appointments and rooms that have been reserved.
- The user should be able to reserve a room or make an appointment.
- The user should be able to look for an appointment or a room.
- The user should be able to set an appointment date.
- The user should be able to choose their own name.
- The user should be allowed to enter their appointment number
- Web socket chat should be available to users.

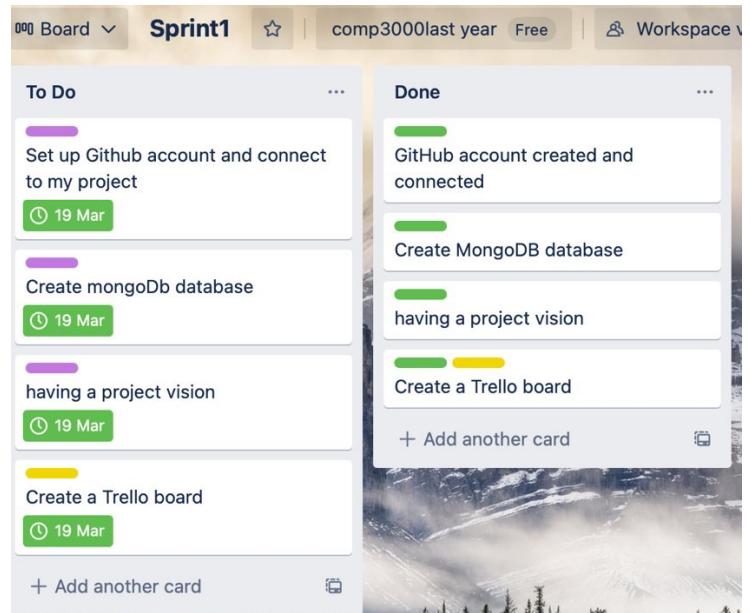
7- SPRINT

At the end of each sprint, a review was conducted including a summary of actions and the list of features developed.

7.1 -SPRINT 1

Duration 18 March 2021 – 22 March 2021

Sprint Backlog



Summary of actions

The aim of sprint 1 was to have a project vision, a foundation needed for future development of the project. A project vision, a GitHub and the mongo DB were created. Additionally, it was crucial to connect the GitHub account to the project.

Features Developed

- ❖ GitHub account Created
- ❖ MongoDB Database Created
- ❖ Sprint 1 Trello Board Created

❖ Project Vison Created

Difficulties

- Choosing a Project was a bit tricky at this stage I had a lot of projects in my mind and selecting one was challenging
- I had to decide which database was convenient between SQL and Database and I found MongoDB more suitable to used.

7.2 -SPRINT 2

Sprint Backlog

Duration 4 April 2021 – 20 April 2021

Summary of actions The aim of sprint 2 was to complete all functionality of the web app and ensure every functionality working perfectly for the user to book a room/appointment and for the admin to see each booking.

The screenshot shows a Trello board titled "Sprint 2". The board has three columns: "To Do", "Done", and "need to finish".

- To Do:**
 - Complete all User Requirement and functionalities (Due 5 Apr)
 - Create a search building search student and search appointment
 - Create add building , add students , book appointment
 - add a css style
- Done:**
 - Almost all functionalitiess were implemented except the socket.io (Due 14 Apr)
 - All search section was created successfully
 - All add section was created successfully
 - css style added
- need to finish:**
 - create a socket.io chat that will allow communication between 2 servers

Additionally, make sure all information was saved to Mongo and Trello board was updated.

Features

Developed

❖ Student was able to register, search building and book appointment

❖ Admin was able to see List of students, List of buildings, list of Appointment Booked ❖ Sprint 2 Trello Board created

❖ Core functionality was implemented and connection to MongoDB Database was a success

Difficulties

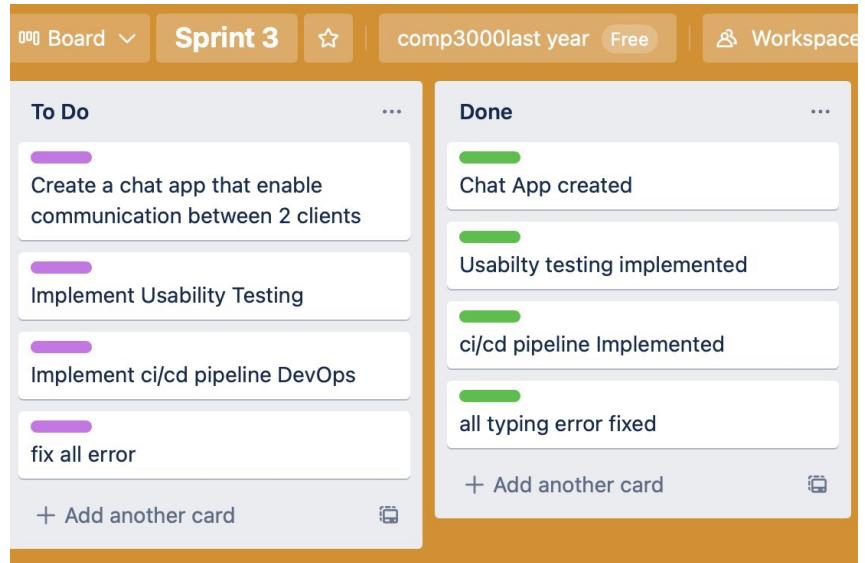
- Overall, it was a bit Difficult because I encountered many errors when I was coding the booking appointment part, Initially I wanted to include a picture (required: true) for this part, so that student will be needed to post their picture, for the school to differentiate each student. However, I decided it was not necessary because some students will not be comfortable using it
- I did not have the time to implement the web socket.io chat because I had two coursework to submit, so timing was an issue.

Sprint Backlog

7.3 -SPRINT 3

Duration

28 April 2021 – 6 May 2021



Summary of actions

The aim of sprint 3 was to finish all functionality, complete the web socket app and to implement many testing on the web app once completed, by implementing a ci/cd pipeline on the code and some usability testing, furthermore, fix all bugs and error the user can face while using the app.

Features Developed

❖ WebSocket chat app implemented, allowing communication between two Clients. ❖ user will be able to enter a room and chat

❖ ALL error fixed, Error while choosing the Date fixed and edit appointment error fixed

❖ Sprint 3 Trello Board Created

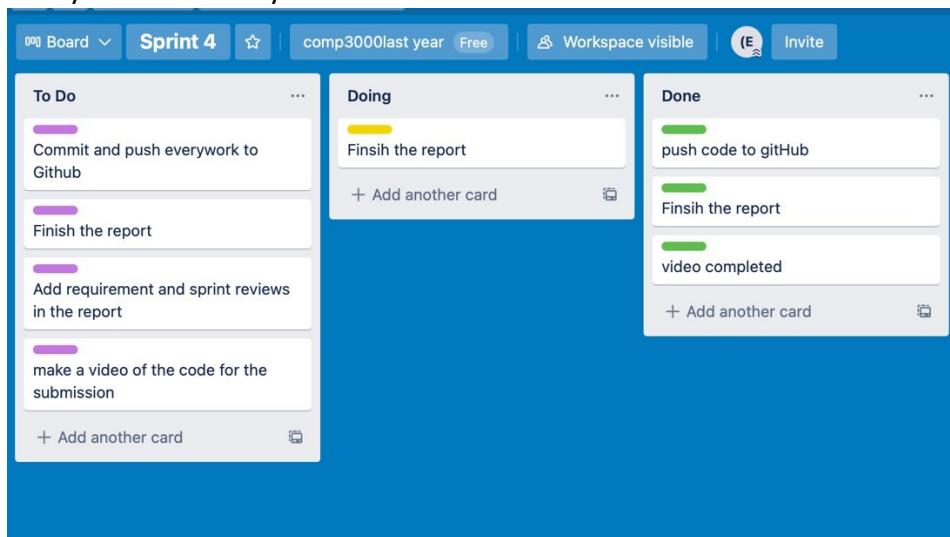
❖ All functionality worked perfectly and saved to the database.

Sprint Backlog

Difficulties	Overall, during this sprint, I managed to end all task successfully without major difficulties. During the testing a user told me he had problems choosing a date to be more precise when he was selecting when he was selecting the date, the website did not refresh and displayed an error message. I was able to fix it and the user was able to Book an appointment.
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7.3 -SPRINT 4

Duration 14 May 2021 – 29 May 2021



Summary of actions The aim of sprint 4 was to finish the project, Complete the Report and the video required to submit the report also push the code to the GitHub account and include it in the report.

Features Developed

- ❖ code push to GitHub
- ❖ Video completed
- ❖ Sprint 4 Trello Board Created
- ❖ Final Report Completed

Sprint Backlog

Difficulties	<p>Initially I had to finish the report last week however I had some covid-19 symptoms on the 5 May 2021, and I had to isolate myself for 1 week and apply for an EC, as soon as I recovered on the 14 may, I started working on the project. I would say that was the most difficult part of this spring.</p> <p>Another difficult part of this sprint was the report, at the beginning it was difficult to find ideas however the more I worked on it, I was able to complete it without major difficulties.</p>
--------------	--

2.c Remote control

For my final year project, I used as a remote-control GitHub where I was committing and adding files once the file was completed, GitHub helped me Identified and structure my project well additionally it helped me connected to travis.ci to add some pipeline and continuous integration to my project.

Link to my Final year project GitHub: <https://github.com/Eyo123/FinalY3000project>

The screenshot shows a GitHub repository page. At the top, it displays 'master' branch, 2 branches, 0 tags, 'Go to file', 'Add file', and a green 'Code' button. Below this is a table of commits:

Mop ao and Mop ao all files updated and all error fixed, travis sync		a5dbc5a 10 hours ago	28 commits
.idea	commit views	4 days ago	
models	add models	4 days ago	
node_modules	commit views	4 days ago	
public/stylesheets	Updated building.css	21 hours ago	
routes	routes directory completed	21 hours ago	
views	added chat in the nav bar	21 hours ago	
webs	all files updated and all error fixed, travis sync	10 hours ago	
.travis.yml	updated both files	11 hours ago	
README.md	Readme file created	21 hours ago	
package-lock.json	all files updated and all error fixed, travis sync	10 hours ago	
package.json	updated package	10 hours ago	
server.js	server running at port 3000	21 hours ago	

Below the commits is a 'README.md' file editor.

On the right side, there are sections for 'About' (no description), 'Releases' (no releases), 'Packages' (no packages), and 'Languages' (JavaScript 38.9%, CSS 24.5%, EJS 23.1%, HTML 13.5%).

2.d Supervisor meetings

Every 2 weeks and sometimes every week, I had a meeting with my supervisor James Hayter, and we were discussing about how and what I should do to improve the project. At the end of each week, it was necessary to show him my progression via Microsoft teams, at each sprint each task had a deadline and a time taken to complete it.

comp3000 meeting



James Hayter
Wed 3/17/2021 9:41 AM
To: (s) Amoata Eyorekon

Sure, no problem.
I set it up for Thursday at 10.

Thanks,
James

This email and any files with it are confidential and intended solely for the use of



James Hayter

Thu 2/11/2021 10:30 AM

To: (s) Amoata Eyorekon

Hi Amoata,
How is your project going?
Can we have a meeting next week, I'm free on Wednesday.

Thanks,
James

Appendix 3: TESTING

3.1 Travis.yml ci/cd pipeline

To test my application, I have used a travis.yml file and connected my GitHub repository to travis. every time I commit a file travis recycle my commit and simplify the code for me.to add the file I insert in the travis.yml file.

language: node_js node_js:

- node

cache: install:

- npm install -g mocha
- npm install chai
- npm install chai-http - npm install express and to add the travis file to my GitHub repository I did git add.travis.yml
git commit -m "added travis file"
and git push origin master

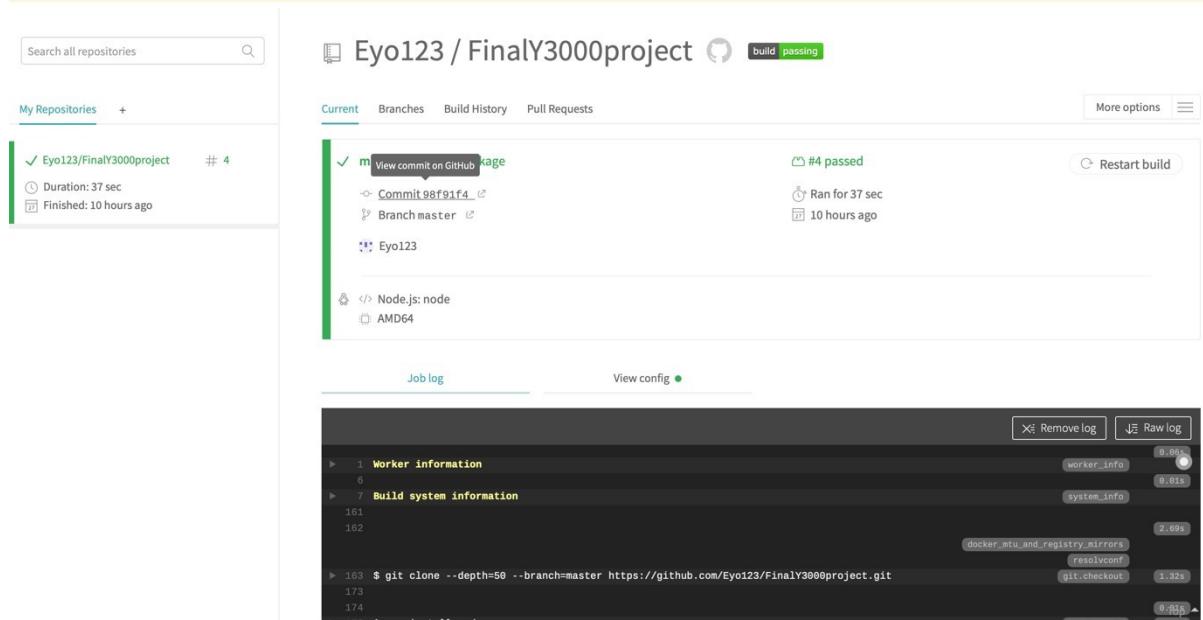


Figure 24

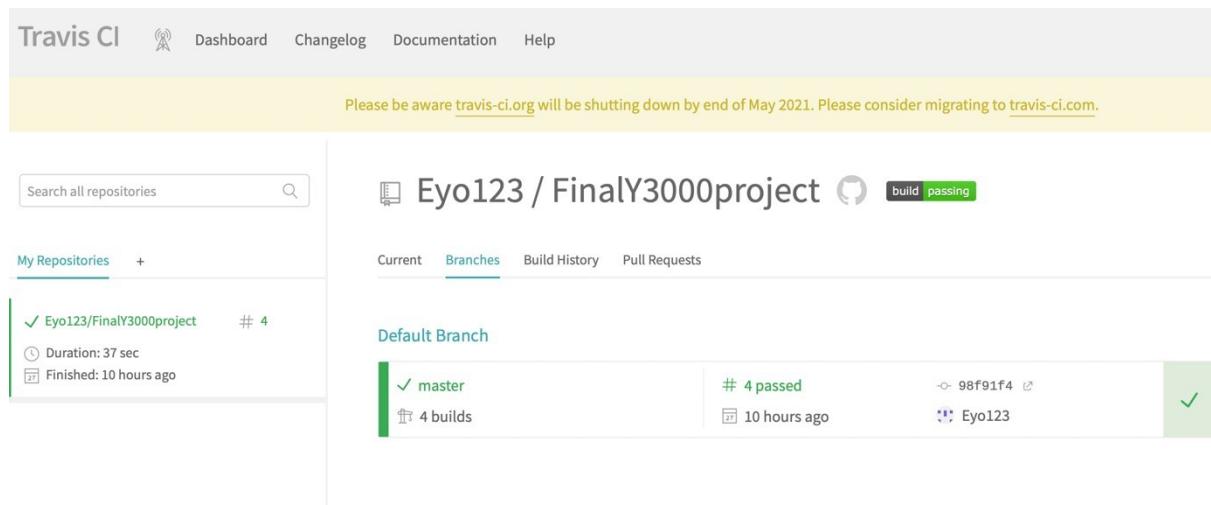


Figure 25

3.2 Usability test

Scenario 1:

User Story: As a customer, I want to add a building

Instructions: select add new building, add in research bar Babbage building and Rolland building

Time taken: 13 s

Which of the following would best describe the difficulty of this task? (Check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well

I was able to add Babbage without any issue

Scenario 2:

User Story: As a Customer, I want to edit building, view and delete a building

Instructions: at search building select view Rolland building edit and change the name to random building and delete Babbage building

Time taken: 1min 3s

Which of the following would best describe the difficulty of this task? (check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well

Babbage has been deleted and I was able to edit and change Rolland to random

What you felt could be improved

Scenario 3:

User Story: As a customer to search for a building

Instructions: recreate another building named piuc, go back at search and type in random building

Time taken: 54s

Which of the following would best describe the difficulty of this task? (check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well

I was able to see random and piuc and search for random

What you felt could be improved

Scenario 4:

User Story: As a customer, I want to register as a student, edit, delete

Instructions:

- 1-create 3 student ALIANA, Roberto and William
- 2-list will be displayed at search student
- 3- search for William
- 4- edit William and change his name to user 1
- 5-delete William profile

Time taken: 2 min 03s

Which of the following would best describe the difficulty of this task? (check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
	x			

What you felt went well

I was able to change everything according to the instruction

What you felt could be improved

I could not delete William at first because he already had an appointment so a message

telling us William had an appointment will be great, other than that it was easy

Other things worth mentioning

Scenario 5:

User Story: As a customer, I want to book an appointment

Instruction:

1-select appointment 1 as appoint ID

2- select piuc building

3- select Aliana as name

4-choose the 30/07/2021

5-description add covid-19

Time taken2 min

Which of the following would best describe the difficulty of this task? (check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well
Appointment was booked
What you felt could be improved

Scenario 6:

User Story: As a customer, I want to see list of appointment booked

Instructions: click on the bar list of appointment

Time taken: 3a

Which of the following would best describe the difficulty of this task? (check one box)				
Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well
It was easy to access it

Scenario 7:

User Story: As a customer, I want to edit an appointment

Instructions:

- 1-select appointment 1
- 2- change the id to app2
- 3 change the date to 22/06/2021
- 4- press book

Time taken: 27s

Which of the following would best describe the difficulty of this task? (check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well

I was able to edit an appointment

Scenario 8:

User Story: As a customer, I want to delete an appointment

- 1- Create an appointment of your choice give the name you want and follow the same process
- 2- Go on list of appointment you will see 2 appointments, your appointment created and app2 and delete one appointment

Instructions:

Time taken: 1 min 16

Which of the following would best describe the difficulty of this task? (Check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
	x			

What you felt went well

Easy to do, I was able to delete app2

What you felt could be improved

Scenario 9:

User Story: As a customer, I want to search for an appointment

Instructions: select the 30/07/2021 you will be able to see the appointment booked on that date

Time taken: 5s

Which of the following would best describe the difficulty of this task? (check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well

It was easy to search, app2 was displayed

What you felt could be improved

Other things worth mentioning

Nice functionality

Scenario 9:

User Story: As a customer, I want to search for an appointment

Instructions: select the 30/07/2021 you will be able to see the appointment booked on that date

Time taken: 5s

Which of the following would best describe the difficulty of this task? (check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well

It was easy to search, app2 was displayed
What you felt could be improved
Other things worth mentioning
Nice functionality

Scenario 10:

User Story: As a customer, I want to search for an appointment

Instructions: select the box app id and type app2, you will see all your information

Time taken: 5s

Which of the following would best describe the difficulty of this task? (check one box)				
Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well
It was easy to search, app2 was displayed
What you felt could be improved
Other things worth mentioning

Scenario 11:

User Story: As a customer, I want to use the chat app

Instructions: select the plymouth R/A chat

Time taken: 1s

Which of the following would best describe the difficulty of this task? (check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well

Easy to access

What you felt could be improved

Other things worth mentioning

Scenario 12:

User Story: As a customer, I want to join a room

Instructions: select the plymouth R/A chat, create a name Aliana and select room 3

Time taken: 13s

Which of the following would best describe the difficulty of this task? (Check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well

Easy to access

What you felt could be improved

Other things worth mentioning

Scenario 13:

User Story: As a customer, I want to communicate with another user

Instructions:

- 1-select the plymouth R/A chat, create another user named joseph or the name of your wish
- 2-you will be able to see every user and the name of the room at your left
- 3- Enter a message saying hi and leave the room

Time taken: 56s

Which of the following would best describe the difficulty of this task? (Check one box)				
Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well
I was able to communicate, see the list of available users in room 3, furthermore the app noticed me when joseph left the room
What you felt could be improved
Add maybe a location to it, to see the user location
Other things worth mentioning

Scenario 14:

User Story: As a customer, I want to return to the main app

Instructions: at your top left there is a link stating return to the main site, it will redirect you at localhost 3000

Time taken: 3s

Which of the following would best describe the difficulty of this task? (Check one box)

Very Easy	Moderately Easy	Neutral	Moderately Hard	Very Hard
x				

What you felt went well

Easy to access

What you felt could be improved

Other things worth mentioning

Appendix4: THIRD PARTY USED

In this section I will outline some license I have been using to develop my project

Node

- 1-Cors - <https://expressjs.com/en/resources/middleware/cors.html>
- 2-Express - <https://expressjs.com>
- 3-Mongoose - <https://mongoosejs.com/>
- 4-Mocha - <https://mochajs.org/>
- 5Chai - <https://www.chaijs.com>

Ci/cd pipeline

- 1-Travis – <https://travis-ci.org>

Html/CSS/EJS

- 1-HTML- <https://html.com>
- 2-CSS- <https://css-tricks.com>
- 3-EJS- <https://ejs.co>