Coffee Cars and QR codes

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Abstract

The idea behind this project is to develop a Front and Back-end application that will allow users to connect with a Car community which is difficult to connect with through regular social media applications.

The aim of the project is to construct a React based mobile first web application that a user could select a venue where car meets take place on a regular basis. The application will contain information of upcoming meets from different Coffee& Car groups throughout the country. The user can select an event in which the wish to attend and see who else from the community is going to attend. A user can decide to like a post or an image that a user has posted to the community.

The purpose of the application is to allow users to get an insight of the car community and become an active member although they may not have a vehicle that has the street cred of vehicles that are usually shown when an activity takes place. The location of the venue will have a latitude and longitude reference and a possible google map location reference.

The application started as an inquiry to a Coffee & Car meet held in Bray. This meet is held the first Sunday of every month in the IDA business park just off the southern crossroad, Bray. It became aware to me after attending this meet that some of the participants would show off their vehicles at other locations throughout the month in different parts of the country. At first it looked like an underground thing where there are no members of any organisation, only people with a shared interest in car culture and showing off their vehicle to a willing audience. Then it was apparent that these people would post on forums, location of meets and times, locations and invite members of the forum. The question is how you gain access to the forum or even find out about it. My idea is to develop an application that is connected to a QR Code. The public that may have an interest can scan a select QR Code and be guided through it to gain access to this world of Cars/Coffee and new friendships. Car at the meet may have a sticker with said QR Code that can be scanned to allow the public to join the community. The restaurant that is in the location can have a flyer on a notice board telling customers of upcoming events and the notice board may display a QR Code that tell customers when such car events take place.

The application started out as a paper prototype and was refined in cardboard before it was developed in a hi-fidelity prototype in Figma. The premiss is that a user would scan a QR Code and be brought to the mobile application when they can view upcoming events in the Coffee and Car community throughout the country. The application will also show other users of the application and the vehicles they own and show at car meets. Users can comment and like a post from other users in the community. A Database Dictionary was developed from an ERD to work out the relationship between aspects of the working application. This was then refined with the aid of my supervisors.

Acknowledgements

I would like to thank my wife and family for all their support over the last four years in getting me to this stage of the creative computing hons degree course, it hasn't been an easy road for me but it definitionally has not being an easy road for them. Secondly, I would like to thank my supervisor Joachim Pietism for his support and guidance throughout this process. During the working on this project, I came across many hurdles which alone I was not able to clear, I sincerely want to thank the level of support I received from the lectures at IADT especially my second reader Mohammed but also John Dempsey who brought me back from the brink of giving up, Thank you John, I will never be able to understand the length you went to get me back on track. Lastly, I would like to thank all the lecturer staff whom I have studied under over the last four years in IADT there guidance and support have gotten me to the place I am now.

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Contents

1. Introduction

The overall aim of this project is to develop a web application using the MERN stack. The mobile and web application will try and connect the Coffee and Car community to offline persons outside their community. The application will be built using React and deployed using Reacts development. The backend will be stored in a MongoDB database and hosted using Vercel. The application will be built using Visual Studio Code editor, written in React. The images will be accessed from an AWS s3 Bucket.

Technologies:

- MongoDB
- React
- Express
- AWS s3 Bucket

Tools:

- Word
- Figma
- GitHub
- Visual Studio Code
- Journal (Hand-written)

Requirements

- Develop an interaction application for the general to connect with the Coffee and cars community.
- QR Code development and implementation.

Design

- Mobile first application.
- Figma Prototype

Implementation

- React
- AWS Bucket
- MongoDb database

Testing

- Jest
- Supertest
- Insomnia
- Chrome inspector

2 Requirements

2.1 Introduction

The Coffee Cars QR codes application should allow users to view upcoming Car events from a calendar of events. When the event is selected the user should be able to tag it and comment if they will attend or not. Find the location of an upcoming event with a possible google map reference to its location. A user can register for further uses of the application. A registered user can set up a profile. Create a placeholder for vehicle information that they own and images to boot. A flyer could be printed and posted in the coffee shop where the meet takes place. People who use the coffee shop could scan the QR Code from a leaflet and get details of upcoming Coffee and Car events.

2.2 Requirements gathering

2.2.1 Similar applications

A quick Google search for coffee and card brings a lot of Facebook and Instagram responses. There is a website called https://www.carthrottle.com and one from the RIAC, the Royal Irish Automobile Club https://www.riac.ie ----- Firstly, we will look at the two web application before we examine the social media power houses of Facebook and Instagram.
After accepting a privacy notice in CarThrottle we are brought to a home page where the main screen is a YouTube link to a car meet that was held six years ago.

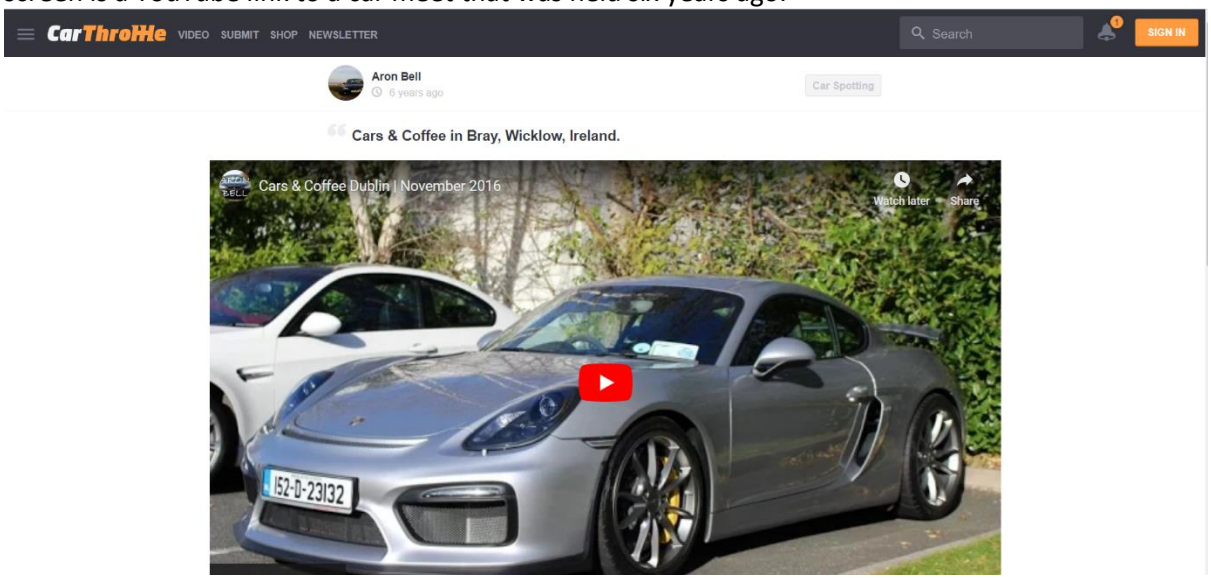


Figure 1. CarThrottle cover page.

The website CarThrottle has a wonderful image of a Porsche 911gt from 2015. This image is a link to a You Tube video. The top left of the webpage has a burger menu which has a nice dropdown showing links to other parts of the web application.

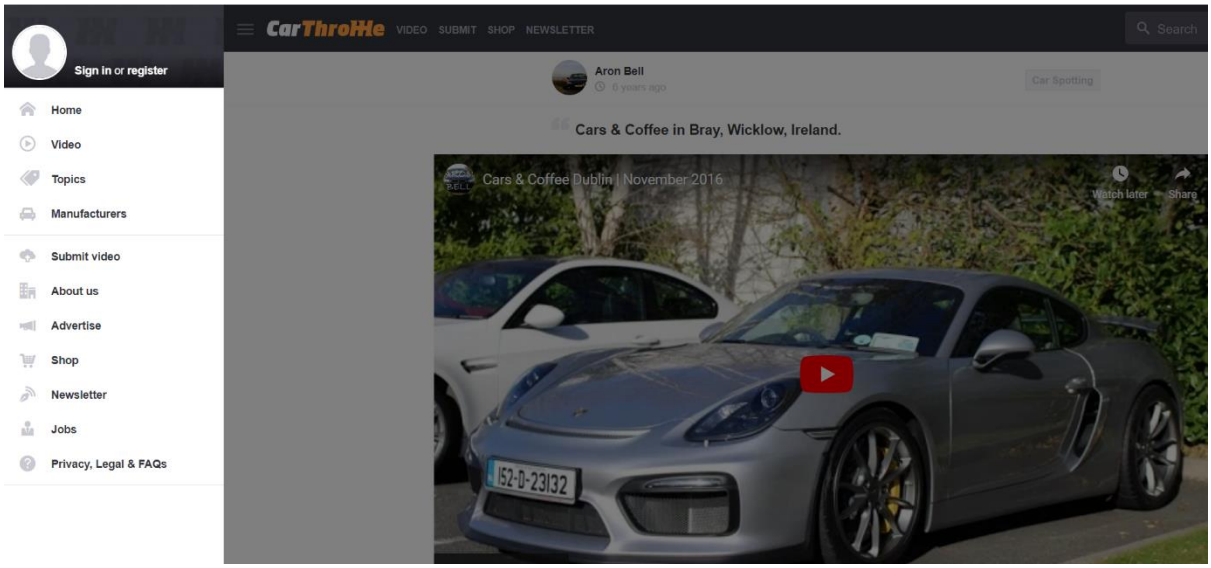


Figure 2. CarThrottle Burger menu drop down.

The dropdown looks very pleasant, but the user must choose an option to proceed with viewing the web page. Although the web page was found using a Google search named “Coffee and Cars” when you select the home menu icon from the Burger dropdown menu it brings you too an up to date web application.

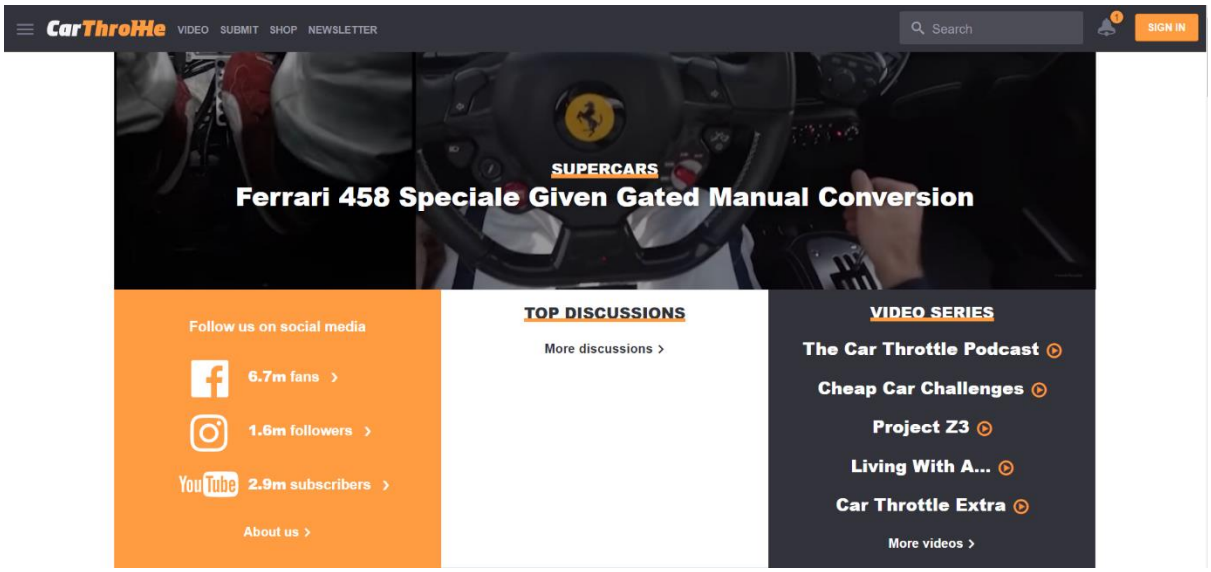


Figure 3. Car Throttle after selecting Home from Burger menu.

From the new homepage you can see that CarThrottle have Facebook and Instagram pages with a healthy YouTube subscriber base. This goes to show that the two power houses are not trusted to cover user involvement with their community.

Heuristic Evaluation of www.carthrottle.com	Comment (+ Example if present)

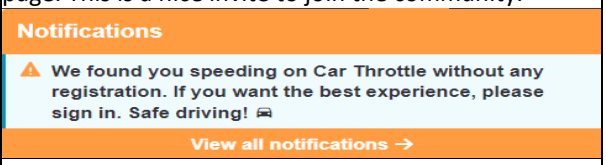
Aesthetic and minimalist design	The visual aspect from the google result of coffee and cars is a clean and crisp web application. In the main part of the web page there is a button called “Car Spotting” where it invites users to engage with images of cars that are seen in other places then car meets.
The Bell Icon	The bell icon gives a notification when you revisit a page. This is a nice invite to join the community. 
Burger Menu Dropdown	The dropdown menu has several avenues to go down. The use of Icons make it clear to users to what they entail.
Consistency and standards	Consistent icons used throughout the site to represent points of interest. A simple colour palette that only has one colour with black and white.
Above the fold	The majority of the web-based pages use the above the fold philosophy of keeping it clean and invites the user to explore lower.
Minimal Navbar packed to the brim.	The Navbar looks minimal but holds many features such as burger menu, Notification, search bar, sign in, to name but a few.
Video page	This page includes list of videos using a card system that is clean and crisp. The repetition of cards and layout is very pleasing and easy to navigate.
Sign In	Sign in gives the option to sign in through Facebook
Job	It is obvious that there is good funding to this web application as production value to its content.
Overall	The overall aspect of the CarThrottel web application is of a well-planned, executed and delivered app. Users are encouraged to get into the community.

Figure 4. Heuristic Evaluation of CarThrottle

The other website that comes from a google search is http://www.riac.ie/news/riac-cars-and-coffee-2022. This front page looks very busy with an image of an old Alfa Romero with some text across the centre which works out to be navbar. Below the fold the webpage has some text and an image of some vintage cars in a shed. Below this a form to leave a reply to a comment that does not exist.

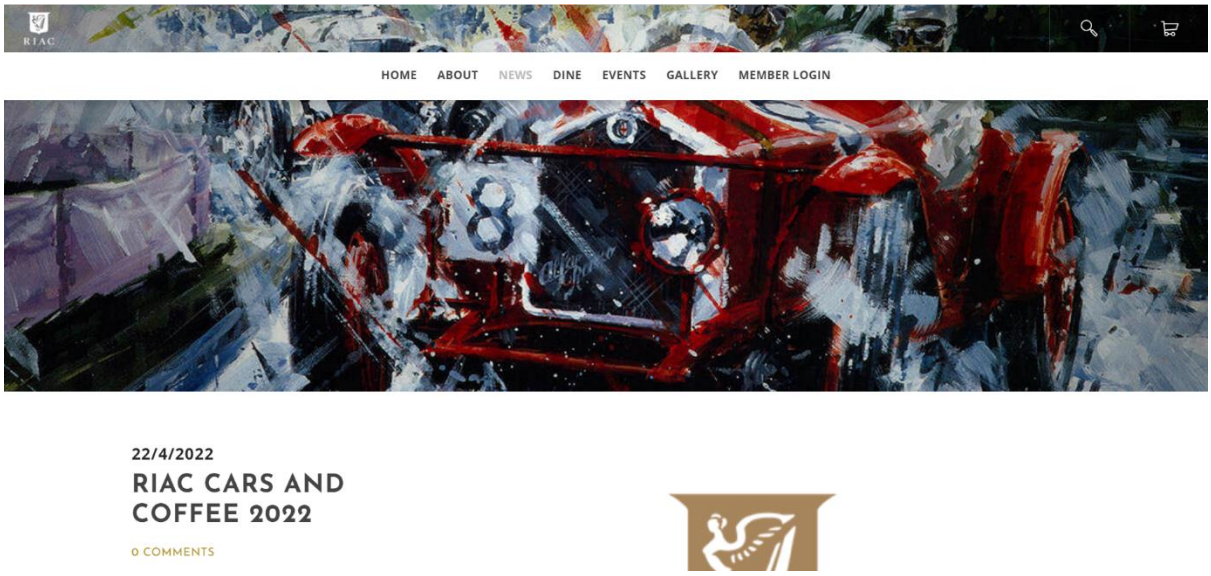


Figure 5. RIAC Coffee Cars Google response

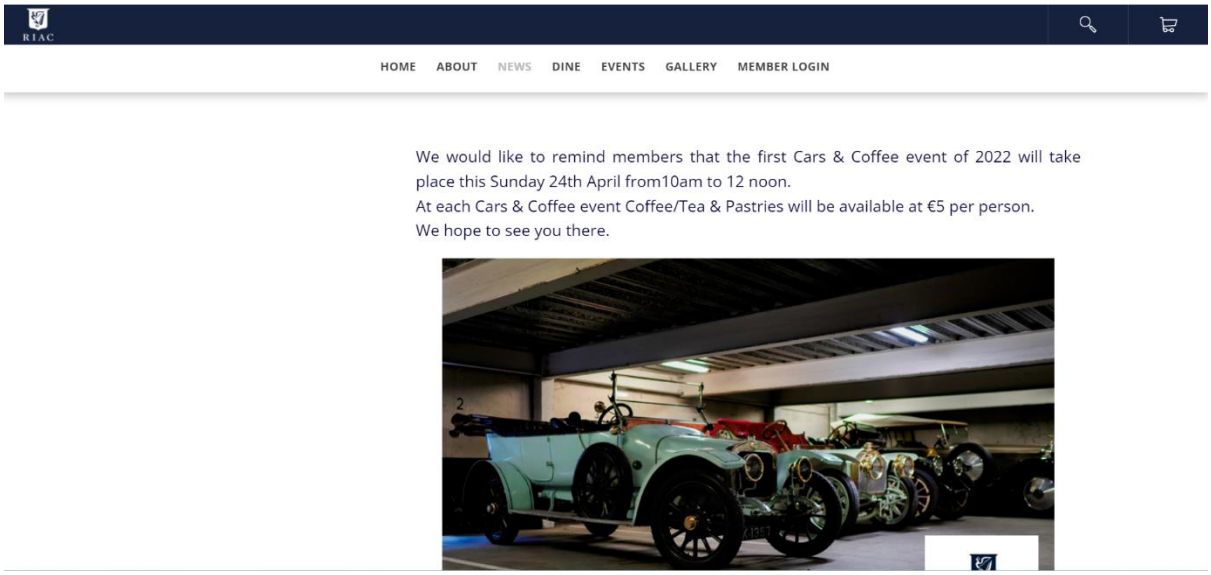


Figure 6. RIAC Below the Fold

I'm not sure of the RIAC website of a coffee and cars is a good example. Firstly, it only has a date from 2022 which has passed. The comment section has no comment in which to reply

Heuristic Evaluation of www.riac.coffee-cars-	Comment (+ Example if present)
Aesthetic and minimalist design	The visual aspect from RIAC coffee cars is lazy. A fantastic image of a vintage car but very little else.
The Search Icon	The search icon turns the Navbar into a blank strip of white with a search icon and the text search. No blinking text indicator.
Below the fold	Below the fold the webpage gives some text and an image, very clean but does not inspire the user to proceed into the website
Consistency and standards	Little use of icons used throughout the site. A simple colour palette that only has one colour with black and white. The images used are busy and distract the eye.

Navbar packed to the brim.	The Navbar has a lot of text components in it, although they are well laid out, they are not inviting.
Overall	The overall aspect of the RIAC web application is a webpage with little information and not inviting.

Figure 7. RAIC coffee cars web presentation.

2.2.2 Interviews

The first interview was held with a father of two in the coffee shop where the cars event was taken place, the interviewee was unaware that the event take place monthly at this venue. They believed that it was a once a year thing that you may see down at the seafront during the summer season. They enjoyed seeing the vehicles and did not really have any interaction with any of the participants. They were interested with the idea of seeing an application that would connect them with this community. They got a feeling that the people at the event knew each other very well and although people were encouraged to look at the vehicles there was a bridge to be crossed to get a better understanding of what they were about. If there was an application to be developed it would be nice to have details of upcoming events.

Similarly, the second interview was held with a young woman who turned up in her Mazda MX5, this was the first time she was showing off her car to the general public. She had spent all the last night cleaning it and was a little disappointed that the weather hadn't held up as it was forecast but she was happy to be there. Again, she understood the difficulty of connecting with this community as they sometimes get harassed from the Gardai, and at previous meeting, at a different location the industrial estate managers block access to vehicles over the weekend. Back then she would go a view the vehicles, but it took her courage to attend as an exhibitor. She knew of other events from around the country but as to when they would take place could be hit and miss. This interviewee would like an application to connect with other exhibitors.

The third interview, was given by small group of exhibitors who had turned up in Nissan Z series cars. These looked like a well-knit group. They like to exhibit their cars together at events. They are part of a WhatsApp group that would travel around the country. They understood the secrecy the organisers of the event undertook as there have being some who would turn up and cause havoc by doing burnouts and rallying in the settings of the industrial estates. They usually keep them selves to themselves and understood the difficulty of the public to keep up with these car events. They explained that sometimes they would leave on event and head to another in the afternoon in another location. They did admit they did not know of all the events that would take place throughout the country and would be interested in finding out about other events.

2.2.3 Survey

A survey was created to ask respondents about some thing they feel are important for the Coffee & Cars application. Those surveyed were 58% male and 42% female.

There were three different types of participants, motor enthusiastic without vehicle to show, general bystander and motor enthusiasts with vehicle to present to the public.

5. Do you attend many Coffee & Cars events?

6. How did you find out about this event?

7. How would you like to get more information about upcoming events?

2.3 Requirements modelling

2.3.1 Personas

These are fictional characters to help the developer understand the users' needs. They also help identify who the relevant users are.

2.3.2 Functional requirements

Some of the functional requirements for the web application are registering a user/admin, then login capabilities. The application will have users predetermined as non-admins while select others will have admin prevails through the Mongo DB database. Regular registered users will have the ability to login and view some upcoming events.

#	Functional Requirement	Priority
1	As a user, I want to be able to sign up and log in to the application.	High
2	As an administrator, I want to be able to add new data to the database through the application.	High
3	As a user I would like to be given the location of a car meet.	High
4	As a user I would like to know the starting time of an event.	
5	As a user I would like to view single user.	High
6	As a user, being able to make a positive comment on an image.	High
7	As a user I would like to view images of vehicles.	Medium
8	As a user/admin, I want to remove non positive comments from users.	Medium
9	As a user, I want to see upcoming events.	Medium
10	As a user, I would like to see some information before signing up.	Medium
11	As a user, being able to see the location of the venue.	Medium
12	As a user, to knowing when the activity ends.	Low
13		Low

2.3.3 Non-functional requirements

These are requirements which if not met do not stop the application from working, but which mean that the application is not working as well as it should. They are usually based on issues such as:

- Usability
- Performance
- Security

2.3.4 Use Case Diagrams

Consists of actors and use cases. You should document each individual use case.

2.4 Feasibility

The following are the technologies going to be used to develop and run this application.

- React – Frontend development platform.
- Express.js – Backend node configuration.
- MongoDb – database model storage.
- AWS – S3 Bucket to store images.
- Visual Studio Code VSC – Code editor from Microsoft.
- Google Chrome – web browser
- Insomnia – Testing connections in the backend.
- Heroku – Backend server hosting.
- Firebase – Google's online free web hosting service.
- GitHub – A git repository for hosting code.

React is a front-end open-source JavaScript library framework to build user interfaces. It will let you fetch data in asynchronous components that run on a server.
Express.js is a flexible Node.js web application framework that provides sets of features for mobile and web applications.
MongoDB is a developer data platform built on the leading modern database.
AWS is Amazons secure, reliable scalable service with In-Memory Caching.
VSC is a code editor from Microsoft to edit, refine and optimized for building and debugging modern web applications.
Google Chrome is a free web browser with a very good inspector model that can have a plug-in react extension.
Insomnia by Kong is a collaborative open-source API development platform.
Heroku (PaaS) platform as a service that enables developers to build, run and operate application in the cloud.
Firebase is Googles mobile platform that helps you develop high-quality application and host them to the net.
GitHub contribute to the open-source community by storing and managing repositories.

2.5 Conclusion

Write a couple of paragraphs summing up the chapter. Explain what area your project is about. Describe what the chapter has discussed.

This chapter has looked at similar applications and has asked persons that have attended a car event what they would like from an application.
The main response was

- Upcoming events date and location
- What users were going to show

The application will be written in react and hosted on the web.

3 Design

3.1 Introduction

The design of the Coffee Cars and QR Codes is a mobile first web application that is built using the MERN stack. The application is designed to be user friendly and easy to navigate. The external part of this project is the design of flyers that contain QR Codes to connect offline users interested in Cars and Car restoration/modification. The mobile app will have a QR Codes scanner available to it for users of the application to scan induvial vehicles to get detailed information on the built of the vehicle.

3.2 Program Design

3.2.1 Technologies

The process started with pen and paper. The first idea came from folding a sheet of paper three times. This gives a sheet of eight equal rectangles, very similar to a mobile phone screen. A rough sketch of a phone screen is drawn and what is going to being displayed on then. A basic layout of the mobile application's home screen, login details, main viewpoint is sketched on the paper.

----------Insert figure here of paper prototype----------

After that process we moved onto a Lo-fidelity prototype, which involved having a A4 notepad and folding the pages in half portrait style and drawing the outline of a mobile phone on each face. The prototype is drawn onto the first page and then the process a user may take when they press an imaginary button or screen swipe. This starts to iron out any faults in the application before a Hi-fidelity prototype is developed.

----------Insert lo-fidelity prototype figure here----------

Next I got some cardboard and cut out some mobile phone shapes and added a top layer so I could slide better drawn images of the application onto cards and slide them into the screen. This was used to show test cases where the application would bring them when they would interact with the application.

----------Insert figure of Hi-fidelity prototype----------

The next design stage is to refine the application with the use of Figma. Figma is a collaborative web application for design. It is used to design web and mobile applications. Figma can be shared between team members, where each member can critique, comment and design parts of the design. John Montayne ran a workshop showing us some of the fundamentals of Figma. While in the workshop, John explained the importance of making components and getting the smaller details correct, as this will make our workflow better. At this stage I looked at a colour scheme and decided on the following ones.

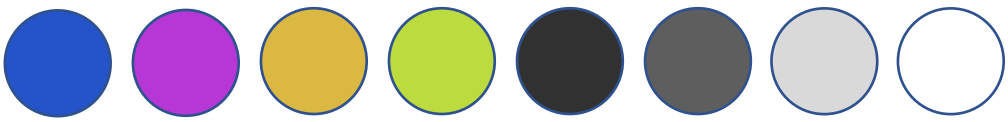


Figure 8. Colour schemes mark 1.

In discussion with my supervisor, it was decided that there were too many Primary colours in the colour scheme, so I fixed on the following scheme. This may be altered in the future and will be added to this section and will be noted as such.

Figure 9. Colour scheme after discussion with supervisor.

The other main item that was selected at this time was the typeface. The type of font that was selected is Roboto. For the Headings in the application Roboto Mono with a weight of 400 and a size of 40px and a line height of 52px. The secondary type of font to compliment the heading font was Roboto Slab with a similar weight and a size of 32px with a line height of 42.2px. Although this is what is decided on the size and weight can be adjusted to suit the area it is being placed in. The font used in the mobile application would be similar but a smaller size and line height.

Heading Text,

Secondary Text,

Figure 10. Text family used in mobile and web application.

Figure 11. Screen shot of Figma design.

I also started to use GitHub as a repository at this time. GitHub is mainly used for software developers to stage their code. It is a great way to develop an application as each time a commit is pushed to the tree a new version of the application is created. A developer can visit older stages of code through GitHub's technology. For me I wanted to show the development stages of Figma. Instead of filing a final version, with GitHub I could save various stages of the design process and share these with my supervisor.

Figure 12 GitHub Link https://github.com/IADT-projects/y4-project-Derek-n00192978

When my supervisor was pleased with the development of my design then and only then do I start to code. For this I will be using Visual Studio Code. Visual Studio Code is a source-code editor developed and owned by Microsoft. It is a wonderful application for writing, editing, debugging, and refining mobile and desktop applications. It supports many languages, such as HTML, VUE, React, Angular, C#, Java, and JavaScript to mention just a few.

3.2.2 Structure of React

React is a Front-End developing application. The structure of React is made up from various folders, these folders are as follows.

- Assets Folder
- Layouts Folder
- Components Folder
- Pages Folder
- Middleware Folder
- Routes Folder
- Config Folder
- Services Folder
- Utils Folder

The Assets folder contains items such as personal CSS guides. I know the Components folder contains parts of the application that can be used over again. Things like a Navbar, Footer, cards and forms are built into the components folder and used with the Pages folder. The Pages folder contains code to power the likes of the home page and in the case of this application a Vehicle folder within the pages folder, a login page, register page. The Utils folder stores information that helps the react application connect to external features such as databases or AWS services.

In the CoffeeCarsQrCodesFrontEnd application the following installations were invoked.

- npx create-react-app coffeecarsqrcodefrted
- npx start
- npm install react-router-dom axios
- npm install multer
- npm install @mui/material
- npm install @mui/icons-material
- npm install @mui/material @emotion/react @emotion/styled
- npm install @fontsource/roboto
- npm install react-bootstrap bootstrap

These add in gives the react application a strong foundation to build a pleasing mobile/web application

3.2.3 Design Patterns

3.2.4 Business rules

- An Event has a Latitude/Longitude.
- Admin can create an Event.
- A user can attend an Event.
- A user can have a Vehicle.
- A user can follow another User. / follower.
- A user can have a follower. / followee.
- A user can have a profile image.
- A vehicle can have many images.
- A vehicle can be liked.
- An Event can be commented on.
- A user can make a comment on a vehicle.
- A user can like a comment from another user.
- A vehicle can have a type.

3.2.5 Database design

Table Name	Attribute	Contents	Type	Format	Range	Required	PK or FK	FK
user	id	user id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	email	email	VARCHAR (25)	Xxxx xxx	Max 25 Char			
	password	password	VARCHAR (25)	Xxxx xxx	Max 25 Char			
	fName	John	VARCHAR (25)	Xxxx xxx	Max Char 25			
	admin	Yes/no	Boolean					
	profile_image	Profile_image	VARCHAR (225)	Xxxx xxx	Mac Char 225			
event	id	Event id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	Date/time	date/time	Date/Time	12/02/2023				

	latitude	Latitude number	VARCHAR (50)	Xxxx Xxx	Max 50 Char			
	longitude	Longitude number	VARCHAR (50)	Xxxx xxx	Max 50 Char			
	user_id	user_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	user_id
	description	Description of event	VARCHAR (225)	Xxxx xxx	Max 225 Char			
	title	title of event	VARCHAR (50)	Xxxx xxx	Max 50 Char			
	event_image	image details	VARCHAR (50)	Xxxx xxx	Max 50 Char			
vehicle	id	vehicle id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	make	Ford	VARCHAR (50)	xxxxx	Max 50 Char			
	model	ranger	VARCHAR (25)	Xxxx xxx	MAX 25 Char	Y		

	year	2014	VARCHAR (10)	xxxxx	Max 10 Char			
	fuel	electric	VARCHAR (25)	Xxxx xxx	MAX 25 Char			
	description	Description of vehicle	VARCHAR (225)	Xxxx xxx	Max 225 Char			
	forSale	Yes/no	Boolean	Xxxx xxx				
	user_id	User id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	user id
	type_id	type_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	type id
follower	id	follower id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	follower_id	user id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	follower id
	followee_id	user_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	followee id

event_calendar	id	event-calendar id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	text	Event calendar_details	VARCHAR (225)	Xxxx xxx	MAX CHAR 255			
	Date/time	Date/time of event	Date/time	23/02/23				
	user_id	user_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	user id
	event_id	event_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	event id
comment_like	id	comment_like_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	user_id	user_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	user id
	comment_id	comment_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	comment id

Vehicle_like	id	image_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	user_id	user_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	User id
	vehicle_id	vehicle_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	vehicle id
event_com ment_like	event_comment_like_id	event_comment_lik e_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	user_id	user_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	user id
	comment_id	comment_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	comment id
comment	id	comment_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	text	Event calendar_details	VARCHAR (225)	Xxxx xxx	MAX CHAR 255			

	Date/time	Date/time of event	Date/time	23/02/23				
	user_id	user_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	user id
	vehicle_id	vehicle_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	vehicle id
type	_id	type_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	name	Tractor	VARCHAR (50)	Xxxx	Max 50 Char			
image	_id	image_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	PK	
	name	Tractor	VARCHAR (50)	Xxxx	Max 50 Char			
	vehicle_id	vehicle_id number	BIGINT[UNSIGED]	101	0-18446744 0737095	Y	FK	vehicle id

Figure 13. Database dictionary

3.3.1 User Flow Diagram

ERD Version 2 08/02/2023

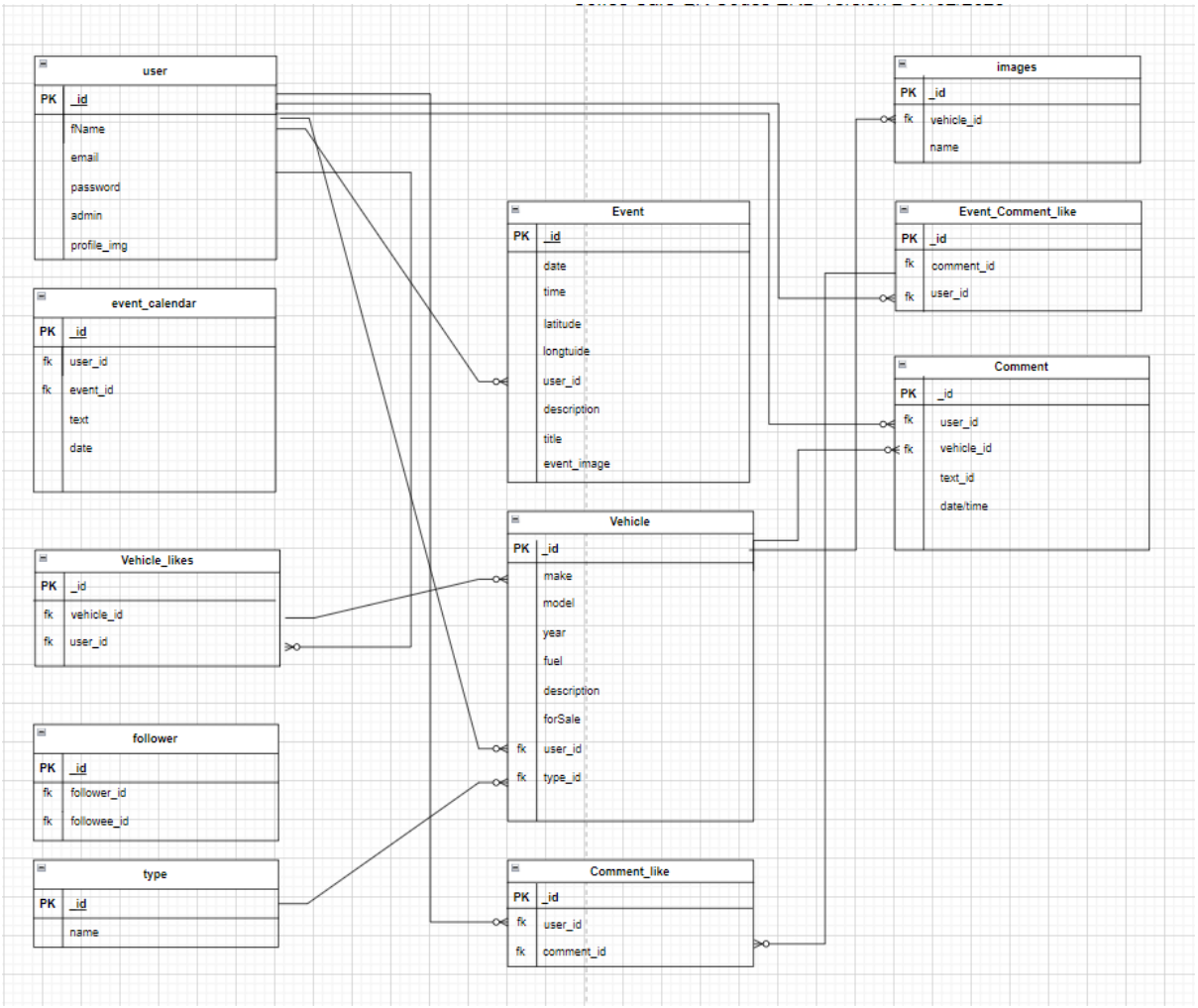


Figure 14. ERD Version 2 08/02/2023

3.4 Conclusion

The work undertaken is this section is the foundation to the work for the backend application framework. Having ironed out all issues with the supervisors has helped make the next process work a lot easier. Getting the Prototype image in Figma helps to visualize what the application can do but also an understanding of what is required to be developed in the background to support the frontend application. Talking with Mohammed made the second version of the ERD more simplified that the original ERD developed by myself.

Implementation

4.1 Introduction

- React is a free open-source front-end JavaScript library. It is maintained by Meta and a community of individuals. It builds on top of HTML, CSS and JavaScript with intuitive API and world-class documentation. React is truly reactive optimized rendering system.
- Express.js is a back-end web application for building RESTful APIs with Node.js. It is free and open-source software
- MongoDB is a developer data platform that provides services to build distributed application fast. MongoDB makes it easy to deploy and manage databases on-demand.

4.2 Scrum Methodology

4.2 Development environment

- GitHub
  Using GitHub is a wonderful experience. Firstly, go to GitHub and set up a repository with a sensible name. Then select the file on your machine where your environment is going to be stored. Right click on this folder and gitbash. The run the command “npm init” this will then initialize the folder to be ready for Git repo to be linked. The next command to be run is “git branch -M main” this sets up a branch to the repository. Then a link is created between the folder on the system directly to GitHub, this command is “git remote add origin https://github.com/<Account-Name>/<repo -name>”. After this the folder on your machine and the GitHub repo are connected. Before you go any further you should back up the basic folder to git. This is done by running the code “git push -u origin main”, now both folders are at the same point and progress can be made with the work on your machine. After every day or even when an important work is completed and known to be working a backup should be completed. This is done using the following codes -> Firstly “git status” this shows the difference between the file on the local machine and the git repo. Next is “git add.” this tells git to add the changes globally. Up next is “git commit -m “Message related to changes made to code” this commit with the message lets the user know what changes have been made to the repo and can be a handy return point to working code. The next command is “git log –oneline” this gives the commit a reference name to what changes have been made to the repo. The last thing is to push the changes to the repo, this is achieved by running the command “git push”. This then pushes the changes on the local system to the git repo.
- React
  React is a free open-source front-end JavaScript library. It is maintained by Meta and a community of individuals. It builds on top of HTML, CSS and JavaScript with intuitive API and world-class documentation. React is truly reactive optimized rendering system.
- Insomnia (DR)
  Insomnia is a free cross-platform desktop application that takes the pain out of interacting with and designing HTTP-based APIs. Insomnia combines an easy-to-use interface with advanced functionality like authentication helpers, code generation, and environment variables. (Kong, 2022)
- MongoDB (DR)
  Get your ideas to market faster with an application data platform built on leading modern database. Support transactional, search, analytics, and mobile use cases while using a common query interface and the data model developers love. (Mongodb, 2022).

- Express (DR)
  Express is a minimal and flexible Node.js web application framework that provides a robust set of features for web and mobile applications. (Express.js, 2022).
- Google API (DR)
  Google Cloud Platform lets you build, deploy, and scale applications, websites, and services on the same infrastructure as Google. (Google, 2022)**.**
- Firebase (DR)
  Firebase helps you build and run successful apps. Backed by Google, loved by developers. Accelerate app development with fully managed backend infrastructure. Learn more today. Cross-Platform Solutions. 15+ Products & Solutions. Monitor App Performance. (Firebase, 2022).

4.3 Sprint 2

[redacted]

Major Project – DL836 BSc in Creative Computing

Record of Sprint Review meeting between student and supervisor

Student	Derek Reid N000192978	**Supervisor**	Joachim Pietsch
Sprint #2	Design sprint 1	Date	17/01/2023 – 24/01/2023

Items discussed at this meeting:

In this sprint we began to look at the design elements of the mobile application
Sue held a workshop on starting a design to work towards, In it she discussed the working of crazy 8, where you fold a sheet of paper into 8 squares and design a screen on each section of the page.
We also talked about the flow of a mobile application and what to look for in a good working application.
John Montayne held a Figma workshop and gave us an example of making Components.
Grainne Carroll uploaded a number of video tutorials on Teams for us to follow about Figma.
In our weekly meeting Joachim looked at the progress of the mobile design and gave some insights to making it mare streamline and user friendly.

Activities and/or Backlog items complete:

In this Sprint I have worked on the design elements and with Figma have worked on a basic layout and refined the color scheme.
Worked on a paper prototype and flash cards to detail how the application flows from one screen to another. This will be an ongoing item.

Activities and/or Backlog items to complete prior to next review:

I must investigate how the likes of WhatsApp use a QR code scanner to work from within the application.
Refine the footer to remove the profile tab and possible have a calendar instead.
Investigate the register/login methods and the access to a camera/location in an application.

I, the student, confirm that the above is an accurate record of the meeting.

Signature of student: Derek Reid 24/01/2023

I, the supervisor, confirm that the above is an accurate record of the meeting.

Signature of supervisor: _____

4.5 Sprint 3

[redacted]

Major Project – DL836 BSc in Creative Computing

Record of Sprint Review meeting between student and supervisor

Student	Derek Reid N000192978	**Supervisor**	Joachim Pietsch
Sprint #3	Implementation 1	Date	31/01/2023 – 16/02/2023

Items discussed at this meeting:

In this sprint the application was looked at in depth, from developing a prototype in Figma that ran through the process of clicking on a mobile screen to simulate a walk through event.
Developing a ERD and Database dictionary so work can commence on the backend application.
looking a Design patterns for react to learn what a design pattern is. Learning about conpoments.

Activities and/or Backlog items complete:

In this sprint I have completed a Figma mobile, and Web based application design with a walk through for this prototype.
The Express backend has begun now that I have complete the ERD and Database Dictionary.
A MongoDB has been setup and is ready to connect to an insomnia program.

Activities and/or Backlog items to complete prior to next review:

The design pattern to be complete.
Develop the first implementation of the working prototype of the backend.
Look at a LinkedIn learning course advised by my supervisor to help with the design pattern.

I, the student, confirm that the above is an accurate record of the meeting.

Signature of student: Derek Reid 28/02/2023

I, the supervisor, confirm that the above is an accurate record of the meeting.

Signature of supervisor: _____

4.6 Sprint 4

Major Project – DL836 BSc in Creative Computing

Record of Sprint Review meeting between student and supervisor

Student	Derek Reid N000192978	**Supervisor**	Joachim Pietsch
Sprint #4	Design 2	Date	28/02/2023 – 13/03/2023

Items discussed at this meeting:
To start building a backend framework that will connect with the Mongo database using Express. To get the basics of a register/login backend operational. To start building a basic frontend application in React that a user can register/login to the application. Work on the written document and complete the design section.

Activities and/or Backlog items complete:
A mongodb database was setup but using what was thought to use I could not connect to it, but I am connected to a database that accepts a user registering and logging through Insomnia. This Item must be discussed with Mohammed. I am going to reuse an AWS bucket that was set up for a previous project as they are being used in a similar way. A Figma prototype showing a virtual run-through of the mobile application was completed. A look a similar application were appraised to compare what this project should complete.

Activities and/or Backlog items to complete prior to next review:
Extend the Design pattern for the application. Extend the backend to include vehicles and other requirements from the ERD. Develop the front-end to include more features.

I, the student, confirm that the above is an accurate record of the meeting.

Signature of student: Derek Reid 17/02/2023

I, the supervisor, confirm that the above is an accurate record of the meeting.

Signature of supervisor: _____

4.7 Sprint 5

[redacted]

Major Project – DL836 BSc in Creative Computing

Record of Sprint Review meeting between student and supervisor

Student	Derek Reid N000192978	**Supervisor**	Joachim Pietsch
Sprint #5	Implementation Document v3	Date	28/02/2023 – 17/03/2023

Items discussed at this meeting:
After the presentation to Joachim and Mohammed it was suggested to me to develop a Dashboard to display users bio and their liked vehicles and events.

Activities and/or Backlog items complete:
A complete removal of any Bootstrap frame work and build the application totally in material mui components. Doing this has broken the link with the AWS server, where the images are stored and fed to the web application. Work n get the application to display a welcome message to the logged in user. Unfortunately, I cannot get a single users id to display but I can get all users to be displayed.

Activities and/or Backlog items to complete prior to next review:
Get the dashboard to display users details from the user's details.
Fix the problem with the images coming from AWS to the application.
Talk with Catherine Noonan in regards to writing the thesis up.

I, the student, confirm that the above is an accurate record of the meeting.

Signature of student: Derek Reid 17/03/2023

I, the supervisor, confirm that the above is an accurate record of the meeting.

Signature of supervisor: _____

4.12 Conclusion

The weekly meetings with the supervisor were very helpful when the project started as the deadline seemed so far away, but have mini deadlines helped keep the project going and stay on the rails.

Working on such a big project independently can seem like a hugh undertaking but taking it step by step and working with the supervisor helped keep focus.

Looking back at all the sprints and what was required for each one helped the process of breaking the application into bite size chunks.

5 Testing

5.1 Introduction

This application has mainly been tested with Insomnia. Insomnia is an open-source desktop application that takes the pain out of interacting with and designing, debugging, and testing APIs. Insomnia combines an easy-to-use interface with advanced functionality like authentication helpers, code generation, and environment variables (Kong, 2023). This was to test the responses from calls to the database and see the results. It is also good for testing connections to the database and make sure the calls to the database are correct.

5.2 Functional Testing

5.2.1 CRUD

The CRUD (Create, Read, Update and Delete) functions are set up in the backend of the application. These functions were tested with Insomnia before the front end was developed.

5.2.2 Discussion of Functional Testing

There are two types of testing when building an application, Testing lead development or Development lead testing.

Testing lead development is where a testing software program like Jest is installed into the backend at the start of writing the application. Test are written in the terminal and are run, these tests will fail when first run then the code is written to resolve the errors and then the next test is written and run, failed and the code is written to resolve the error and it continues along the same line. This is known as test lead development.

Development lead testing is where the code for the application is written in full or there abouts and then tests are run in the background to make sure the responses coming to application are correct. Insomnia is a very good application to run these tests.

5.3 User Testing

Users were shown the application and were asked firstly to register to the application. While been watched how they navigated to the register tab of the nav bar. All users found this location easily. The next task asked of the Users was to login. The login prompt came easily to the users. Some Users noticed the Make of the Vehicles card been underlined and asked why that had changed? The next item on the User testing was to View a single Vehicle, Some of the participants rolled over the Make of the vehicle and clicked on it straight away others rolled onto the card but didn't realise that they had to click to get to a single page. After Viewing a single Vehicle, users were asked to add a vehicle to the application, with this they were given dummy text and image to allow them go through the process without having to think of coming up with information to fill out the form. The Users were observed rolling the mouse over the application and quickly realising that the Vehicle tab in the Navbar gave an option to create/edit vehicle. When the users clicked the tab of the navbar they liken the form like the one they had filled in for the register. Some like this as it gave the application a aspect of flow.

5.4 Conclusion

The testing of the application is critical to ensure the smooth running of the final application output and working out any bugs that may slow the application down.

The backend of this application was run many times in Insomnia to ensure the responses that were received were the ones expected.

The application was loaded into chrome web browser through a local host, and the inspector with it's built in React extension the inspect element of chrome helped iron out the bugs in the frontend of the application

6 Project Management

6.1 Introduction

This chapter describes how the project was managed and how well the project ran. It shows the phases of the project, going from the project idea through the requirements gathering, the specification for the project, the design, implementation, and testing phases for the project. It also discusses Figma, GitHub and project's journals as tools which assist in project management.

6.2 Project Management Tools

6.2.1 Figma

Description

Include Diagrams

How it worked

6.2.2 GitHub

Projects on GitHub.com can be accessed and managed using the standard Git command-line interface in the terminal of the visual studio code editor. All standard Git commands work with it. GitHub.com also allows users to browse public repositories on the site. After adding a repository in Github the link can be added to any folder on a local network by suing the following commands.

Here are the commands for using Git-

- Git init
- Git status
- Git add .
- Git commit -m "Guiding quote here"
- Git log –oneline
- Git push

How it is used, Github is used to track changes to in this case to an application front or Backend. Before the code editor is running the folder where the application is being built an initial commit is pushed to github. This sets out the repository and from there the track all changes to the application. After writing and testing written code it can then be pushed to

GitHub and commented correctly. If the application breaks with a change of code the repository can be called upon and the proper last working version of the application can be pulled from the github repository.

How it worked in practice, In practice GitHub is used to show work been committed on a regular basis. Personally, I could not get the repository assigned to us to connect to my front or backend, as such I created my own repository and forward the link to my supervisor, hoping that that will suffice for the project.
This only occurred to myself after I had written the main part of the backend. What I did was to create a repository for the back and front end separately and to commit to these at least weekly or when a major change had occurred to the code been written.
I believe that having the written work and Figma links in the Github repository made it unstable and would not sink with the version I was trying to push from.

6.2.3 Journal

A handwritten journal was good to keep close so when ideas arose, they could be jotted down and kept a record of. Having an idea of upcoming deadlines was also useful to know where the project was going and knowing if it was on track or falling behind. Waking in the middle of the night during the functional stage of the project, having the journal close to hand to jot notes down helped to keep track of progress also.

6.3 Reflection

Having gone through the process of the project and having the tools of Figma, GitHub and the Journal helped the application grow from an idea to a paper prototype, to a fully working application in lass then six months. Managing this would have been a whole lot harder without these tools.

7 Business Opportunities

7.1 Introduction

The business opportunities for this application are endless. There are not too many applications online like this, it's main opposition would probably be Instagram or Facebook but the likelihood of business's directly advertising to those platforms, as such they may like to target from a single source.

Firstly, for the business in the locality where the events take place may wish to advertise and promote their business within the application.

Autocare stockists also may be keen to take advertising space within the application to let users know of there proximity to the events and availability of stock for vehicles they cater too.

Car clubs may like to advertise their club to a crew new members from the application. There is a Nissan Z club that attend some car events and are welcoming of new members and others too.

Car sales personal may like to advertise their stock within the application to persons using the application.

Auto recovery specialists would be interested in attending these events as some of the vehicles attending could be 40-50 years old and may need assistance to get home.

Businesses with locations throughout the country may consider getting in touch to advise of the availability of such a location to hold future events.

7.2 Conclusion

The business opportunities for the application are good, with proper management it could be a good business development.

8 Conclusion of Major Project

8.1.1 Your views on the project

Undertaken such a project was overwhelming at the start but when it is broken down into fortnightly sprints makes it seem achievable.

8.1.2 Completing a large software development project

8.1.3 Working with a supervisor

Having the support of a supervisor and lecture staff of IADT made this project possible, without hum I would have been total lost.

8.1.4 Technical skills

8.1.5 Further competencies and skills

I enjoyed starting the project as the deadline seemed so far away, but when the finish line came close, I felt like throwing in the towel but only for John Dempsey and the support and guidance he gave me helped me realise, 1. I am not a programmer. 2. I will see a project through to the end regardless of the position I am in. 3. I know now that you have to believe in a project to see it through.

8.2 Conclusion

This project is not perfect but neither am I and I am pleased with what I have achieved in delivering it.