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RoadReady – A driving test route app

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## **Organisation / Motivation / Executive Summary**

In an era where technology influences every part of our lives, “RoadReady” stands out as a driver education innovator. Our objective with the app “RoadReady” is to reshape the journey from being a learner to a full licensed driver simply by the means of using a mobile app. Currently, our app establishes a strong foundation in traffic laws, regulations, and signs with a comprehensive collection of theory questions. As we look to the future, we are committed to offering learner drivers the access to real-time navigation, interactive maps and a variety of sophisticated tools. While our immediate aim is to guide users through their successful completion of their theory/driving tests, our ultimate goal is to ingrain competence, confidence and a deep understanding of safe driving habits that will last a lifetime.

The core of RoadReady is an elegant and highly intuitive user interface that revolutionises the educational app market. Our fully developed user interface (UI) is more than just visually appealing, it serves as an entry point to an extensive feature set that improves learning effectiveness and engagement. Firstly, learners are welcomed into an environment where plenty of practice questions mirror the difficulties that they will encounter in the real world while travelling. These questions are a way to establish strong foundation in traffic laws, rules and regulations and signs. Our app provides mock exams that simulate the format and pressure of the actual theory test in an effort to close the gap between practice and actual performance. In order for learners to master their time management and smoothly handle the conditions of exams, they must engage in this immersive experience. Learning is a journey and completing an exam is just the end goal. RoadReady recognises this by including a feature that carefully records the learners time and results. This analysis is extremely important for customising the learning path and enabling users to concentrate on their areas of weakness. RoadReady’s user interface creates a new standard for the industry. It proves our point that an educational app should be incredibly responsive and navigable in addition to having a great design.

As RoadReady continues to evolve, we would like to help learners become competent with their local routes and driving conditions by introducing real time navigation. This feature will improve the learning curve especially for those who have passed their Theory and now are awaiting their practical driving test by supporting custom made routes for each town with a test centre. We also aim to include interactive teaching resources such as tutorials and videos to cover essential driving skills and ensure a complete exam preparation. Additionally, we would like to warn users when they exceed the speed limit, the speed monitoring feature will promote careful driving.

RoadReady’s app development has been a lengthy one marked by a number of achievements and difficulties. Arvind used Figma to tackle the UI design, concentrating on the pages, responsive navigation and components such as the menu and navigation-bar. Using Firebase for the backend, Matthew managed the learning curves and its extensive feature set, especially in regards to database operations and read limits. Our team has come a long way in spite of these challenges. We’ve created a functional app that shows how the app could improve the theory/driving education. As we move forward, we will remain committed to addressing any technical challenges with creative solutions whilst delivering an exceptional user experience

## **Management report**

To complete the development of our app, we would need the following organisational structure:

**1) UI/UX Team (Us)**

Despite our small size, our team is capable of handling RoadReady's UI/UX design. We've taken on the task of developing an intuitive and attractive interface because we have a strong eye for design and user experience. We prototype and iterate on our designs using Figma and Locofy plugin to make sure they satisfy our user's needs. In order to achieve a high-quality product, we are dedicated to studying and putting design principles into practice, even though we understand what the expertise of a specialised UI/UX team could bring.

**2) Development Team**

As a duo, we have versatile skills that allows us to take on the frontend development ourselves, converting our Figma designs straight into React Native code with the help of the cutting-edge plugin called "Locofy". Our development process is made easier with this approach. However, we will need people with more backend experience to improve/add the app's essential features like advanced theory features, real-time navigation and connectivity with driving instructors. Working together with knowledgeable developers who can assist us in integrating complex features and guaranteeing the app's backend is reliable and scalable.

**3) Quality Assurance Team**

In order to guarantee that RoadReady is reliable and error-free, the Quality Assurance team is important. They will test every aspect of the application once developed, including the backend, functionality and UI. In order to troubleshoot and fix any issues, they would build test cases, carry out both automated and manual testing and collaborate closely with the development team. This will all contribute to the learner driver's safety.

**4) Marketing and outreach team**

For RoadReady this team will be committed to developing and carrying out a strategic marketing plan to advertise the app and interact with the intended audience. The team initiatives would be to include influencer partnerships, social media campaigns and community outreach.

**5) Customer Support**

In order to guarantee that users have a positive experience, the Customer Support team will be there to respond to user's questions, fix technical problems and offer help with the features of the app. This will help in community building and app improvement.

(Organisation chart in appendix)

In a small-scale project like ours, project management responsibilities are often shared between us, for example, managing tasks such as planning, scheduling, and coordinating with each other.

In the long term we may need:

Project Manager (scaled business):

A Project Manager is key in co-ordinating the development of our app, who would plan, organise the team, oversee resources and interact with stakeholders. They would monitor the user experience closely and prepare for a smooth launch, while making sure the project meets quality standards, doesn't go over budget and advances the goals of improving learner driver's abilities.

## Activity log of each team member

Arvind:

[https://docs.google.com/document/d/1\\_1JCU4DvjcGoWfTPyfkEbimEND3G2tQdDDJsppz6wBE/edit?usp=sharing](https://docs.google.com/document/d/1_1JCU4DvjcGoWfTPyfkEbimEND3G2tQdDDJsppz6wBE/edit?usp=sharing)

Matthew: <https://docs.google.com/document/d/1WmVI1RzPXkPMwdzs-JNZk7ShrCdf5sGPymmWw1CArg/edit?usp=sharing>

## Business Case

### RoadReady App description

Our main objective for RoadReady is to revolutionise the learner driver's education. RoadReady acts as a comprehensive platform that gives users a deep understanding of traffic laws and safety in addition to helping them get ready for their driving exams. It simulates a range of driving conditions and scenarios by incorporating interactive learning tools like interactive maps, real time navigation, and customisable routes. The large collection of practice questions and theory questions in the app guarantees that users are adequately ready for the theoretical portion of their driving tests. Furthermore, the app allows users to find driving instructors to help them complete their mandatory 12 essential driving training (EDT) lessons. With the help of the app's innovative approach to driver education, learner drivers will be better equipped to handle the roads safely and pass their driving tests.

We provide an extensive collection of interactive and user-focused features on our app. Although real-time navigation for test routes is not possible at this time, the app makes up for it with the sample maps that are detailed for familiarising users with the route, a database of set theory questions for test preparations. Our app also helps users finish required courses like the 12 EDT lessons by facilitating interactions between learners and driving instructors. This feature guarantees that learners are prepared for both the theoretical and practical components of driving exams.

The user experience has been designed to be simple, entertaining and instructive. This ensures that learners will not only get ready for their theory/driving exams but will also find

the process enjoyable. Users can effortlessly navigate through the features of the app, thanks to its intuitive interface, which was designed to be clear and easy to use. Users can concentrate on particular areas for example if they have already completed their theory test, they can move onto the driving test part of the app where they can begin learning the routes, manoeuvres and key driving knowledge through the interactive maps. Completing required EDT lessons is made easier by the ability to connect with driving instructors thought the “find driving instructors” page. All things considered, “RoadReady” places strong emphasis on a user centric strategy that blends technology and instruction to promote competent, assured and safe drivers.

In the crowded field of driving education apps, RoadReady stands out by providing a better user experience than just a large library of theory questions. In contrast to other apps, RoadReady has an excellent UI, offering a clear, simple, and error-free setting that improves learning. Although other apps frequently encounter problems with real time navigation, we aim to concentrate on interactive route planning and familiarisation, which is more in line with our existing capabilities and user needs. To make the process easier for users, our app integrates the entire range of driving preparation, from theory to real world driving tests and offers a direct connection to driving instructor so learners don't have to go in search elsewhere. When it comes to learner drivers looking for a comprehensive and seamless driving education program like RoadReady stands out due to its functionality, design and all-in-one approach.

## Value Analysis

Learner drivers look for resources along the way to acquire a full driver's permit that will help them pass the driving test and develop confidence and competence as a driver. In this project, RoadReady shows up as a significant solution providing a multi-functional platform that goes beyond conventional teaching techniques. The purpose of this value analysis is to break down the essential elements of RoadReady looking at how its features fit with the learner's needs as well as the larger driving education goals. We'll look at how the app appeals to a tech-savvy generation, how it stands out in a market full of traditional educational resources and how it manages to combine convenience and in-depth learning. We will explain the distinct values that RoadReady offers to driving institutions as well as individual learners by exploring the user experience customer benefits and the app's unique features.

RoadReady broadens its value proposition to include driving instructors and driving schools, who can utilize the app as an additional resource to improve their curriculum. They may not be the learners' direct customers, but they still have an impact on their decisions and can suggest RoadReady as a favourite study app. Essentially, RoadReady fulfills two purposes: it offers learner drivers a customized learning experience and possibly functions as a resource for driving educators.

## Users and customers

The main customers and users of our app are people who are learning to drive and are in the process of getting their license. Teenagers and young adults who are comfortable using mobile applications as learning tools and are tech-savvy make up this demographic. They

look for quick, easy, and successful ways to get ready for the written and practical parts of driving exams. As well as interacting with the app's content, learner drivers are also customers who base their app purchases on the value they believe the app will bring to their educational journey. This audience is served by RoadReady which provides an extensive feature set tailored to their needs, including learning how to drive safely, comprehending traffic laws, and becoming accustomed to the format of the test.

### User needs and goals

- In order to become confident on the road and responsible drivers, learners must meet specific needs. Their main requirements are to pass their driving/theory test, gain real-world driving experience and have a solid understanding of driving regulations. The desire for a powerful and flexible structured learning path forms the base for these needs. RoadReady's feature set satisfies these requirements by offering:
- Comprehensive Theory Learning: With the app's large collection of theory questions and answers, users can fully understand driving laws and regulations. Ensuring safe driving practices and passing the theory test both depend on this foundation.
- Practical Test Preparation: We will provide interactive maps and route planning features that let learners visualise and practice test routes, improving their spatial awareness and practical driving skills. However, real-time navigation is not yet possible.
- Instructor Connectivity: One of RoadReady's most notable features is its ability to link students with licensed driving instructors for their required EDT lessons. This simplifies the process of scheduling lessons and finding qualified instructor, which is often a challenge for new drivers.
- User-friendly Design: RoadReady has an appealing and user-friendly interface that encourages learning and navigation for users of all tech products.
- All-in-one: RoadReady sets itself apart as an almost all-in-one app by combining several aspects of driving education into a unified platform. It offers wide ranging features that cover every factor of a new driver so there is no need for multiple apps or resources. RoadReady provides an unmatched, comprehensive learning experience, encompassing everything from theory preparation with a large question collection to actual route planning as well as being able to get in touch with driving instructors.

### Organisational value

RoadReady has organizational value as it can be a useful tool for instructors and driving schools, improving learning and providing a modern approach to driver education. The following is how RoadReady benefits an organization:

- Improved Teaching Resources: By incorporating "RoadReady" into their curriculum, driving schools can offer a mixed learning experience by utilizing its interactive maps and adaptable learning pathways to supplement in-car instruction.

- Progress Tracking: Instructors can use the app to keep an eye on the learner's development, spot areas in which they still need to practice, and adjust their lesson plans accordingly.
- Resource Efficiency: By utilising "RoadReady," organisations can take advantage of the app's current content and lessen their reliance on physical materials, which can save money and have a less negative impact on the environment.

Apart from driving schools, RoadReady can provide organizational value to a range of stakeholders in the car and education sectors. Here are a few examples:

- Government Organizations: Road Safety Authority (RSA) or similar organisations may incorporate the app to make sure learners are more exam-ready, which may increase pass rates and improve traffic safety.
- Non-Profit Organizations: To encourage safe driving among newly licensed drivers, road safety advocacy groups may incorporate "RoadReady" into their campaigns.
- Insurance companies: By collaborating with "RoadReady," they could provide discounts to students who successfully finish tasks, encouraging safer driving practices and possibly lowering the insurance claims.

## Market analysis of the target market

### Proposed market

The proposed market for RoadReady app is learner drivers in Ireland, a constantly growing group of people looking for practical resources to help them deal with the challenges of getting their provisional and full driver's permit. The results of our research provide strong evidence for the existence and stability of this market:

#### Smartphone users:

- As of 2023 there are **3.99 million smartphone users** in Ireland [1]

#### Theory test conducted:

- The Driver Theory Testing Service conducted that in 2021 it received **201,915 tests** with a **74% pass rate** for learners.
- These learners actively participate in the testing process, demonstrating a need for useful study materials.

#### Learner Permits:

- In 2016, there were **249,647 drivers holding only learner permit licenses** [2].
- **60,000** of those drivers were **waiting for their driving test last year** [3].

#### Findings from Primary Research:

Direct Engagement: We conducted focus groups, interviews and surveys to have direct communication with our target audience which consists of driving instructors and learner drivers.

User perceptions: Positive feedback was received largely on proposed features like personalised route planning and instructional materials, suggesting a good fit between the product and the market.

Feature Validation: Our app's concept was validated by the common theme of the need for a comprehensive, user-friendly app that combines theory and practical learning.

### **Findings from Secondary Research:**

Market Trends: There is a growing trend toward mobile learning platforms, with an emphasis on interactive and multimedia content, according to an assessment of industry reports and publications.

Competitive Landscape: RoadReady is well-positioned to connect the gaps in the current product offering, particularly in terms of providing an integrated learning experience.

Demand Analysis: Learner drivers have a clear need for a modern, all-in-one driving education app.

<b>Total Addressable Market</b>	Total potential users (those that completed their theory test and drivers holding learner permits/those waiting for their driving test).	TAM = No. of Learner Drivers = 201915 + 249647 = 451,562 <b>≈ 450,000</b>
<b>Served Available Market</b>	The people that have access to the resource i.e. mobile phones that can access apps	SAM = TAM * assumed percentage of adults with smartphones = 450,000 x 0.90 <b>≈ 405,000</b>
<b>Target Market</b>	Based on interviews and feedback	TM = SAM * % of users willing to use our app. = 405,000 * 0.75 <b>≈ 300,000</b>

## **Value Propositions**

### **Commitment to Learner Success**

Our app offers a comprehensive list of driving test routes from different test centres across Ireland, ensuring users are well-prepared for their driving test no matter where they are situated. We host a wide range of information about road regulations and examples of different driving scenarios to instil confidence in learners through a better understanding of the road. Unlike the current market where learners receive information about road regulations through the Rules of the Road booklet, our app allows learners to always have access to this information with additional tips. Our App provides a list of driving routes in the free version, setting us apart from our competitors who offer this as a premium feature. Furthermore, we integrate different learning features such as questionnaires, progress tracking, interactive lessons, and a wide range of road regulations and scenarios all in one

application. This holistic approach enhances the learner's journey throughout the driving examinations, making it efficient and effective by saving time, money, and storage.

### Innovation in Navigation (To Be)

Our advanced satellite navigation system, developed by our talented team, provides real-time guidance and assistance through traffic updates, adaptive route planning, live feedback, and route correction. This ensures a stress-free learning environment and allows both the learner and instructor to focus on driving and observation. In the current market where there is only a basic navigation system for learners, our app stands out through traffic updates, adaptive route planning, and live feedback. We've prioritized user experience by delivering a well-designed, user-friendly interface with extensive functionality. Our app is easy to navigate and offers a smooth learning process. The app comes with a responsive screen allowing the same experience no matter what device the app is used with. Our app has extensive functionality through small features such as daily tips, and bigger features such as adaptive feedback.

### Empowerment through Open-Source (To Be)

Our app provides an open-sourced test route creator mode, which empowers learners to create personalized routes to tailor their practice to their needs. This also allows learners to practice without an instructor's assistance to prepare for ongoing lessons. This feature sets us apart by creating a competitive environment where the best routes are refined and shared with the community, promoting collaborative learning.

## Proposed User Segments

RoadReady targets multiple user segments within the learner driver population, each with specific requirements and attributes that the app is made to fulfil:

New Learner Drivers: People who have recently started their driving education and are looking for thorough resources to get them started. This segment values the theory test preparation and learning.

Pre-Test Learners: Individuals who need a lot of practice and review before their theory or practical driving tests. RoadReady helps these users reinforce their knowledge and abilities by offering focused practice questions and route planning.

Learners who lean toward technology: A group that favours online resources over conventional teaching techniques. This group finds RoadReady appealing because of its mobile accessibility and interactive features.

Driving schools and instructors: Although they are not direct users, they have an impact on how learner drivers make decisions. RoadReady can be used by teachers as an additional resource to improve their teaching methods.

## Key resources, costs, revenue streams and activities

### Key resources

- Skilled development team  
Our Primary key resource is our development team who will be creating our app and improving the app on release. The development team will consist of **3 software developers and 1 software tester** which could scale with the size of the app. This dynamic will ensure that the app will be developed to a high standard.
- Customer Support Team  
Our next resource is our customer support team which will consist of a minimum of **1 Customer Service Representative**. This team will answer any user questions and maintain a positive moral for our community. Like with the development team this team could scale with the size of the app.
- Firebase  
Firebase will deal with the backend of the app by hosting the app, storing the database information, and dealing with authentication for the app. This is essential for the app to function and will store the route information and road regulations which will be 2 of the 4 main functions.
- Gitlab  
This will be where the development manages the main repository, upload their individual code, and test new pushes to the main branch. This resource will help manage the overall state of the app.
- Trello  
This resource is how the development team will create stories to work on, manage which state each story is in, and whether the stories are completed and pushed, or the story ran into issues.
- Play Store & App Store  
This resource is how the customer will buy and download our app. They Play Store will be for Android device users and the Play Store will be for IOS device users.

### Cost Structure

#### *Initial Costs*

Our initial costs are for location, salaries for our development team, and equipment. The First cost is for location this where our development will operate, and our equipment will be housed. The location we have chosen is Two Dublin Airport Central, Dublin Ireland, Swords, Co. Dublin.[1] This will cost us a total of **€1,589 per month** and comes with reception, furniture, Wi-Fi, and printers. Then a **one-time cost** is needed for the office which would be the equipment which will include laptops and monitors. The **laptops** we have chosen are P 15s-fq4577sa 15.6" Laptop - Intel® Core™ i7, 512 GB SSD, Silver [2] with a cost of **€700** each adding to a total of **€2,800** which will be **4 laptops** for our development team and additions will later be made for the customer support team. The monitor we have chosen is PHILIPS 242V8LA Full HD 24" LCD Monitor – Black with a price of €119, totalling €476. [3]

#### *Development Team*

The next costs are salaries for our development team, the median cost for software developer salaries is **€50,122** [4] which abdicates to **€4,176** per month, and with the size of

the app at the start, we only need **2 developers** at this point adding to a total of **€8,352** per month. The final addition to the development team will be a Software Tester with a median salary of **€33,730** with a monthly cost of **€2,810** this cost plus the total cost for our developers is **€11,162** for the development team per month. [5]

### *Operational Costs*

Our app will be hosted using Firebase this will start with no initial cost but if we predict an amount of 250,000+ users the price will scale to **€862**. [6] When the app is developed the cost to place our app on the Play Store is **€25 per submission** but there is a cost for placing our app on the iOS App Store which is **€92 annually**. [7]

When the app is live, we will need to hire a customer support team to deal with ongoing customer queries. The median cost for a **Customer Service Representative** is **€27,221** [8] which would be **€2,268** a month. We will start with 1 CSR, but this could scale with the size of the community of our app. They will also need a laptop and a monitor which will add to **€819** for each CSR.

### *Marketing*

#### Ads

One of the ways we have chosen to promote our app is through YouTube advertisements. YouTube advertising costs between **€ 0.10 - € 0.50** per view which we will set a daily budget of **€10**. [9] This will add to a total of **€300** per month. As the majority of our Target Market are students, we will advertise during peak times which is when they will be finished school for the summer. We will advertise for the months of April because this is when our app releases, and from **May to October**. We will finish advertising at the end of Autumn as the roads will be more dangerous during the winter due to snow and ice.

#### Content creators

Another way we are promoting the app is by paying famous Irish influencers to make a post about our app. This is beneficial because they are students themselves hosting an audience of peers the same age. We will pay 2 influencers one male and another female to reach the most people. They both have a following of just over **100,000 followers** meaning the price for **each post** we request will be **€1,000** [10]. We will request posts **1 each for the month of April** for when our app releases, and 1 each for **May and June**, this will be the start of summer depending on if the students are in secondary school or college.

### *Revenue Streams*

- In-app purchases:  
firstly, we will have a **freemium model** which will be used to attract the users and allow them to experience the value it provides. The free version will include access to all theory questions, a limited number of predefined routes and a subset of educational content with some ads. We will have a **premium model** which will be subscription based. It will include access to all the feature and a seamless ad-free experience. For this subscription the user will be able to choose between monthly (€4), quarterly (€10), and annual subscription (€35) to provide flexibility for users. A **free trial** for 2 weeks will also be available for all new users to help them understand

the value of the app and in turn increase their likelihood of subscribing after the end of the trial period. (see appendix for pricing process)

- Advertising revenue:

To gain revenue from within our app, we will display dynamic ads at the top or bottom of the screen. The ads will be related to driving, automotive industry, or road safety. There will also be some video ads for users that use the app for an extended period. We will however ensure that the ads are non-intrusive and do not disrupt the user experience. We could generate from as low as **€0.10** and as high as **€10**, depending on the type of ad and place to advertise. [11]

## Activities Required

- Market Research and Analysis:

- The first activity is determining the Target Market for the app, which stated above we have determined to be 300,000.
- The next activity is to discover the customers pains which we found by creating a Value Proposition Canvas (VPC). The main pains from each VPC are:
  - Lack of confidence with driving ability
  - Confusion with unfamiliar roads

- Prototype Development:

- Another activity is to create a prototype of the app to demonstrate the core functionalities of the app. We have created a prototype for the app and began user testing to receive feedback for the app and catch potential bugs, find improvements that can be implemented.
- Next to prepare for possible increase in scale of the app. To do this we used Firebase's "Pay As You Go" pricing which requires us to pay for additional storage as we use it. Firebase allows us to read 50,000 documents for free a day but if we were to exceed this limit, we only need to pay for the additional reading used.

- Business Model Development:

- Define revenue streams, pricing strategies, and distribution channels.
- Determine cost structures, including manufacturing, marketing, and operational expenses.

- Marketing and Branding:

- Create a compelling brand identity and messaging that resonates with target customers.
- Implement marketing campaigns across various channels to generate awareness and drive sales.
- Monitor marketing metrics and adjust strategies based on performance.

- Customer Support and Feedback Loop:

- Establish channels for customer support and feedback, such as helplines, chat support, or online forums.
- Gather customer feedback systematically and use it to improve product features, user experience, and customer satisfaction.

## Supporting industry trends

A number of important developments in the driving education space are encouraging the creation and availability of applications such as RoadReady. The following are a few notable trends:

- **Increased Focus on Customer Experience:** In the driving school sector, the importance of the customer experience is becoming increasingly apparent. Companies are using technology to enhance all aspects of their operations, including scheduling and learning outcomes. [12]
- **Personalized Marketing:** Personalized marketing campaigns are growing in popularity as companies look to improve the customer experience. This includes developing customised campaigns and having a thorough understanding of the target audience. [12]
- **Virtual reality and artificial intelligence (AI/VR):** These technologies are starting to influence education by providing advanced analytics for performance tracking and practice-oriented simulated environments. [12]
- **Government Initiatives:** Local government programs may encourage the use of technology in driving instruction and may provide financial support for innovative technological solutions that increase traffic safety. [12]
- **Transition to Electric and Hybrid Cars:** The automotive sector is adjusting to the growing popularity of electric and hybrid cars, which might call for the development of new instructional strategies and educational resources. [13]

## Competitor Profiles & Competitor Benchmarking for RoadReady

As "RoadReady" joins a competitive field of driving education apps that already has a number of well-known competitors. There are several competitors that provide learner drivers with a range of features.

### Competitor Profiles

#### Irish Driving Test Routes

- **Features:** Provides turn-by-turn directions and live navigation on practice routes.
- **Limitations:** There is a lack of additional features that could improve the learning process and the user experience is not flawless.
- **Pricing Model:** Offers a single route for free, with the option to subscription access to more.

#### Driver Theory Test Ireland, iTheory, and Official Driving Theory Test

- **Focus:** With a variety of practice questions and mock exams, these apps mainly focus on helping users prepare for theory exams.
- **Free vs Paid Features:** These applications typically charge for full access and offer a limited number of features for free.

- **Pricing Model:** "Official Driving Theory Test" charges a one-time fee for full feature access, which sets it apart from other apps.

### Benchmarking 'RoadReady' Against Competitors

- **User Experience:** RoadReady seeks to deliver an improved user experience with a user-friendly interface and fluid app navigation.
- **Features:** In contrast to "Irish Driving Test Routes", RoadReady will provide a wide range of features, such as instructor connectivity, educational content, and theory test preparation, in addition to route practice.
- **Pricing Strategy:** RoadReady will assess the market to identify the most user-friendly pricing structure, taking into account one-time and subscription payment options to increase value and ease of access.
- **Innovation:** RoadReady distinguishes itself by incorporating the newest developments in educational technology and trends, assuring that students have access to the most recent and efficient resources.

### Our competitive advantage

In the market for driving education apps, RoadReady stands out for a number of key competitive advantages:

- **All-in-One Platform:** RoadReady gives a wide set of features of that address every aspect of learning to drive, from theory to practical skills and instructor connectivity, in contrast to competitors that concentrate on either practical or theory test preparation.
- **User-Centric Design:** The application is created with a primary emphasis on the user experience, guaranteeing that the user interface is simple to use, captivating, and free of the glitches that some rivals have trouble with.
- **Technology Integration:** RoadReady keeps ahead of the game by utilising the newest technologies and providing features that are in line with educational trends.

### Three-year financial projection

- Evidence of primary and secondary research to validate the proposed offering's suitability for the market (3-4 page summary with additional detail in the appendix).

## Evidence of Research for RoadReady

### Primary Research

#### Overview of the Survey

A survey that was part of our primary research was used to determine the features and price points that our target audience found most appealing, as well as the degree to which the market was ready for "RoadReady."

### **Survey Questions and Responses**

- 1) Learner's Permit or Driver's License Holding:
  - **Responses:** Of the 18 participants, 72.2% confirmed owning license or permit, representing a large portion in our target demographic.
- 2) Feature Priorities:
  - **Responses:** Using a scale of 1 for "not important" to 5 for "extremely important," participants assessed the following features:
    - Theory Test Practice: Importance ratings were inconsistent, indicating a range of user needs.
    - Driving Test Routes: These receive higher ratings and are generally considered important.
    - Instructor Connectivity: Showing a niche need, it is rated as moderately important.
    - Educational Content: It tends to be more important.
    - Progress Tracking: Shows a desire for measurable learning outcomes and is regarded as moderately to extremely important.
- 3) Pricing: Responses ranged from €0 to €6 when asked about the maximum monthly subscription fee. This suggests price sensitivity and the necessity of a competitive pricing strategy.
- 4) Preferences for Learning Styles: It was clear that users preferred interactive activities and practice exams, which highlights the value of the app's useful and interesting learning resources.
- 5) App Usage Frequency: Showed a commitment to regular practice among potential users, with usage split between several times a week and daily.
- 6) Measures of Success: Passing the test, getting better at driving, and having more confidence were the main markers of success, highlighting the app's possible influence on users' driving proficiency.

The development of RoadReady as a thorough driving test preparation app is supported by the survey results. We can create a feature-rich app with a flexible pricing model that takes into account our users' financial constraints because the data points to a market with specific feature preferences and pricing sensitivity. (see appendix for graphs/chart)

## **Secondary Research**

### **Competitors**

Several insights were revealed by examining competitors and current offerings in the driving apps market:

- Feature Gaps: A lot of the products on the market today only concentrate on providing theory or hands-on practice for exams, which leaves a need for a comprehensive solution.
- User Experience: A smooth user experience is essential for keeping and satisfying users, but there aren't many apps that combine this important aspect with a feature-rich feature set.

## Financial Requirements

In order to bring this project to completion there are 5 Cost Requirements that will need to be fulfilled, Revenue Streams, Set-Up Costs, Development Costs, Operational Costs, and Loan Repayments.

### Set-Up Costs

For the set-up costs we need an office location to house our development team. As stated in the cost structure we have chosen a location in Swords, County Dublin with a rent cost of €1,589 a month. The next cost is to buy laptops for the development team with the laptops we have chosen (see Cost Structure) pricing €700 for the 4 members of the development team totalling €2,800, with the accompanying monitor pricing €119 each totalling €476. The next cost is for Renters Insurance pricing at €491. The last cost is the collection of the first month salaries for the development team totalling €11,162. The total cost to Set-Up the app is €16,518.

### Development Costs

Stated in the Cost Structure the total cost for the development team is €11,162. With the potential growth of the app the development team may need to be expanded with adding a Project Manager and a Scrum Master to manage creation of new features while having a new team to deal with bugs across the app. With Project Manager having a median salary of €54,000 adding €4,500 to the development costs and Scrum Master having a median salary of €57,000 adding €4,750. If the app accumulates a significant amount of users expanding the development team will be required which if we double our development team and hire a Project Manager and a Scrum Master could potentially total to €31,574 a month.

### Operational Costs

Our operational costs is €862 if our user count exceeds 250,000, A €25 submission to place the app on the Play Store and €92 annually to place the app on the IOS App Store. With active users we will need to hire a Customer Service Representative (CSR) to deal with customers queries and difficulties with a salary of €2,268 a month. As the user base grows the more CSR's we will need to hire to manage all the queries. Each CSR needs a laptop and monitor totalling €819 each. This totals to an Operational Cost of €4,066+ scaling depending on how big the user base is.

### Loan Repayments

In order to afford the previous costs we need a Loan. Using Bank Of Ireland loan calculator we have calculated to receive €120,000 which will be repaid over 60 months, this calculates

to €2,378 a month. The loan will be able to pay for Set-Up costs, Operational Costs, Development Costs and Marketing Costs until the app can become profitable.

## Justification of Costs

According to Statista [14], the Apple App Store had 470 million educational app downloads in the first quarter of 2020, while Google Play had 466 million downloads in the same period. Both platforms had their highest reported educational app downloads in this quarter, due to the COVID19 pandemic that caused a surge of online learning demand. If each download represents a new user, this means that the average user growth rate of a new educational app in this quarter was about  $(470 + 466) / (455,000 / 2) = 4.12\%$  per app, where 455,000 is the number of education apps in the Google Play and Apple App Store in 2024, according to Business of Apps. [15]

Using our target market of 300,000, if we multiply 4.12% by 300,000, we get 12,360 users in our first month. According to Statista [14] there were 470 million App store downloads out of 936 million i.e. 50.2% for Play store there were 466 million downloads out of 936 million i.e. 49.8% [14].

From the 12,360 users per month we multiply it by 0.502 to get 6,205 total apple users per month, then multiply 12,360 by 0.498 to get 6,155 total android user per month. From there we multiply the android users by 0.035 to get 217 android users willing to pay per month, if we then take away the 215 from 6,155 we get 5,940 android users not willing to pay. We then repeat the process for apple users 6,205 multiplied by 0.077 to get 477 apple users willing to pay and take that away from 6,205 gives a total of 5,728 apple users not willing to pay [16].

Next, we multiply the android users not willing to pay by 0.29 to get the total ad revenue of €1,737 for android users, we then do the same for apple we multiply the apple users not willing to pay by 0.2 will get a total ad revenue of €1,147 for apple users. Next we add the 2 totals will give us €2,868 for our total ad revenue [17].

Lastly, we need to deal with retention, for the first month April we gained 12,360 then we retain 43% which equals to 5,315. Then for May we gained 12,360 adding this to the total we retained gives us a new total of 17,674 total user for May. For June we retain 43% of the new users from May and 34% of April's users giving us a new total of 21,877 total users for June [16].

### *Loan*

We used Bank of Ireland to calculate the monthly payments. Since the maximum amount we could request without requiring additional communication with the bank was €120,000, we based our calculations on this figure. Considering our ability to repay this amount comfortably over a period of 60 months, it seemed to be a reasonable choice. The interest rate that was offered to us was 7.05%, resulting in a monthly repayment of €2378.98 and a total repayment of €142,738.54 over the loan term. In the first year, our average monthly revenue amounted to €11,827. While we intend to use our personal savings the loan repayments for the first few months for the development of the app we will be able to use the revenue that we make by the end of April. By the end of the year, we observed that we would have a strong upward trend. [Insurance Quote in appendix] and [18]

### *Insurance*

We obtained a quote for our business insurance using chill insurance which amounted to €491. Our specific coverage only included protection for three of our developers and support staff and the building itself, with no need for coverage of the contents. [Business Loan Calculator in Appendix]

### *Financial projections:*

In year 1, our findings indicate that the company will increase steadily in revenue from April to December. Starting with a revenue of €5,641 in April, we see our revenue growing to €16,527 by December. This represents a significant growth over a period of just eight months (given that the first are for the development of the app so there's no income)

The growth trajectory suggests a strong upward trend, with the company's revenue increasing each month.

We used the Compound Annual Growth Rate (CAGR) to calculate the average annual growth rate from the 8 months.

$$CAGR = \left( \frac{\text{End Value}}{\text{Start Value}} \right)^{\frac{1}{\text{Number of Years}}} - 1$$

When we plug-in our figures, we get:

$$CAGR = \left( \frac{\text{€16,527}}{\text{€5,641}} \right)^{\frac{1}{0.67}} - 1$$

for this year one our CAGR is approximately 158.03%.

Based on these findings, we project that the company's revenue will continue to grow at a similar rate in the coming years. Using the CAGR, we have projected the monthly revenues for years 2, 3, 4, and 5. For instance, the projected revenue for January of Year 2 is €17,648.79, and this figure grows to €38,651.62 by December of the same year.

With careful planning and strategic decision-making, the company is well-positioned to sustain its growth and achieve its financial goals. While these are only just projections, the actual revenues may vary due to changing market conditions, business strategies and other factors. (see appendix for chart)

## Technical Delivery

### Project Scope

#### *Goals*

The goals for the app is to assist learner drivers into passing their theory and driving test through giving the user confidence in their driving ability. The key goals needed in order to achieve this are; Educational Content Organisation, Learning Tools, Progress Tracking, and Feedback.

- Educational Content Organisation:  
This goal is to gather all necessary information relating to Road Safety. This information will be the “Rules of the Road” booklet, a condensed Road Sign material, Driving Instructors tips, and material on common mistakes. This goal we aim to gather as much educational material on the Rules & Regulations of the road in one place to prevent learners from needing to hire different Instructors to get different tips & tricks or to find additional material that’s not in the “Rules of the Road” booklet.
- Learning Tools:  
For learning tools, the goal is to make interactive quizzes, flashcards, and other tools to maximise the users learning experience. Different users learn better in different ways so a collection of different tools will better suite different users.
- Progress Tracking:  
The goal of Progress Tracking is to track users progress throughout their experience with the app. This can be done by saving any quiz/test results or allowing users to update a log of each driving lesson.
- Feedback:  
This goal is to provide the user with feedback to help the users develop and improve. The feedback given needs to be accurate and inciteful. The more accurate the feedback the better the user can develop on it.

### ***Deliverables***

Authentication: To allow users to have a unique experience with different information displayed on specific pages based on the user. An example of this would be the test history page will change based on the user where each user will have taken a different number of tests with different scores.

Practice Quiz: A practice quiz will allow users to practice their current knowledge and prepare for a real test situation. Another separate quiz to specifically practice road signs which will occur in both the theory and the theory portion of the driving test.

Intuitive UI: A user friendly interface will allow users to easily navigate the app with interactive elements and clear instructions.

Route Creation: A route creation feature will allow users to plan out routes to practice. Each route can be used to practice different manoeuvres of the driving test such as hill starts, reverse around the corner etc. Driving Instructors can also create routes to share to their learner. Instructors can also publish their routes for other users on the app to follow.

Instructor Finder: An Instructor Finder feature will allow users to find Instructors in a specific county, by their rating given from other users, and by their name. This will allow users to easily get into contact with the best Instructor for them while also giving independent Instructors more business.

### *Tasks*

Research: The first task was to research competitors, determine the Target Market, interview target audience to see what they want from the app, and to analyse existing driving theory materials.

UI Design: The next task was to make the first draft of the UI design which will give a general idea of what the app will look like and to also start getting feedback to improve on the UI.

Development: This task is the creation of the app by creating a prototype of the app that can be developed on throughout the span of the project.

Quality Assurance: This next task is for testing the app, finding bugs and then fixing the bugs. Once the bugs are fixed start the testing again. This allows the app to run efficiently and giving the users the best experience.

Launch: This task will handle the publishing the app on both the Play Store and IOS App Store. Once this is done the next step is handling the influx of users.

Maintenance: The last task is to maintain the app by fixing bugs and updating the app, expand database if needed, and handle customer issues.

### *Costs*

Set-Up Costs: Set-Up cost is for office rent and team equipment team equipment.

Development Costs: Development costs is for hiring a development team to work on the app.

Operational Costs: Operational costs is for publishing the app on each platform, repairing hardware, and expanding the database, development team, office space etc.

Marketing Costs: The Marketing costs is for YouTube advertisements and Influencer posts.

### *Deadlines*

Timeframe: The timeframe of the project is starting at the 28<sup>th</sup> of September and finishing at the 22<sup>nd</sup> of April.

Research: The first deadline was a number of deadlines combined into one iteration which we called the Research & Development Iteration which had a timeframe of the 28<sup>th</sup> of September and concluding on the 20<sup>th</sup> of October housing the following deadlines: researching the target market, competitors, creating a homepage for the app, implement firebase and create the Project Proposal and Ethics Approval. All deadlines were delivered on time apart from the firebase implementation which took a bit longer being implemented on the 3<sup>rd</sup> of November.

Nov 03, 2023



Merge branch 'firebase\_implementation' into 'master' ...

Matthew Vincent Mahon authored 5 months ago

Authentication: The next iteration started on the 21<sup>st</sup> of October and concluded on the 14th of November. This iteration had the deadlines: implement SignUp, SignIn, SignOut feature and implement the Learning Material Feature. This deadline had a few unforeseen bugs and was not delivered until the 21<sup>st</sup> of December. Due to time constraints the Learning Feature was not implemented and a link to the “Rules of the Road” booklet was used as a replacement.

Dec 21, 2023



Merge branch 'navigation-fixes' into 'master' ...

Matthew Vincent Mahon authored 3 months ago

Theory Quiz: The next iteration started on the 15<sup>th</sup> of November and concluded on the 25<sup>th</sup> of December. The deadlines were: create theory questions, create result feedback, make the quiz dynamic. Due to delays in the previous iteration this iteration had a delayed release, and the Midterm Delivery was completed in its place. These deadlines weren't completed until the 14<sup>th</sup> of April.

Apr 14, 2024



Merge branch 'Theory\_Qs' into 'master' ...

Matthew Vincent Mahon authored 5 days ago

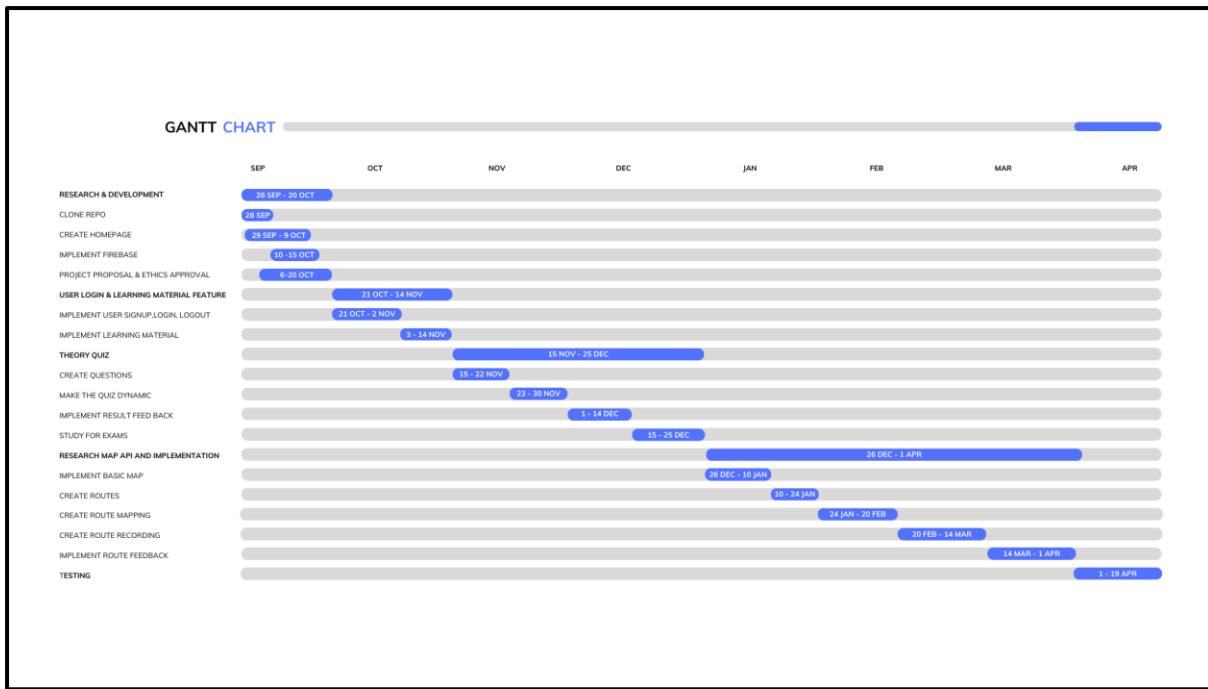


Added Quiz to Theory test

IamMatt117 authored 5 days ago

Research and Implement Map API: This iteration was planned to start on the 26<sup>th</sup> of December and conclude on the 1<sup>st</sup> of April. Due to significant delays this iteration was not able to be started. The planned deadlines for this iteration were: Implement the map, create predetermined routes, implement the create routes feature, and create route recording.

Testing: The last iteration was started on the 1<sup>st</sup> of April and concluded on the 22<sup>nd</sup> of April. Thanks to this iteration time was planned to do user testing and fix bugs that was otherwise undetected.



## Risks and Assumptions

### Risks

#### **Technical Risks:**

Technical challenges that could arise are from limitation with reading, writing, and deleting to the database. With Firebase we get 20,000 writes a day for free, we get 50,000 reads a day for free and we get 20,000 deletes a day for free. We solved this potential problem with using a “Pay as you go” feature which allows us to pay for any additional read, writes or deletes that exceeds the free limit.

#### **Timeline Risks:**

Timeline challenges that could occur are delays in development to get approvals for Project Proposal, and Ethics. Other delays in developments could be from other assignment deadlines, studying, exams, and spending time in lectures and working in current employment.

#### **Security Risks:**

Security challenges that could arise are data breaches to the database, unauthorized access, vulnerabilities in the code that could be exploited.

### Assumptions

#### **User Behaviour:**

We assume user have an IOS or android phone, that they are familiar with downloading an app, that they are familiar with signing in and signing up for an app, they have a willingness to engage with educational apps, and we assume they are motivated to using an app to prepare for their theory and driving test.

## Content Availability:

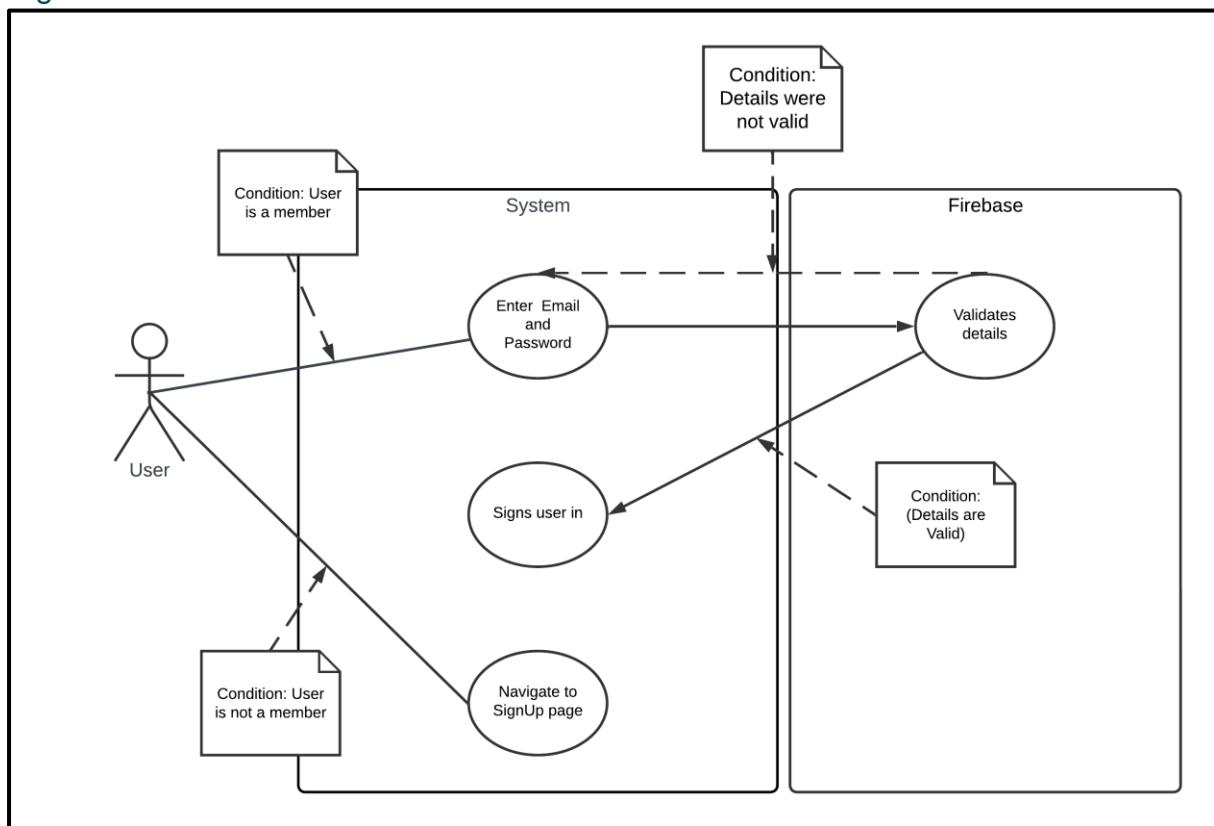
We assume that we will have access to educational content, will be able to cooperate with driving instructors, that we will not require licensing to use the educational content, and that the instructors will consent to allowing us to use their information.

## Technical Infrastructure:

We assume that we will have internet connectivity, device compatibility, and cloud services available to host the app. We assume that any dependency used will be compatible with other dependencies.

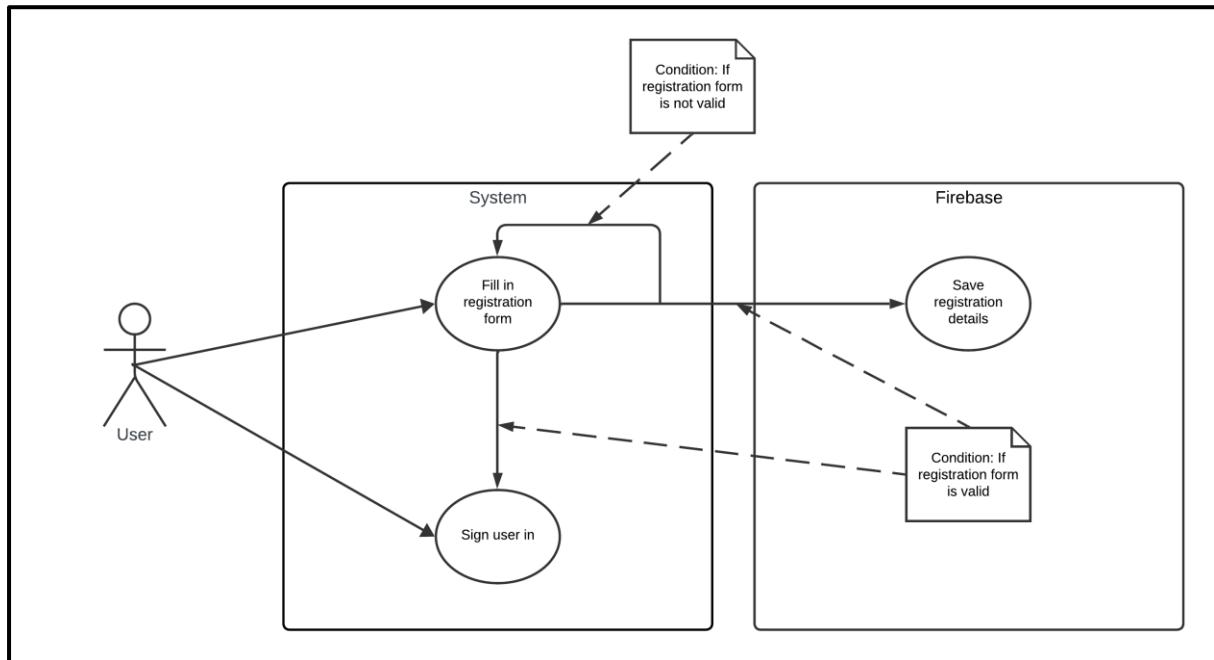
## Use Cases

### Sign In Use Case



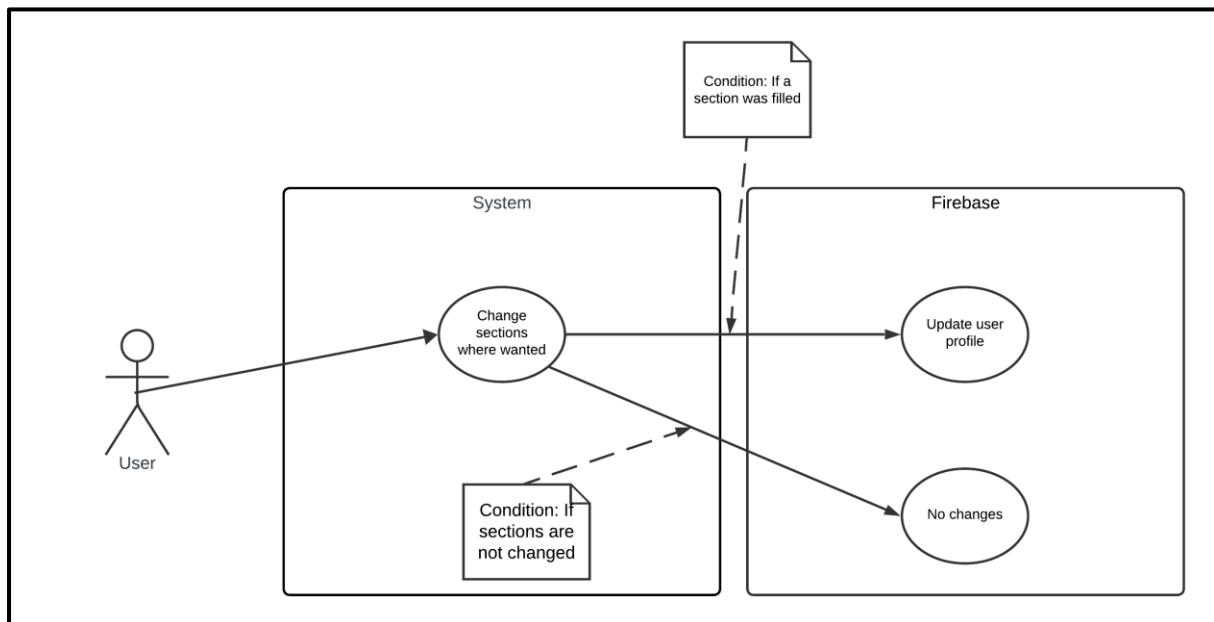
When signing in the User enters their Email and Password. Once this is completed the User then clicks the Sign In button. The Email and Password is then sent to Firebase Authentication which validates if the Email and Password matches existing Email and Password in Firebase. If the Email and Password validates the User is then signed in, else the User is prompted to enter a valid Email and Password. If the User is not a member the user can click the Sign-Up button where the User are navigated to the Sign-Up page.

## Sign Up Use Case



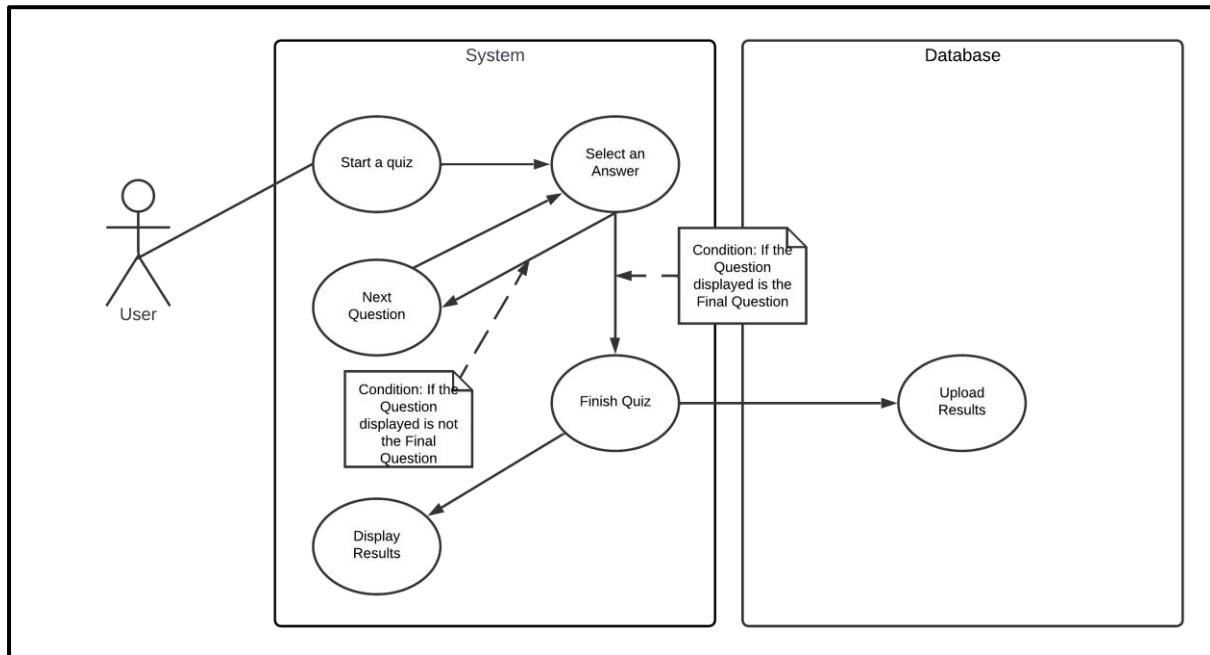
When the User wants to sign up, they need to fill in the registration form, if the form is valid the User gets saved to Firebase and signed in. If the form is not valid the User is then prompted to fill in a valid registration form.

## Edit Profile Use Case



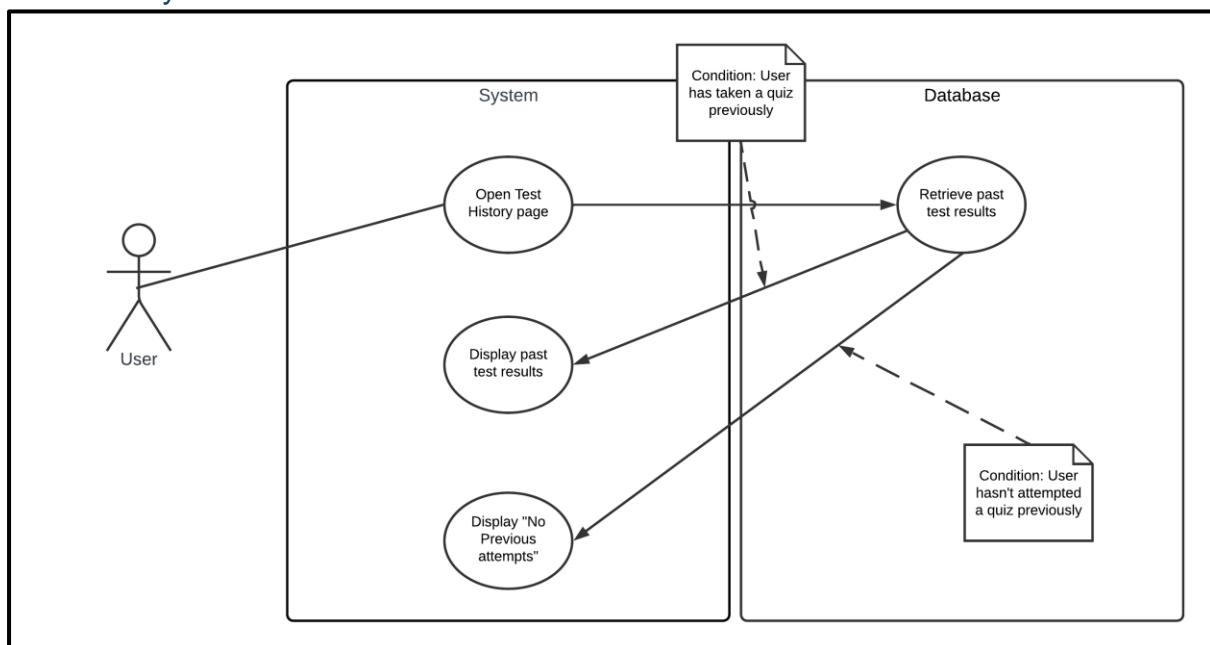
When the User want to update their Profile, the user then needs to navigate to the Profile page, then the User needs to change desired sections. Once the User is happy with the changes, they need to click the Submit button. Once the submit button is clicked the changes are then saved to Firebase. If no changes are made but the submit button is clicked, then no changes are saved.

## Quiz Use Case



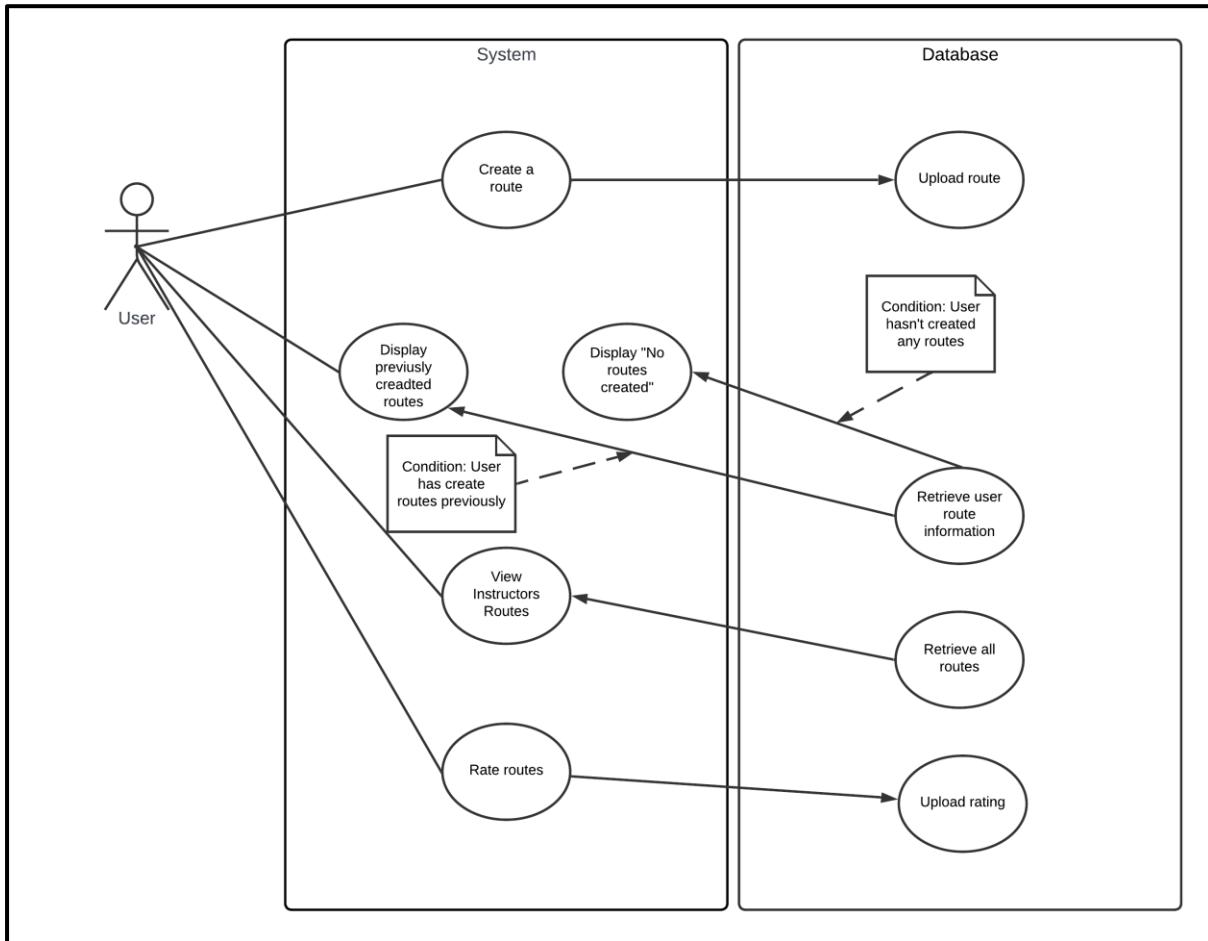
When the User wants to attempt the Quiz, the user then starts the Quiz which display a Question with 4 Answers. The User then selects an Answer which either changes the answer to red or green depending on whether the selected answer is correct or incorrect. The User then clicks the Next button which if the Question displayed is not the Final Question then a new Question and Answers are displayed, else if the Question that is displayed is the Final Question the Next button changes to a Submit button. Once this Submit button is clicked the Quiz Results are then displayed and uploaded to the database.

## Test History Use Case



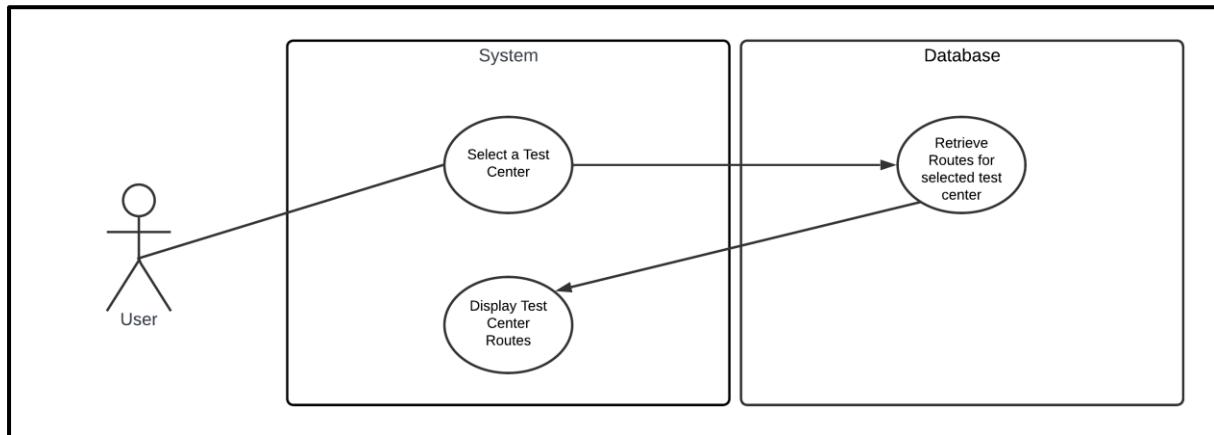
Once the User has navigated to the Theory test page the database will retrieve all the User's past test results and displays the results if the User hasn't completed a Quiz the page displays "No previous attempts".

### Create Route Use Case



When the User creates a route, the route is then uploaded to the database. When the User clicks "Display Routes" button the database then retrieves all the routes the User has created and displays them, if the User hasn't made any routes, then "No routes created" is displayed. When the User clicks Instructor Routes button then the database retrieves all the instructors' routes and displays all routes created by Instructors.

## Test Route Use Case



In the Driving Test page the user then selects a Test Center where the database will retrieve all the predefined routes for the Test Center where then all the set routes for the Test Center is displayed.

## Requirements

### Register

Description: This function allows users to register for the app by providing their personal information. On the main page of the app the user will have to register their information to be able to use the app. This form will prompt the user for the following mandatory information: email, username, and password.

Criticality: This function is essential to the system as the whole idea behind the functionality of the project is to be able to have members or users who feel the need to use the app. Therefore, without this function, the project itself is meaningless. We also feel it is important to have this function as it helps us know what types of users we have and helps improve our app.

Technical issues: The registration form will be designed in React Native and will fit in with the overall layout of the app. The form inputs will be handled using Firebase Authentication, which provides secure authentication and authorization services for your app. Firebase Authentication supports email and password authentication, phone number authentication, and social media authentication such as Google, Facebook, and Twitter. Once completed, this will create an entry for the user in the Firebase Firestore Database. The users table contains a foreign key which links to the user profile table.

Dependencies: This function is not dependent on any other requirements.

### Login

Description: This function allows users to log in to the app using their registered email and password.

Criticality: This function is essential to the system as it enables users to access the app's features. Without this function, users cannot use the app.

Technical issues: The login form will be designed in React Native and will fit in with the overall layout of the app. The form inputs will be handled using Firebase Authentication, which provides secure authentication and authorization services for your app. Firebase Authentication supports email and password authentication, phone number authentication, and social media authentication such as Google, Facebook, and Twitter.

Dependencies: This function is dependent on the Register function.

### **Logout**

Description: This function allows users to log out of the app.

Criticality: This function is essential to the system as it enables users to securely exit the app.

Technical issues: The logout button will be designed in React Native and will fit in with the overall layout of the app. The logout action will be handled using Firebase Authentication, which provides secure authentication and authorization services for your app.

Dependencies: This function is not dependent on any other requirements.

### **Test Centre Selection**

Description: This function allows users to select a test centre where they wish to practice their driving.

Criticality: This function is important to the system as it enables users to choose a test centre that is convenient for them.

Technical issues: The test centre selection page will be designed in React Native and will fit in with the overall layout of the app. The test centre information will be stored in the Firebase Firestore Database.

Dependencies: This function is dependent on the Login function.

### **Test Route Selection**

Description: This function allows users to select a predefined test route or a custom test route that they have created.

Criticality: This function is important to the system as it enables users to practice driving on a specific route.

Technical issues: The test route selection page will be designed in React Native and will fit in with the overall layout of the app. The test route information will be stored in the Firebase Firestore Database.

Dependencies: This function is dependent on the Login function and the Test Centre Selection function.

### **Test Route Creation**

Description: This function allows users to create custom test routes by placing pins on a map.

Criticality: This function is important to the system as it enables users to create custom test routes that suit their needs.

Technical issues: The test route creation page will be designed in React Native and will fit in with the overall layout of the app. The test route information will be stored in the Firebase Firestore Database.

Dependencies: This function is dependent on the Login function.

### **Navigation**

Description: This function allows users to navigate through the selected test route.

Criticality: This function is important to the system as it enables users to practice driving on a specific route.

Technical issues: The navigation page will be designed in React Native and will fit in with the overall layout of the app. The navigation feature will be implemented using the OpenStreetMap API.

Dependencies: This function is dependent on the Login function, Test Centre Selection function, and Test Route Selection function.

### **Theory Questions**

Description: This function allows users to answer theory questions covering topics like road rules, regulations, and road signs.

Criticality: This function is important to the system as it enables users to prepare for the theory test.

Technical issues: The theory questions will be stored in the Firebase Firestore Database. Firebase Analytics will be used to monitor user progress and provide feedback on their responses in a visual graph.

Dependencies: This function is dependent on the Login function.

### **Find Instructor**

Description: This function allows users to find local instructors based on their location. Users can view the details of the instructors such as name, phone number, and address.

Criticality: This function is important to the system as it enables users to find local instructors who can help them prepare for their driving test.

Technical issues: The find instructor page will be designed in React Native and will fit in with the overall layout of the app. The instructor details will be stored in the Firebase Firestore Database.

Dependencies: This function is dependent on the Login function.

## Non-Functional Requirements

### Speed Monitoring

Description: This function allows users to monitor the speed of their vehicle while driving.

Criticality: This function is important to the system as it enables users to monitor their speed and ensure they are driving within the speed limit.

Technical issues: The speed monitoring feature will be implemented using the device's GPS sensor. The speed data will be stored in the Firebase Firestore Database.

Dependencies: This function is dependent on the Login function.

### Database Management

Description: This function allows users to manage the database of the app.

Criticality: This function is important to the system as it enables users to manage the data of the app.

Technical issues: The database management page will be designed in React Native and will fit in with the overall layout of the app. The database management feature will be implemented using Firebase Firestore Database.

Dependencies: This function is dependent on the Login function.

### User Profile Management

Description: This function allows users to manage their profile information such as name, email, and address.

Criticality: This function is important to the system as it enables users to update their profile information.

Technical issues: The user profile page will be designed in React Native and will fit in with the overall layout of the app. The user profile information will be stored in the Firebase Firestore Database.

Dependencies: This function is dependent on the Login function.

## Error Reporting

### Sign In:

- If no email was entered or the email that was entered is wrong the error message displays and alert of – “Error auth/invalid-email”.
- If the email is valid but no password was entered the error message display an alert of – “Error auth/missing-password”.
- If a valid email is entered but given the wrong password the error message displays an alert saying – “Error auth/invalid-credentials”.

## Sign Up:

- If no email was entered or the email that was entered is wrong the error message displays and alert of – “Error auth/invalid-email”.
- If the email is valid but no password was entered the error message display an alert of – “Error auth/missing-password”.
- If a valid email is entered but given the wrong password the error message displays an alert saying – “Error auth/invalid-credentials”.

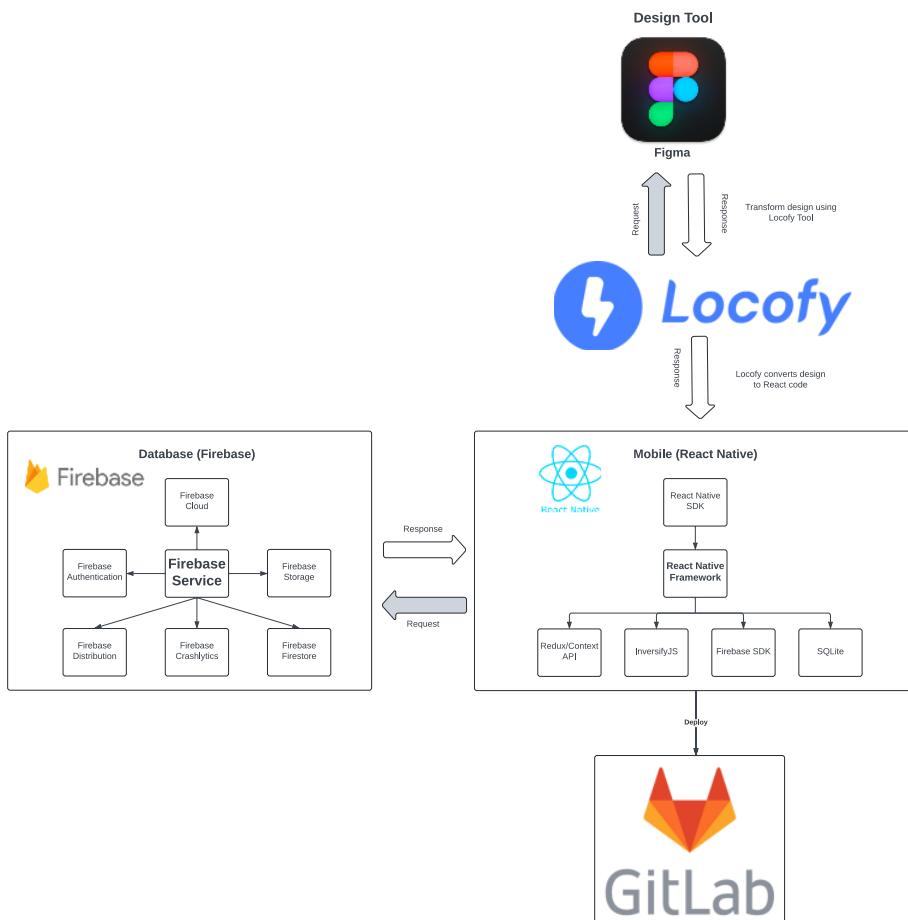
## Test History:

- If there are no attempts the page displays “No previous attempts”

## View Routes:

- If there are no previous routes created the page displays “No routes created”

# Current Software architecture for RoadReady App



## Design and Development Process

- UI/UX Design: We created a user interface that is both aesthetically pleasing and effective by using Figma. Our design approach was focused on developing an intuitive user experience that would enable users to navigate and learn without difficulty.
- UI to Code: We were able to quickly convert our UI designs into React Native code using the Locofy AI plugin for Figma, which sped up development and guaranteed consistency between the final product and the design.

## Feature Integration

Backend (Firebase): Our backend service, Firebase, offers a scalable database for storing theory test questions, user data and history of user submissions. Our users will always have access to the most recent content thanks to its real-time database feature, which enables automatic updates and retrieval of data.

Feature Integration (Mapbox): To improve learner drivers' hands-on driving experience, we plan to incorporate real-time navigation and interactive maps in the future using Mapbox API. Route Selection for Practice: In order to better prepare students for driving situations they may encounter in the real world we are working on a feature that will let them choose and practice particular driving routes.

## Version Control and Collaboration

GitLab: GitLab is our version control system, and our project is linked to it. It enables us to keep track of every modification, work together as a team effectively, and preserve a record of our development process.

## Security and Data Privacy

Authentication and Authorization: To protect private data and personal information, we use strong security measures, such as user authentication and authorization.

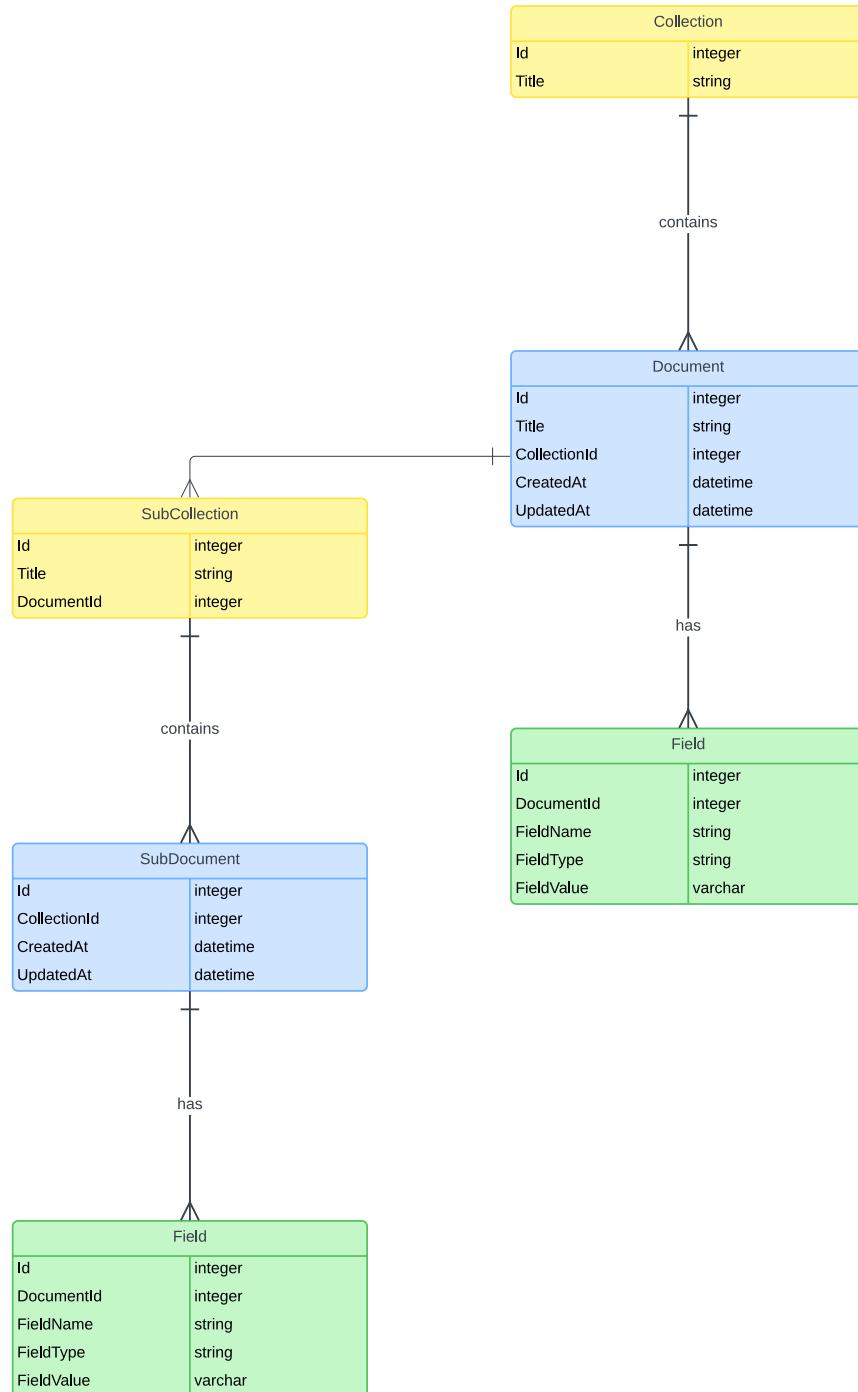
Data Encryption: In accordance with industry-standards, all sensitive data is encrypted.

## Maintainability and Scalability

Cloud Services: Firebase can scale its user base without sacrificing performance thanks to its highly scalable cloud infrastructure.

Continuous Integration/Deployment (CI/CD): We use CI/CD pipelines to automate deployment and testing, making sure our app is always up to date.

# Logical Database Design and data storage requirements, with careful consideration of all data.



Collection: Has an id as an integer with a Title as a string. Collection is made up of Documents.

Document: Document has an id as an integer, a Title as a string, CollectionId as an integer, a CreatedAt and UpdatedAt as a datetime. Documents is made up of SubCollections, and Fields.

Fields: Fields has an id as an integer, DocumentId as an integer, FieldName as a string, FieldType as a string, andFieldValue as a varchar.

Sub-Collection: Sub-Collection has a id as an integer, Title as a string and a DocumentId as an integer. Sub-Collection is made of Documents.

## Zachmann Framework

### Owner's Point of View

What?

#### Business Entities

- Learner Drivers: The primary users of our app, who are preparing for their driving theory and practical tests.
- Driving Instructors: A secondary user base that may use the app to monitor student progress and augment their instruction.
- Theory Test Questions: An extensive collection of questions covering rules, regulations, and road signs relating to traffic.
- Educational Content: The app contains resources and study materials to help with learning.
- Mock Exams: Exams that are similar to the structure of actual theory test.
- User performance data is information from practice tests and mock exams that is used to track a user's progress and create individualized learning plans.

#### Informational Assets

- Test Result Analytics: Tools for data analysis that assess user performance and offer suggestions for development.
- Navigation and Route Data: (To be) Interactive maps and real-time navigation for realistic driving practice.
- User Accounts: Details about user profiles, subscription status, and registration.

How?

### Operations and Business Processes

#### 1) User Registration and Onboarding:

- New users sign up the app and fill out the required fields.
- Password setup and email verification are required during account creation.

#### 2) Theory Test Practice:

- Users get access to topic-based theory questions.

- To strengthen their understanding, they start practicing answering to questions.

**3) Mock Theory Tests:**

- In order to replicate the real exam, users take timed mock theory tests.
- For analysis, the results are recorded.

**4) Delivery of Educational Content:**

- Users are shown study materials (such as rules and traffic signs) by linking them back to RSA's website.

**5) User Performance Tracking:**

- Test results and practice sessions are recorded by the app for users.
- Analytics identifies areas in need of improvement.

## Where?

### **Geographical Distribution**

- Service Availability: Users in Ireland can access the driving test and practical content.
- User Locations: Users are able to use the app remotely from any location within the serviceable regions.

### **Physical Locations**

- Office: RoadReady's headquarters will be in Dublin, Swords, and it act as the main hub for company development and operations.

### **Resource Distribution Database**

- Database: To ensure scalability and real-time data syncing, Firebase is used as the cloud-based database to store user data, theory test questions, and other app data.
- Computing Resources: In order to maintain its functionality, the app makes use of cloud computing resources, which enables effective scaling as the user base expands.

### **Network Topology**

- Connectivity: The app's backend is hosted on Firebase's secure servers, and users use their personal devices to connect to "RoadReady" services via the internet.
- Security: To safeguard user privacy and data transmission, strong security measures are put in place. These include data encryption and secure authentication.

## Who?

### **Roles and Responsibilities**

**1) Learner Drivers (Users):**

- The main app users.
- responsible for reviewing material, taking practice theory questions, mock tests and tracking their progress.

Intend to learn and get ready for your driving exam.

2) Parents/Guardians:

- Is to oversee beginner drivers during practice sessions.
- track the time spent driving under supervision, during practice.
- Track progression and offer advice.

3) Driving instructors (secondary users):

- May use the app to improve their teaching.
- To customize instruction, they may access user performance data.

## User Profiles

### Learners

- Created during app registration.
- Includes personal details like name and email as well as progress records
- Linked to driving practice history

## Support and Feedback

### Customer Support

- Provide assistance for issues relating with our app e.g. troubleshooting, account management and bugs.
- Respond to user queries and provide feedback

## When?

### **Learner Permit Phase**

When learners are preparing for their driving theory test, they may want to use RoadReady or other relevant apps to practice.

### **Full license phase**

When learners have passed their theory test but would now like to prepare for their practical driving test either by using “create your own routes” or practicing theory questions.

### **Ongoing Usage**

Users continue to use the app daily as a process to learn until they are ready for practical/theory test.

## Why?

### **Safety and Competence**

Primary goal is to ensure the road safety by ensuring that learner drivers are well-prepared and knowledgeable.

### **Compliance with Rules and Regulations**

The app helps learners aware of rules and regulations through practice questions.

## User Empowerment

The app empowers learners by proving educational content, practice tests and progression history.

## Technical Designer's Point of View

What?

### Data Model

#### User Data Entities:

- attributes of user profiles, such as personal data, and progress.
- Relationships between users and their subscription information and test results.

#### Performance Analytics Entities:

- Data schema for recording user answers, time, and test scores on mock and practice tests.

### Data Relationships

#### User-Content Interaction:

- Associations between users and the features they access.
- Tracking of how users engage with the app in order to tailor the education.

#### Data for Subscriptions:

- Explanation of membership plans and their features.
- Connections between user accounts and the status of their active subscriptions.

### Data Integrity and Consistency

#### Rules for Validation:

- regulations and guidelines that guarantee the validity and accuracy of data throughout the system.
- techniques, like data type enforcement and data consistency, for preserving data integrity.

#### Data Security:

- Sensitive data fields are encrypted.
- Policies for access control that specify who can access or alter data.

### Data Storage and Retrieval

#### Firebase Database:

- Firebase NoSQL database for storing and retrieving data efficiently
- Ability to synchronise in real-time that reflect changes instantly across devices

How?

### Software Architecture (see above)

## **Data Flow and Processing**

### 1) Theory Test Questions:

- Questions retrieved from Firebase.
- User Responses are recorded and analysed for feedback.

### 2) Mock Theory Test:

- Timed exams simulate the actual theory test format.
- Results are stored and used for progress tracking.

## **Where?**

## **Geographical Distribution**

### Server infrastructure:

- App's backend are hosted on cloud servers e.g. Firebase datacentres
- These datacentres may be located in various regions around the world.

## **Network Topology**

### Internet Connectivity:

- Users connect to the app using their internet
- Secure communication protocols (HTTPS) to ensure data privacy

## **Security Measures**

- Sensitive data (user profiles, test results) are encrypted
- Compliant with industry standards e.g. TLS/SSL

## **Who?**

## **System Actors and Roles**

### End Users (Learner Drivers):

- Interact with the app's UI to access study materials, practice questions, and take mock exams.
- Provide feedback on the app's usability and content quality.

### Administrators:

- Manage the app's content, including updating the question bank and educational materials.
- Monitor app performance and user engagement metrics.

### Developers:

- Implement new features and maintain existing ones.
- Address bugs and performance issues.

## **Interactions with the System**

### User Authentication:

- Users must authenticate to access personalized content and track their progress.
- Authentication is managed through secure login processes.

### Content Access:

- Users interact with the system to access different types of content based on their subscription level.

- The system controls access to premium content for subscribed users.

## Security Mechanisms

### Access Control:

- Role-based access control mechanisms ensure users can only access features and data appropriate to their role.
- Administrators have higher-level access to manage the system.

### Data Protection:

- Encryption and secure data storage practices protect sensitive user data.
- Regular security audits ensure the system's integrity.

## When?

(same as owner's POV) and:

## Scheduled Processes

### Data Synchronization:

- Regular synchronisation with Firebase to ensure real-time data updates.
- Scheduled intervals for refreshing content and user profiles.

### Notifications and Reminders:

- Timely notifications for practice sessions, mock tests, and study materials.

## Why?

## System Requirements and Constraints

Scalability: So the app can handle a growing number of users without the loss in performance.

Maintainability: The design choices must ensure that the app is easy to update and maintain.

Security: Protecting user data and ensuring privacy is a mandatory requirement

## Design Goals

- User Experience: Providing a seamless and intuitive user interface that enhances learning and engagement.
- Performance: Ensuring the app is responsive and efficient, with minimal load times and smooth interactions.
- Reliability: The app must be reliable, with minimal downtime and accurate content delivery.

## Technical Rationale

- Choice of React Native: Selected for its cross-platform capabilities allowing it to be used for both iOS and Android.
- Use of Firebase: Chosen for its real-time database features, scalability, and ease of integration with React Native.
- Modular Architecture: Adopted to facilitate easier updates, feature additions, and maintenance.

## **Alignment with Business Objectives**

- Supporting Educational Goals: The technical architecture supports the app's mission to provide driving test preparation.

## **Discussion of external software interfaces**

### **Figma**

For designing the UI for RoadReady we chose Figma, a powerful and collaborative design tool. In the brainstorming part of our journey, we discussed the main features and characteristics of RoadReady. Our vision was for an app that would transform the way new drivers learn by offering a detailed structure for both theoretical and practical driving test preparation. We used Figma to convert this idea into a workable design.

We took advantage of one of Figma's most important features, which was its collaborative environment. Our team collaborated on a shared file. This way we were able to quickly iterate and get instant feedback from one another thanks to its real-time collaboration.

We were able to create a responsive design that adjusts to different screen sizes and orientations thanks to Figma's flexible layout and frame system. To make sure our app would provide a consistent user experience on a variety of devices, we carefully designed every frame. Constraints and auto-layout tools also made sure our design was flexible and could fit into various display settings.

Our static designs were brought to life through Figma prototyping. We developed interactive prototypes that recreated the user flows, transitions, and animations of the real app. Early in the design process, we were able to identify usability issues and take proactive steps to address them as a result.

We also made it a convention to create a collection of re-usable buttons, fonts and navigational elements. These were made to be components. This as a result sped up the design process and made it easier to maintain the app's consistent look and feel.

Finally, we made sure that the app was accessible for most users by testing font sizes, element spacing, and colour contrasts. (see appendix for screenshots)

### **Locofy AI**

Our next step included transitioning from design to development phase. This procedure was very much accelerated for our app by the means of Locofy AI plugin, a cutting-edge tool currently in its beta phase that converts Figma designs into React Native code. (see appendix for where/what Locofy can be used with).

We started off with Locofy Ai by first tagging UI elements in our Figma design. We were able to assign particular functionalities to design components by a simple click of a button. We tagged elements/components such as our start screen, drawer menu, input fields, buttons and images. Not only that but we could also add actions to them so for instance if clicking

on a button, we could make it change page a particular page. As well as testing in Locofy's own builder prototype, we also tested the UI on our own phones to make sure that buttons behaved as we intended it to.

The next step was to export our design to code once the navigation had been set up and the tagging of all elements. Locofy AI amazed us by producing React Native code that was directly usable in our development environment (VScode) and was clear, readable, and maintainable.

After implementing firebase to the code and fixing a few things, we focused on deploying the generated code to our GitLab repository. (see appendix for screenshots)

## Performance Requirements for RoadReady App

### Loading time

- First Load Time: On a typical mobile data connection, the app shall load in 2 seconds.
- Content Load Time: Content shall load within 500 milliseconds after user interaction for dynamic content, such as theory questions and practice exams.

### Devices and Operating Systems

- Compatibility: The application will work with the most recent releases of both Android and iOS.
- Optimization: To reach a broad user base we shall make sure the app is optimized for both high-end and low-end devices.

### Screen Resolution

- Adaptive Design: To ensure readability and usability on all devices, the UI will adjust to different screen resolutions.
- Graphics Quality: Performance and load times will not be sacrificed when using high-resolution graphics.

### Crash Reports

- Crash rate: Aim to keep the crash rate of each session under 0.1%.
- Recovery: To recover from crashes, we will develop a mechanism which preserves user data and last state.

### Scalability

- User load scalability: Our application must be able to support at least 10,000 simultaneous users without experiencing any performance issues.
- Data Growth: We plan the database to effectively handle an annual 20% growth rate in the volume of data.

### Security

- Data encryption: precaution should be taken for both in-transit and at-rest data.
- Authentication: To stop unwanted access, we aim to use strong authentication procedures.

## **Future Proofing**

- Technology Updates: We must make sure that, with very little rework, the application can accept updates to hardware and operating systems.
- Feature Expansion: we ensure to create an architecture that makes it simple to incorporate new features and services.

## **Additional Considerations**

- Network Conditions: We will evaluate and improve the app's performance in 3G, 4G, and Wi-Fi networks, among others.
- Battery Usage: We will keep an eye on and adjust the app's usage to make sure it doesn't use up too much of the device's battery life.
- Memory Usage: Our application must use memory wisely in order to prevent memory leaks and maintain seamless functioning on devices with restricted RAM.
- A working prototype software with appropriate considerations of the user interface, to be demonstrated at the team interview.

## **Technical challenges to be solved in bringing this project to market**

Our team encountered a number of challenges while creating the RoadReady app, which put our technical expertise and problem-solving skills to the test. Although we were not able to overcome the following challenges, we plan to overcome them before releasing it to the market. The special emphasis is on the turn-by-turn navigation feature that we want to add after submission.

### **Mapbox API**

Our idea was to differentiate ourselves with a feature that would use the Mapbox API to provide turn-by-turn navigation. The purpose of this feature was to give new drivers a realistic and engaging environment in which to recite their driving routes. But incorporating a feature this complicated comes with its own set of difficulties.

Mapbox API integration into our app presented a variety of difficulties. First off, our access to some premium features of the API—which were essential for a perfect navigation experience—was restricted by budgetary limitations. Second, our strict project deadlines clashed with the time needed to understand and use this complex API. It was not feasible to develop this feature in the allotted time frame while trying to balance other crucial app features and academic responsibilities.

Furthermore, we lacked the technical knowledge to incorporate more sophisticated features like personalized route building and real-time navigation updates. We realized that in order to deliver a feature that lived up to our exact standards for user experience, we would have to dedicate a good chunk of time for research and development, which was not practical alongside other college work.

Our Plan for Implementation Leading up to Market Release is to have the turn-by-turn navigation feature in RoadReady despite the obstacles. Our approach consists of:

- 1) Acquiring Extra Funding: To pay for the integration of the Mapbox API's high - end features, we intend to investigate a number of funding sources, such as grants, collaborations, and crowdfunding.
- 2) Dedicated Development Time: Following submission, we will set aside focused development cycles just for the Mapbox API integration, making sure that we can focus on this feature because our schedule would not be so busy.
- 3) Technical Skill Improvement: To acquire the skills required to work with the Mapbox API, we will focus on learning it. This means attending workshops, online classes, and practical training if MapBox provides them.

## Firebase Integration

We managed to succeed in putting basic advanced capabilities like data storage and user authentication into place, but we were unable to fully understand the features like cloud computing and predictive analytics.

Looking Forward we're aiming to utilise Firebase to its fullest potential by the means of:

Continued Learning: To make sure that every team member is well-versed in Firebase, we will devote time to grasping the entire range of services offered by the platform.

Continuous Integration: After the project is submitted, we will gradually incorporate more Firebase features to improve the app's usability and functionality.

## Highlighted Code

### Login Function

```
const handleLogin = () => {
  signInWithEmailAndPassword(auth, email, password)
    .then(userCredentials => {
      const user = userCredentials.user;
      console.log('Logged in with:', user.email);
      navigation.navigate('HomePage')
    })
    .catch(error => alert(error.message))
}
```

```
import { auth } from '../firebaseConfig'
import { signInWithEmailAndPassword } from "firebase/auth"
```

```
const [email, setEmail] = useState('')
const [password, setPassword] = useState('')
```

```
import { useNavigation } from "@react-navigation/native";
```

Once the function is run an imported Firebase function “signInWithEmailAndPassword” is then run taking 3 arguments auth which is the Firebase Authentication established in the firebaseConfig file, email which is the text entered into the email input box which is saved using the React useState Hook, and Password which is the text entered into the password input box which is also saved using Reacts useState Hook. Then a constant variable named user is saved taking user from userCredentials, next the console logs “Logged in with:” and the email of the user. Lastly using useNaviagtion from react-navigation/native to navigate to the Homepage. If an error is caught then an alert is displayed with the message of the error.

## SignUp Function

```
const handleSignUp = () => {
  createUserWithEmailAndPassword(auth, email, password)
    .then(userCredentials => {
      const user = userCredentials.user;
      setDoc(doc(db, "user", email), {
        email: email, name: username
      });
      console.log('Registered with:', user.email);
      console.log(userCredentials)
      updateProfile(user, {
        displayName: username
      })
    })
    .catch(error => alert(error.message))
}
```

```
import { auth, db } from '../firebaseConfig'
```

```
import { createUserWithEmailAndPassword, updateProfile } from "firebase/auth"
```

```
import { doc, setDoc } from "firebase/firestore";
```

Once the SignUp function is run an imported Firebase function “createUserWithEmailAndPassword” is then run taking 3 arguments auth which is the Firebase Authentication established in the firebaseConfig file, email which is the text entered into the email input box which is saved using the React useState Hook, and Password which is the text entered into the password input box which is also saved using Reacts useState Hook. Then a constant variable named user is saved taking user from userCredentials, next an imported Firebase function “setDoc” takes a “doc” function with 3 arguments db which is the database established in the firebaseConfig, the string “user”, and the email variable with setting “email” to the email variable and “name” as the username variable. This creates a Document in the “user” Collection with the Fields “email” and “name”.

```
useEffect(() => {
```

```

console.log(count >= (categories.length))
if(count >= (categories.length)) {
    const score = cat1.length + cat2.length + cat3.length + cat4.length +
cat5.length
    console.log(score)
    setDoc(doc(db, "Quiz", auth.currentUser.email, "attempts",
String(docs)),{result: ((score) > (count / 1.33) ? "Pass": "Fail"), score:
(String(score) + "/" + (String(count))))}
}
}, [count])

```

The useEffect is a React Hook which runs whenever the page is loaded, because of the constrictor at the end with the variable count it is re-run whenever the variable count changes. The useEffect starts off with logging the Boolean (if count is greater or equal to the length of the variable categories. Then an if statement is run with the condition of the same Boolean, then a constant variable is declared called score with the lengths of the variables cat1 to cat5, the score is logged and using “setDoc” a function imported from Firebase it creates a subcollection inside the Document “attempts” and named using the variable “docs” turned into a String, and creates the Fields “results” and “score” where result uses a condition that if the score variable is greater than 75% of the count the result field is set to “Pass” or if not it is set to “Fail”, and score is set to the string of the variable score and the string of the variable count.

```

<Pressable onPress={() => setSelect(a1)} style={ (ans == select && select ==
a1) ? [styles.aParent, styles.parentFlexBoxCorrect] : (select == a1) ?
[styles.aParent, styles.parentFlexBoxSelect] : [styles.aParent,
styles.parentFlexBox]}>

```

Once the Pressable is pressed the select variable is set using a useState React Hook called setSelect as the variable a1. Then using conditional styling the pressable changes styles based on if the ans variable is the same as the select variable and select is the same as the a1 variable, then the style changes if only select is the same as the variable a1, and lastly if none of these conditions are met the pressable displays a different style. Based on the different styles if the first condition is met the pressable background changes to green, if the second condition is met the background changes to red, and if neither condition is met the background stays as grey.

## Interface rationale

We followed the design techniques from “UI design and Implementation” module:

- 1. Be Consistent**
  - We ensured that UI elements like buttons, fonts, and colour styles were consistent across all screens. This consistency helps users quickly become familiar with the app’s interface, reducing the learning curve and increasing usability.
- 2. Simple and Natural Dialogue**

- We concentrated on delivering content with the least amount of user effort by keeping a high information-to-administration ratio. Sharpening, grouping, layout, font selection, and colour were among the graphic design elements that were carefully chosen to create a natural flow, which made the user interface of the app simple to use.

### 3. Speak the User's Language

- The app was written with learner drivers in mind, by using metaphors and clear, user-oriented messaging. This strategy avoided using technical jargon that can confuse users and made the app's content and instructions relatable and simple to understand.

### 4. Provide Informative Feedback

- Quick, educational feedback was provided for each user action. Users were made aware of the results of their interactions through the app's clear responses, which included notifications of progress and results of completed quizzes.

### 5. Reduce User's Memory Load

- The application is created to minimise the cognitive load on users. Users don't have to remember information from one area of the app to another because they have two options for navigation one from the drawer menu and the other from the bottom menu. It is self-explanatory.

### 6. Provide Shortcuts for Frequent Use

- For users, we implemented shortcuts. For example, if the user wants to sign out, they can simply toggle the menu and sign out from there instead of having to go to the profile page first.

### 7. Good Error Messages

- Error messages are written in a clear, concise, and helpful manner for example during sign in, if the user types in an incorrect password, they get a popup saying invalid email/pass.

### 8. Prevent User-Driven Errors

- a. We anticipate potential user errors by including confirming actions that could have significant consequences e.g. during quiz if they decide to quit they are prompted with the confirmation pop-up.

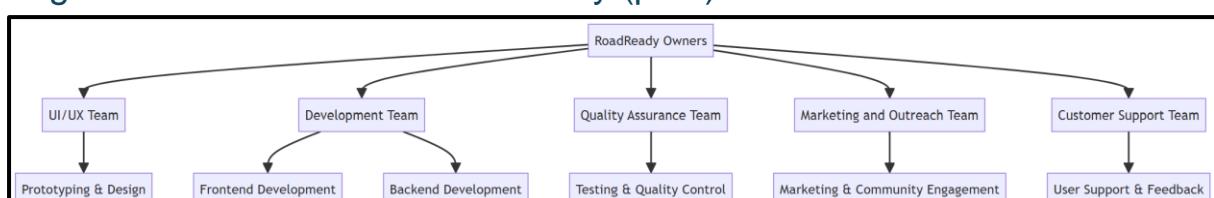
### 9. Provide Easy Reversal of Action

- a. Users could easily undo actions without penalty, which encourages exploration and interaction e.g. in the practice tests, where users might change their answers before final submission.

(see appendix for UI designs)

## Appendix

### Organisational Chart for RoadReady (plan)



## Team CV for RoadReady

### Summary

A highly skilled and dynamic team with extensive knowledge in data analytics, business analysis, quality assurance, and software development. We bring a wealth of industry knowledge and technical expertise to the table, having worked for reputed companies like General Motors and AIG during our internships. The result of our combined efforts is the app, RoadReady, a feature-rich tool made to help learner drivers.

### Core Competencies

**Software Development & Quality Assurance:** Matthew's proficiency in full-stack development and quality assurance testing ensured robust and reliable app performance.

**Data & Business Analyst:** Arvind's strong analytical and data driven skills ensured understanding user requirements and translating them into the app's design and functionality.

### Technical Skills

**Design Tools:** For UI/UX design, we used Figma to create an easy-to-use interface for RoadReady.

**Code Conversion:** To bridge the gap between design and development, Locofy.ai was used to convert Figma designs into React Native code in an effortless manner.

**Code Editing:** Improved the quality and maintainability of code by using Visual Studio Code (VSCode) for code development and debugging.

**Database Integration:** Firebase was integrated to offer backend support, authentication services, and real-time database functionality.

**Deployment:** To ensure effective workflow and timely updates, GitLab was used for version control and continuous integration/continuous deployment (CI/CD).

### Professional Experience

**Software Developer & QA Tester:** At General Motors, Matthew acquired hands on experience in software development and testing, which helped to produce high-quality software solutions.

**Business Analyst & Data Analyst:** At AIG, Arvind created essential business insights and tools for data visualization that improved decision-making and business procedures.

### Key Achievements

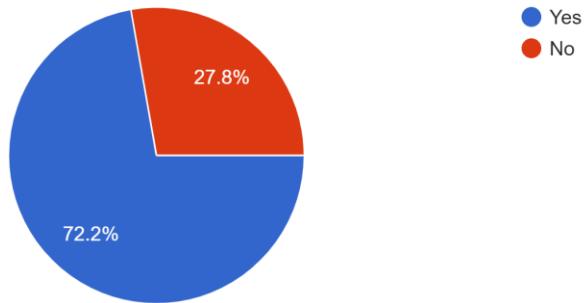
**Innovative Design:** Designed RoadReady with a cutting edge design that makes it an extremely effective and engaging learning platform for users.

**Effective Development:** Time-to-market was greatly shortened by integrating contemporary tools like Locofy and Figma into the app development process, which streamlined the process.

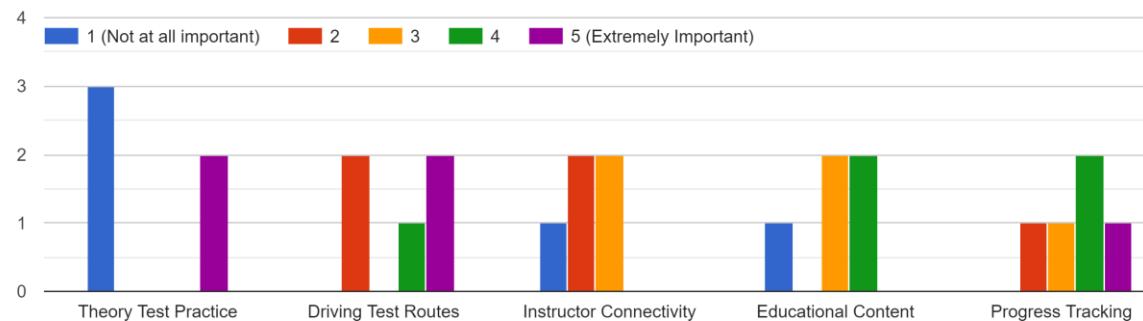
## Primary Research Survey

Do you hold a current Learners Permit or Drivers License?

18 responses

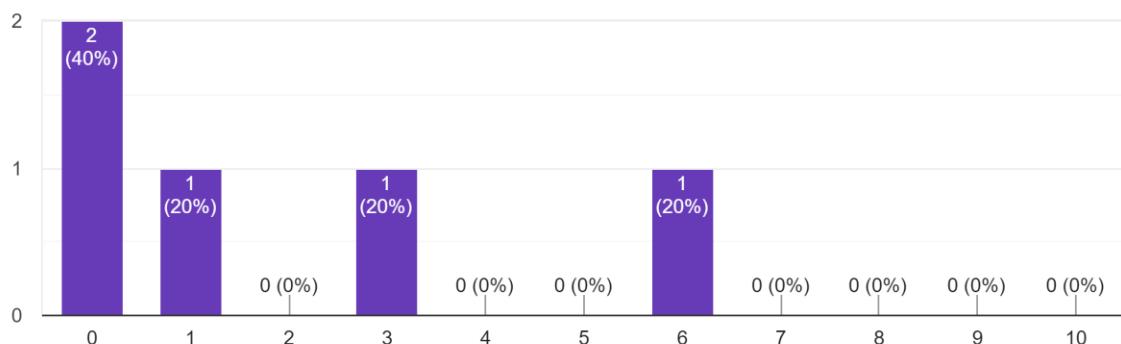


Which features would you prioritize in a driving test preparation app? (Rank in order of importance)



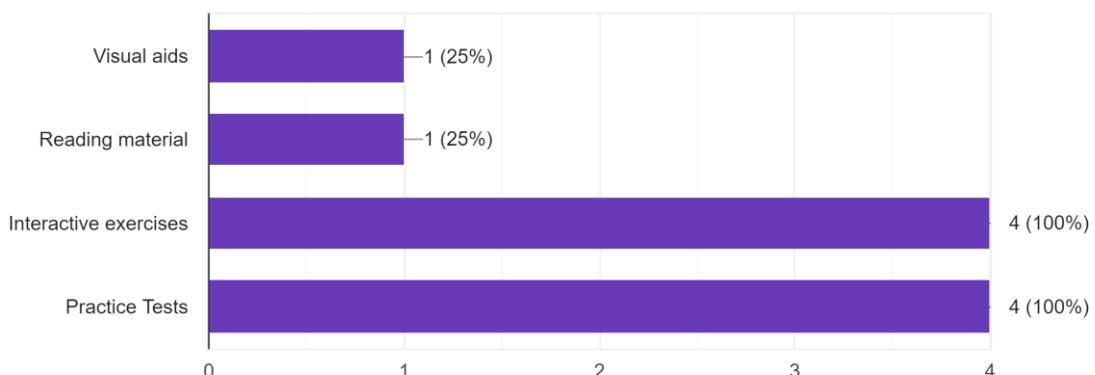
What is the maximum amount you would be willing to pay for a comprehensive driving test preparation app (monthly subscription)?

5 responses



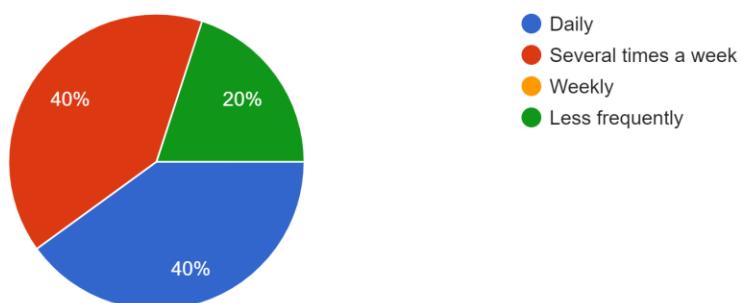
How do you prefer to learn and practice for tests?

4 responses



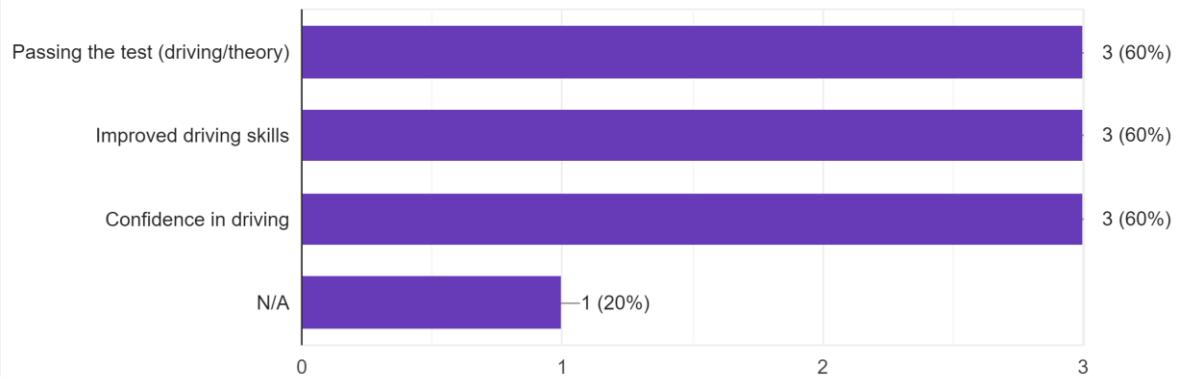
How often would you use a driving test preparation app?

5 responses



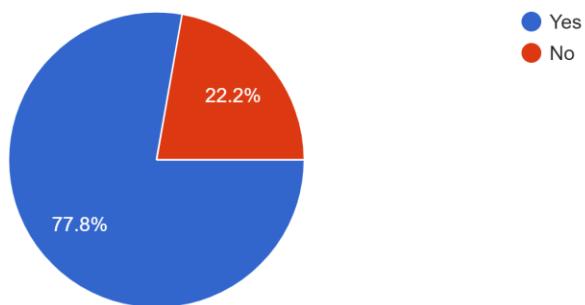
### How would you measure the success of a driving test preparation app?

5 responses

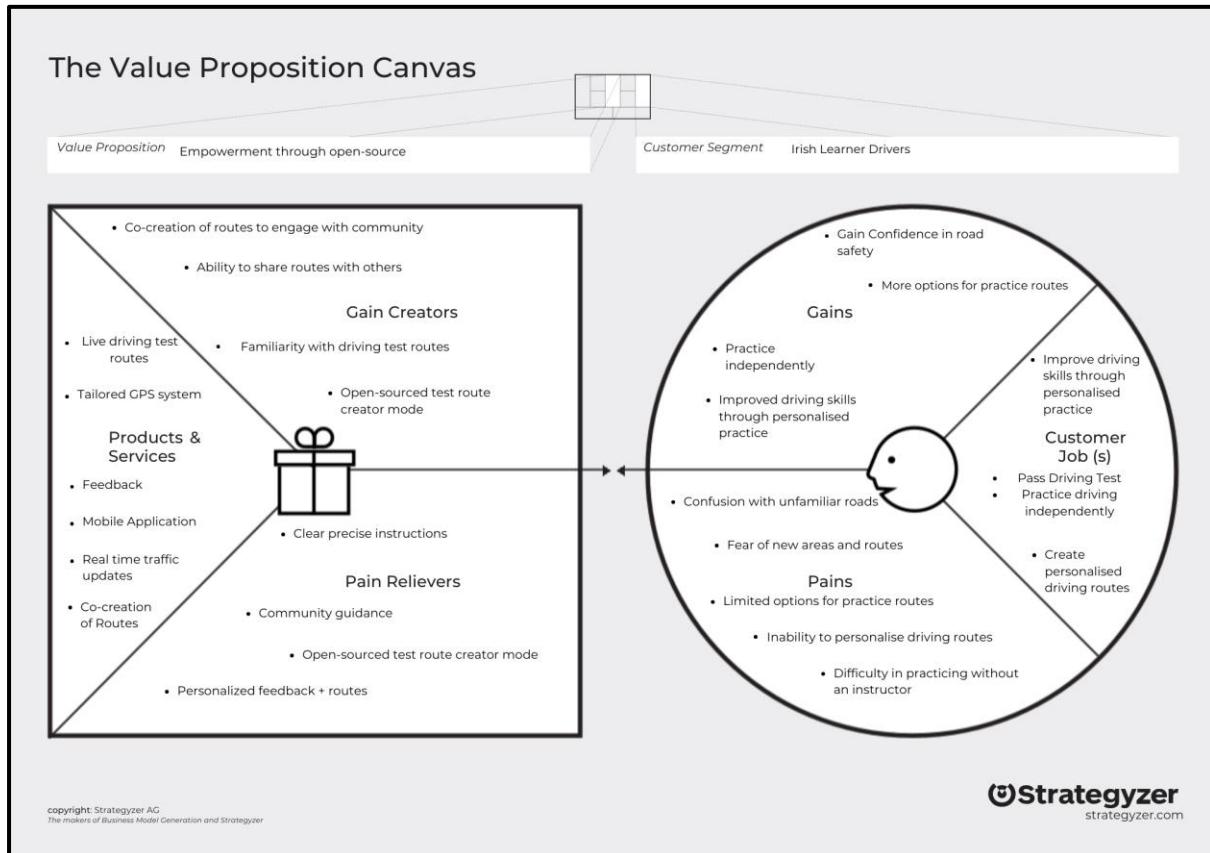
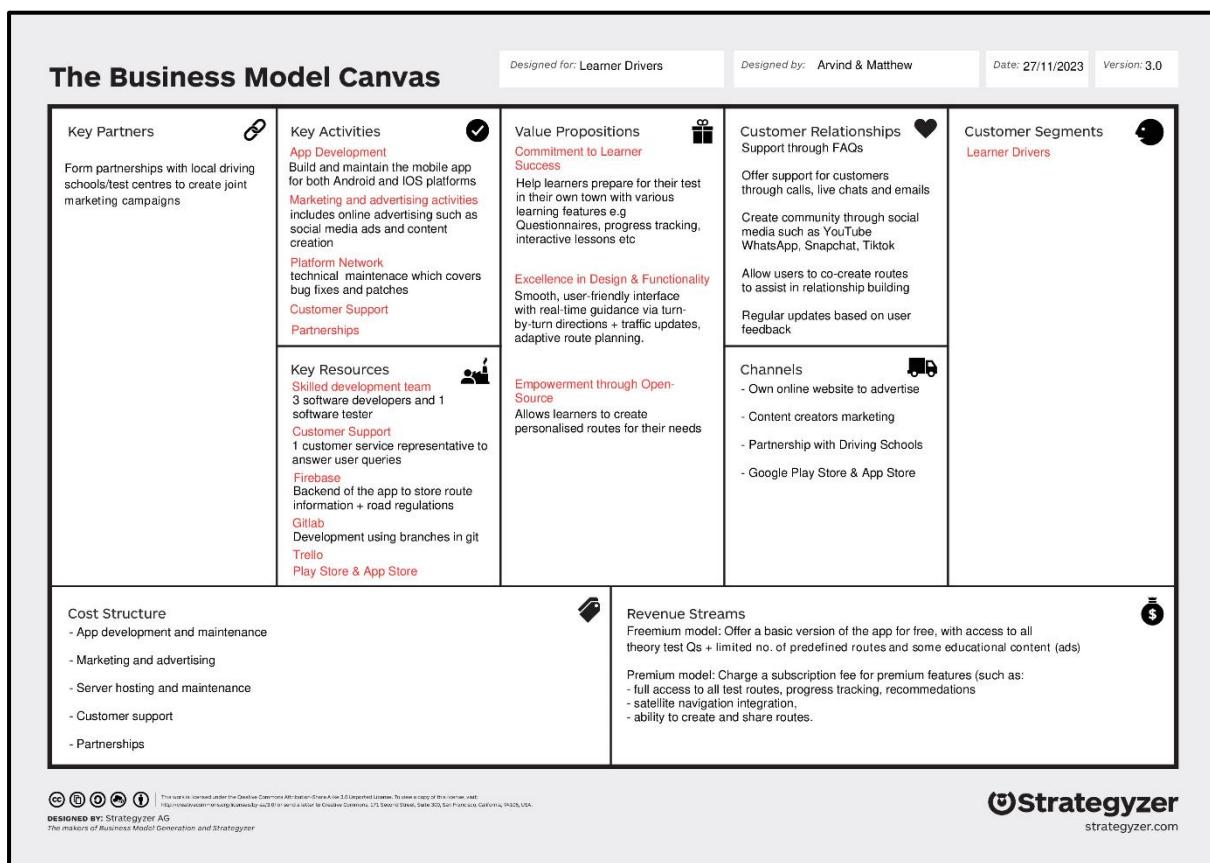


### Would you use an app to practice for the Theory Test, Driving Test or both?

18 responses



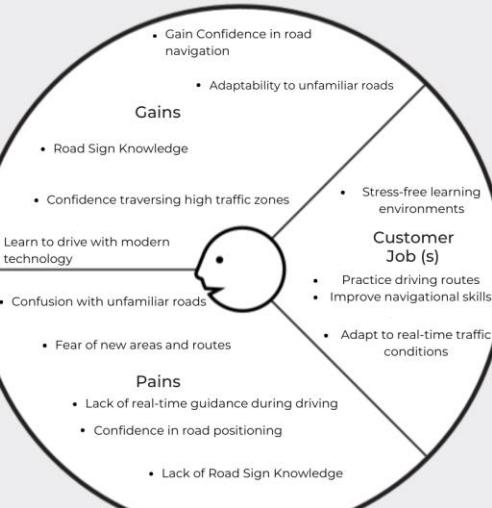
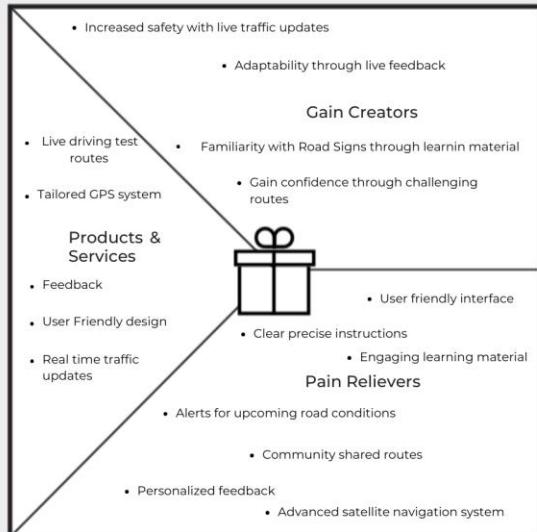
# Business Model Canvas (BMC) and Value Propositions Canvas (VPCs)



## The Value Proposition Canvas

Value Proposition Excellence in Design & Functionality

Customer Segment Irish Learner Drivers



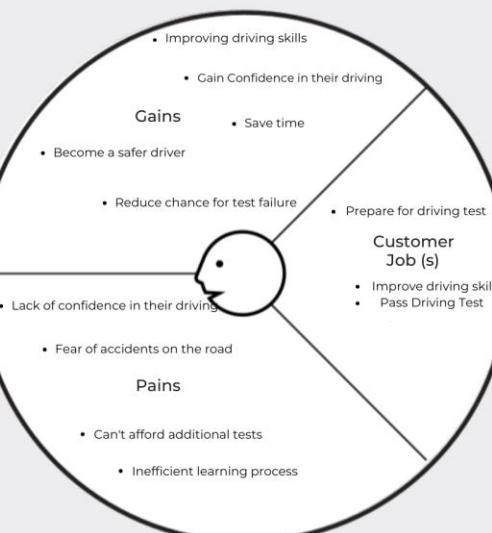
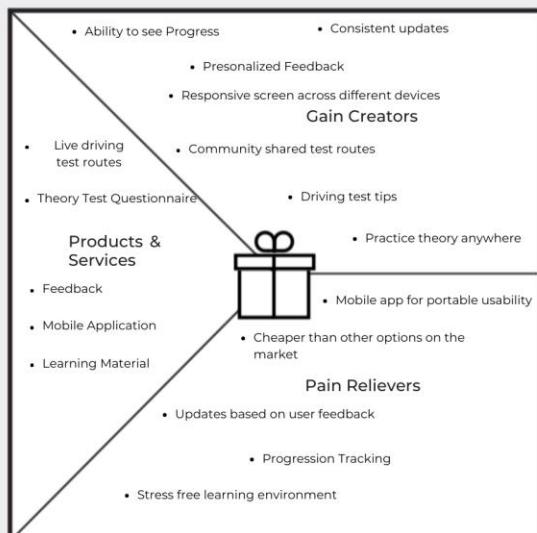
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Strategyzer  
strategyzer.com

## The Value Proposition Canvas

Value Proposition Commitment to Learner Success

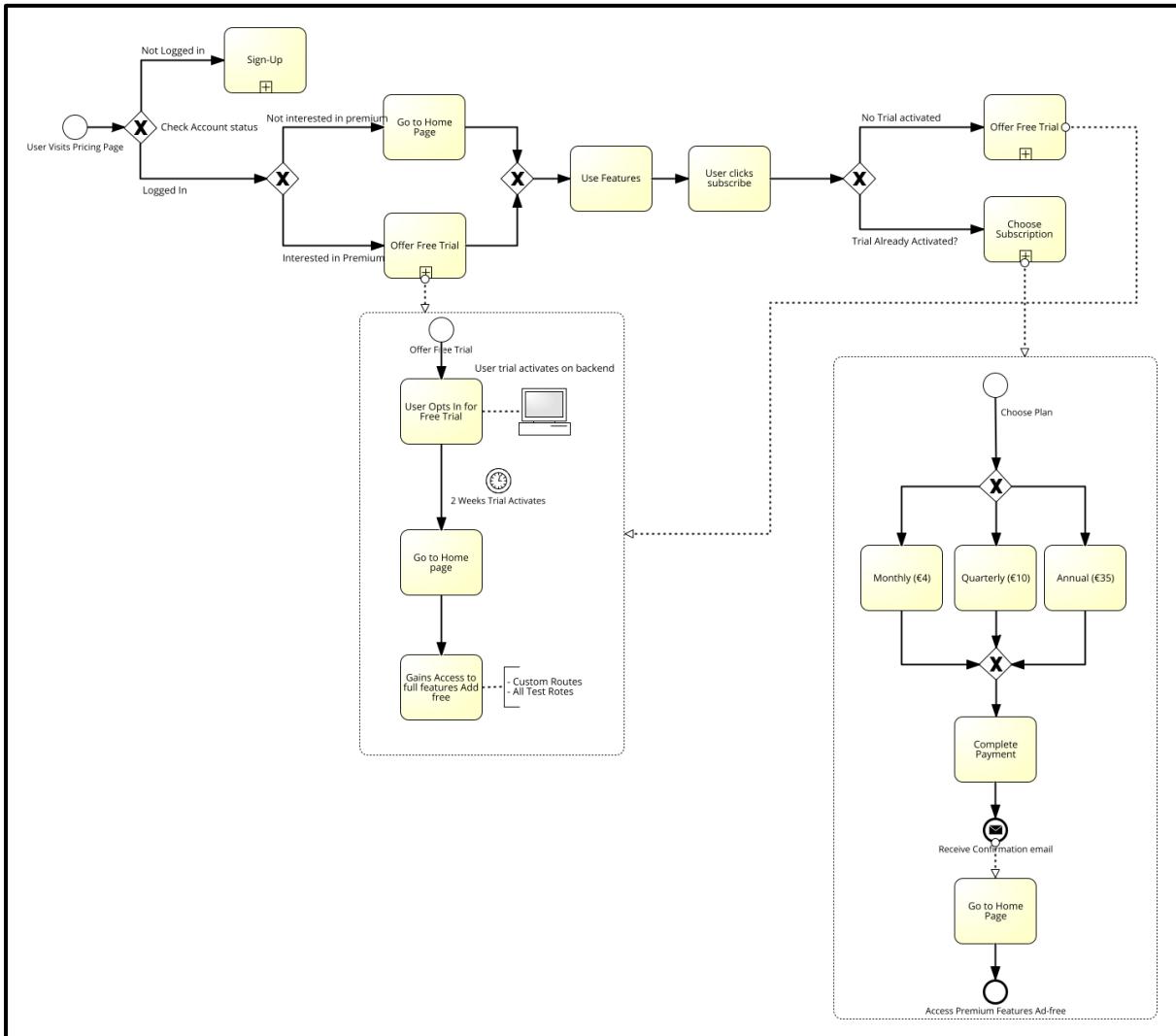
Customer Segment Irish Learner Drivers



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strategyzer.com

## Pricing Process BMPN



## Insurance Quote

The screenshot shows the Chill insurance quote interface. On the left, under 'YOUR OFFICE QUOTE', it displays a large green '€491'. Below this, a note states: 'The above quote is an estimate and based on assumptions.' Under 'WE'LL TAKE IT FROM HERE', it says: 'Our friendly team will give you a call shortly to discuss your quote, or you can give them a call now on 01 4003435'. A bold purple button at the bottom reads 'Chill, we'll take it from here!'. On the right, under 'VAN INSURANCE', there's a 'Van INSURANCE' section with a small van icon and a 'GET A QUOTE' button. Below that is a 'SUMMARY OF DETAILS' section containing the following information:

Office Insurance	Test Test wopap@3149@mkg.com
Business Sector	IT Computer Services
Public Liability	€2,000,000
Buildings Cover	€1,589
Contents Cover	€0

## Business Loan Calculator

The screenshot shows a business loan calculator. At the top, it says 'Business Loan Calculator'. Below that, there's a '← change' link and the text '€120000 over 60 months'. It then displays the following information:

**Monthly repayments**  
**€2,378.98**

**Total repayments**  
€142,738.54

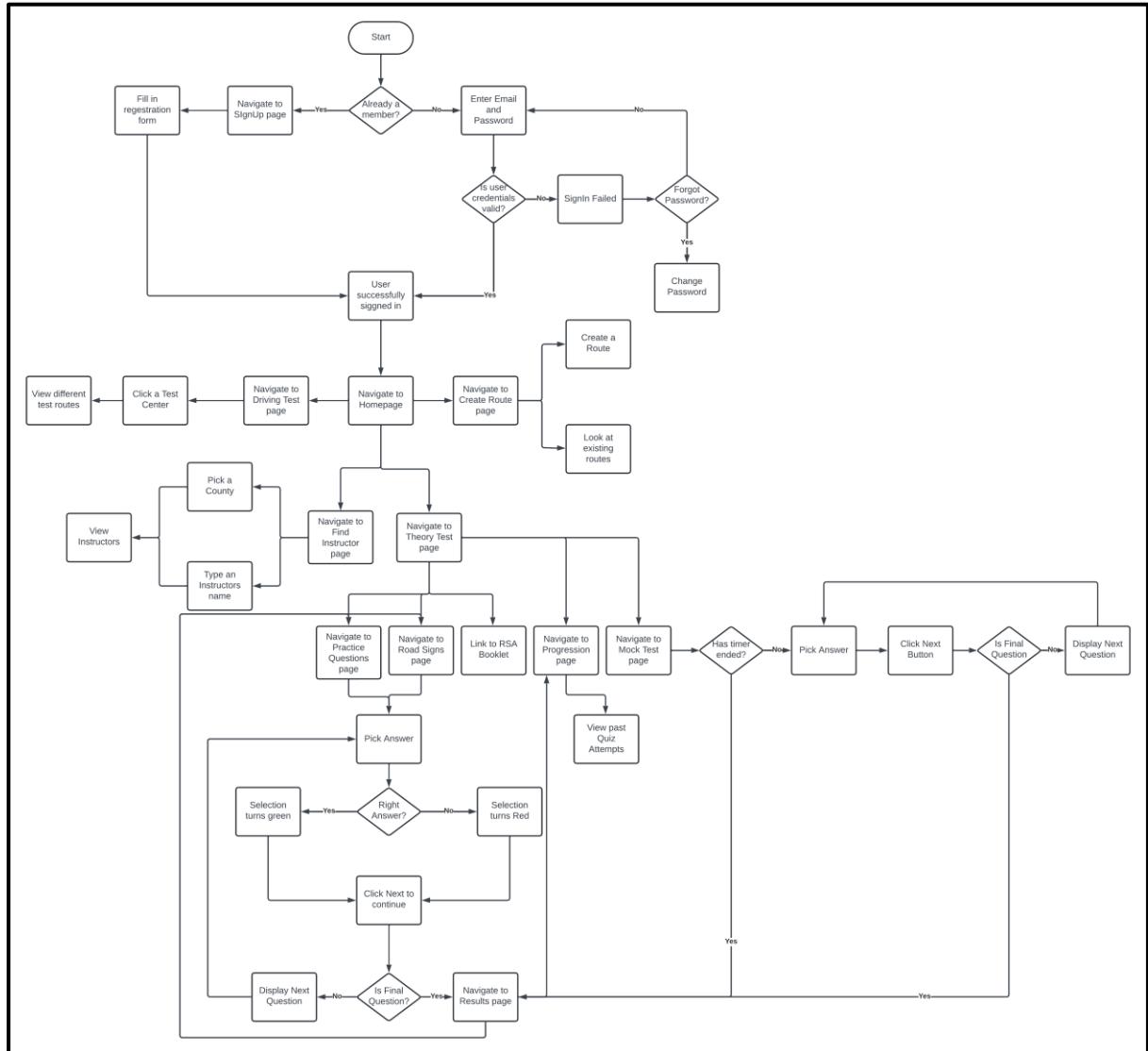
**Total cost of credit**  
€22,738.54

**Interest Rate**  
7.05%

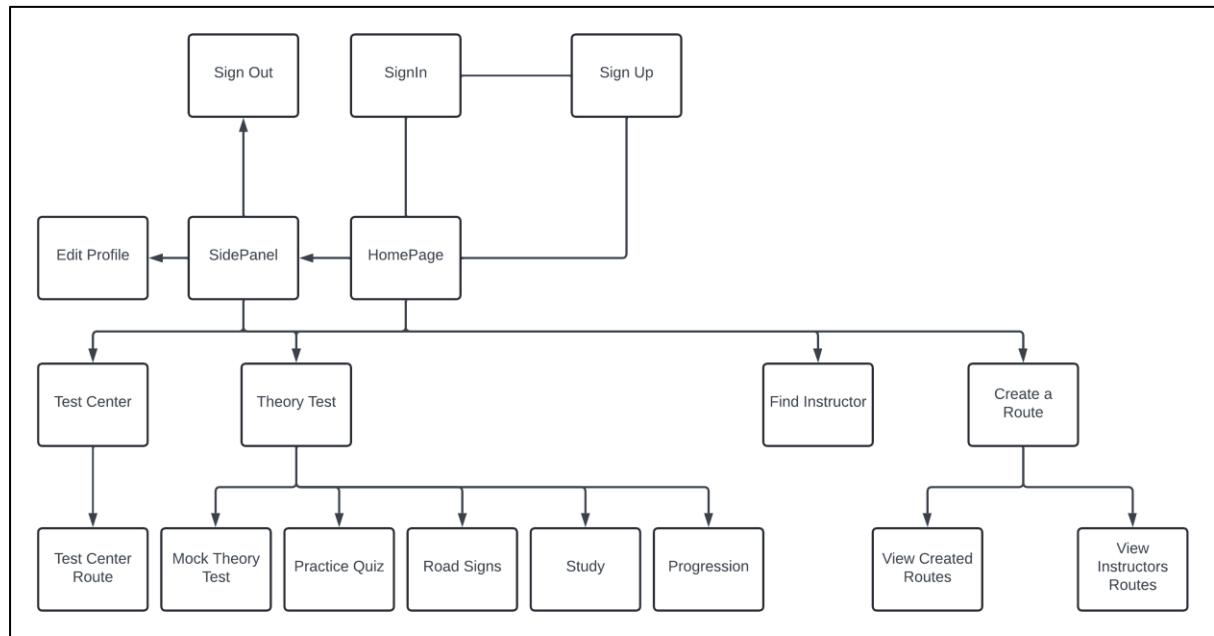
# Financial Projections for Year 1

Investment Income	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Oct	Nov	Dec	Year Total
Business Loan (BOI)	€120,000	-	-	-	-	-	-	-	-	-	-	€120,000
-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Totals</b>	<b>€120,000</b>	-	-	-	-	-	-	-	-	-	-	<b>€120,000</b>
Operating Revenue	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Oct	Nov	Dec	Year Total
Premium Sales	-	-	-	€2,773	€3,965	€4,908	€5,680	€6,397	€7,071	€7,625	€8,124	€46,543
Ad Revenue	-	-	-	€2,868	€4,101	€5,076	€5,844	€6,581	€7,313	€7,887	€8,403	€48,074
-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Totals</b>	-	-	-	<b>€5,641</b>	<b>€8,066</b>	<b>€9,984</b>	<b>€11,524</b>	<b>€12,978</b>	<b>€14,384</b>	<b>€15,512</b>	<b>€16,527</b>	<b>€94,617</b>
Monthly Expenses	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Oct	Nov	Dec	Year Total
Salaries (devs)	€11,162	€11,162	€11,162	€11,162	€11,162	€11,162	€11,162	€11,162	€11,162	€11,162	€11,162	€122,782
Salaries (support)	-	-	-	€2,268	€2,268	€2,268	€2,268	€2,268	€2,268	€2,268	€2,268	€18,144
Firebase	-	-	-	-	-	-	-	-	-	-	-	-
Insurance	€491	-	-	-	-	-	-	-	-	-	-	€491
Marketing	-	-	-	€2,300	€2,300	€2,300	€300	€300	€300	€300	-	€7,800
Rent	€1,589	€1,589	€1,589	€1,589	€1,589	€1,589	€1,589	€1,589	€1,589	€1,589	€1,589	€17,479
Equipment	€3,276	-	-	-	-	-	-	-	-	-	-	€3,276
Play Store Payment	-	-	-	€25	-	-	-	-	-	-	-	€25
App Store Payment	-	-	-	€92	-	-	-	-	-	-	-	€92
Loan Repayments	-	-	-	€2,378	€2,378	€2,378	€2,378	€2,378	€2,378	€2,378	€2,378	€19,024
-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Totals</b>	<b>€16,518</b>	<b>€12,751</b>	<b>€12,751</b>	<b>€19,814</b>	<b>€19,697</b>	<b>€19,697</b>	<b>€17,697</b>	<b>€17,697</b>	<b>€17,697</b>	<b>€17,397</b>	<b>€17,397</b>	<b>€189,113</b>
Overview	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Oct	Nov	Dec	
Cumulative Expenses	€16,518	€29,269	€42,020	€61,834	€81,531	€101,228	€118,925	€136,622	€154,319	€171,716	€189,113	
Cumulative Income	€120,000	€120,000	€120,000	€125,641	€133,707	€143,691	€155,215	€168,193	€182,578	€198,089	€214,617	
Status	€103,482	€90,731	€77,980	€63,807	€52,176	€42,463	€36,290	€31,571	€28,259	€26,373	€25,504	

## Flowchart

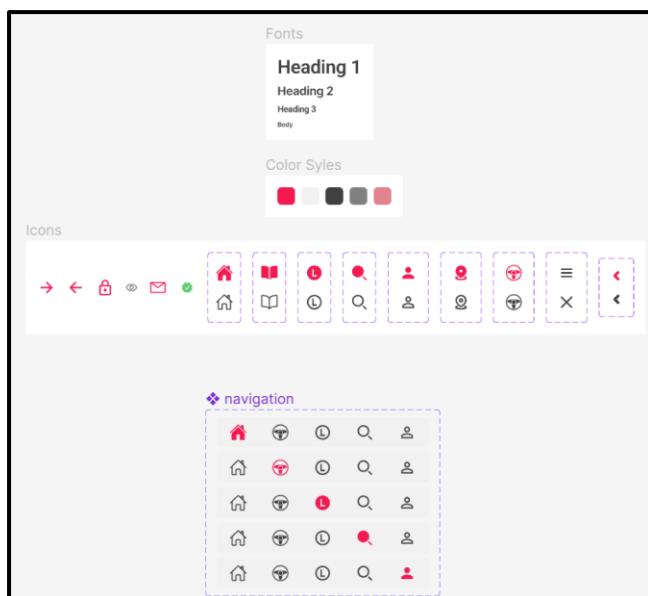


## Hierarchy Diagram

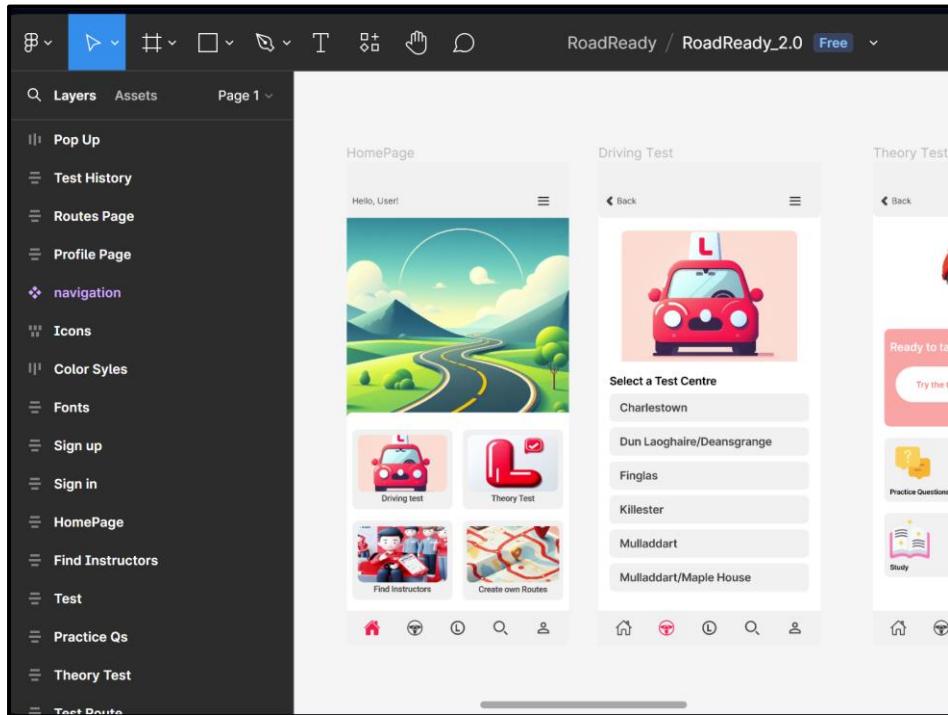


## Figma and Locofy Implementation

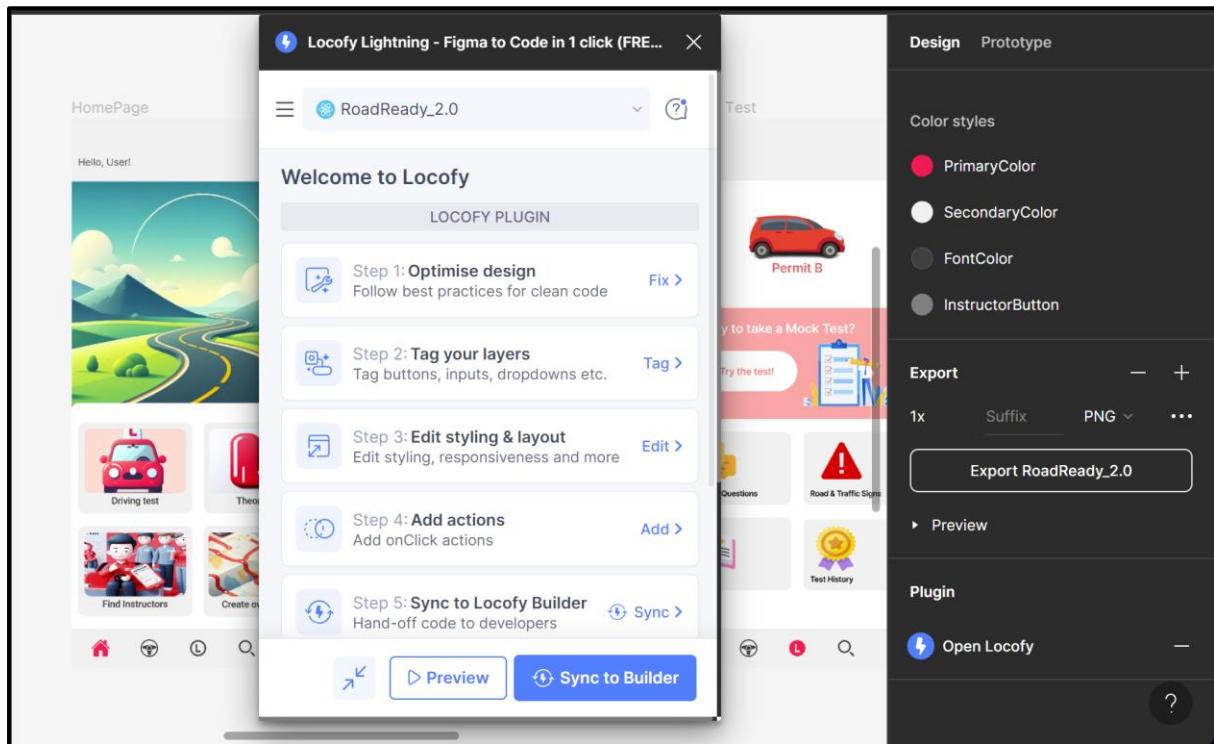
### Components



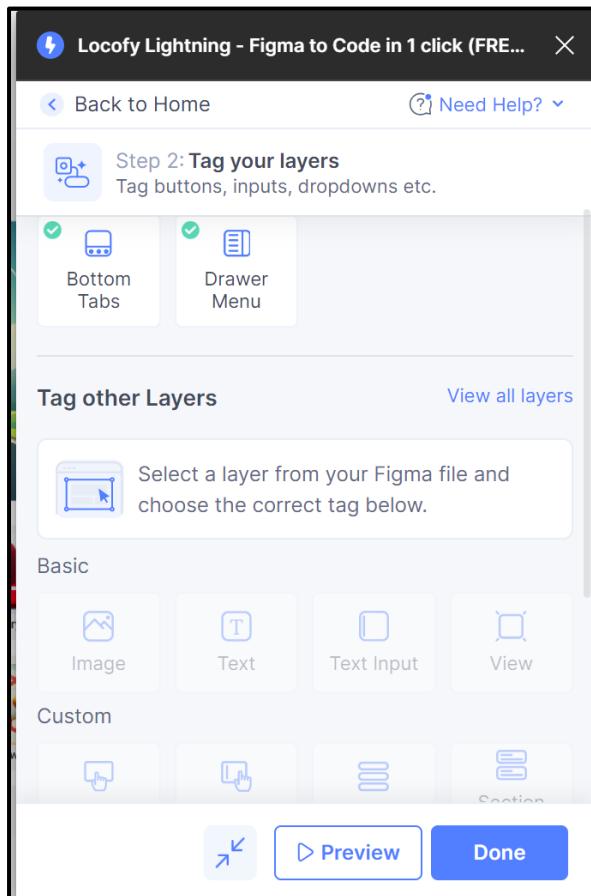
## Figma Pages



## Using Locofy



## Tagging with Locofy

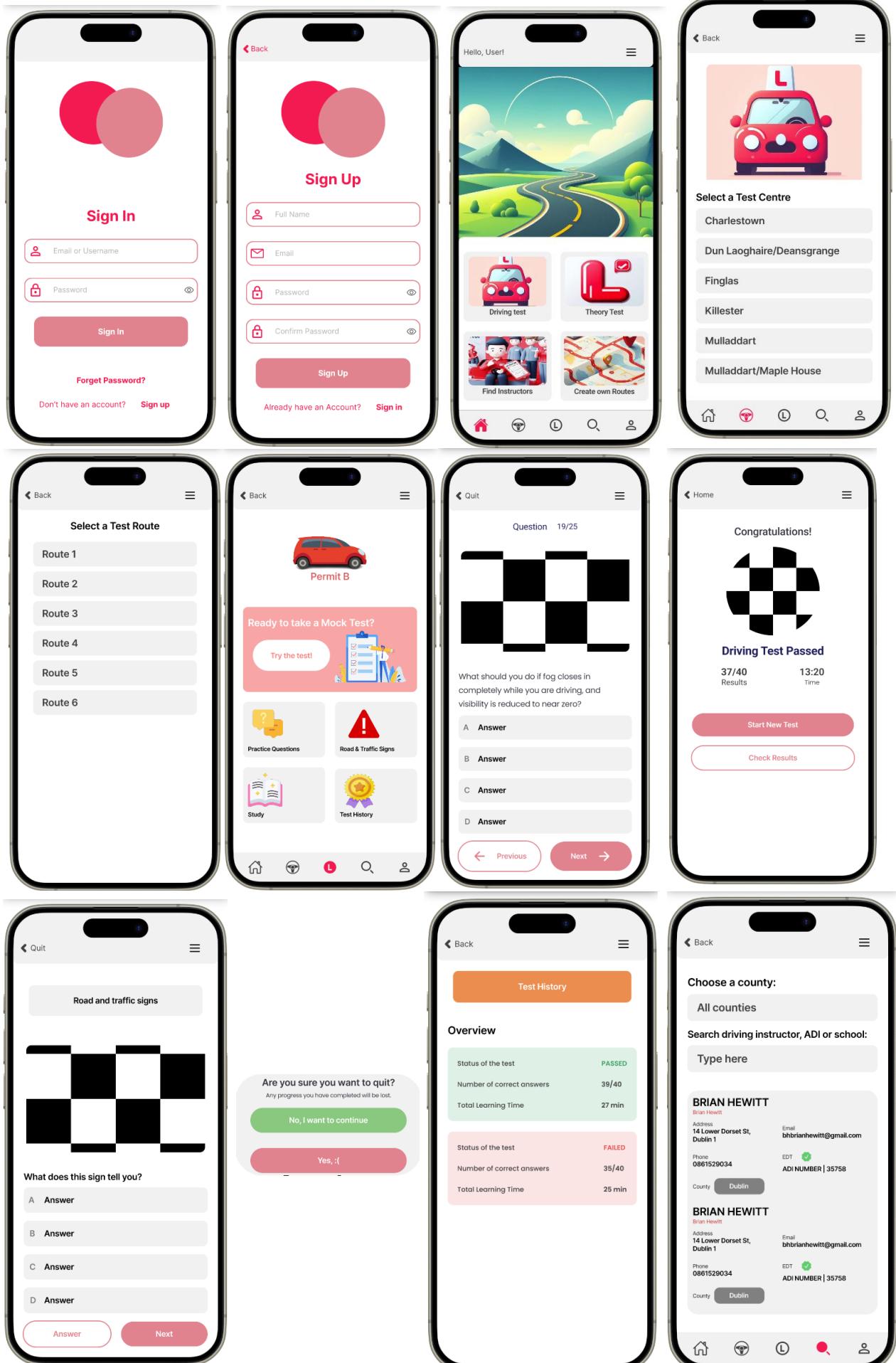


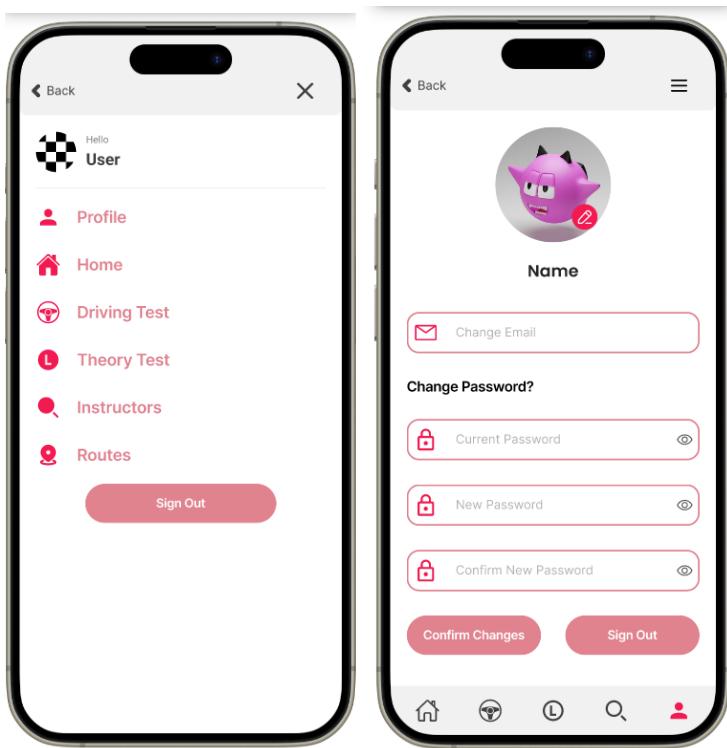
## Using Locofy Builder

```
1 import * as React from "react";
2 import {
3   StyleSheet,
4   View,
5   Pressable,
6   Touchableopacity,
7   ScrollView,
8   Text,
9 } from "react-native";
10 import { Image } from "expo-image";
11 import { useNavigation } from "@react-navigation/native";
12 import { Color, Border, FontFamily, FontSize, Padding } from "react-native";
13
14 const HomePage = () => {
15   const navigation = useNavigation();
16
17   return (
18     <View style={[styles.homepage, styles.homepageLandscape]}>
19       <View style={[styles.titlebar, styles.titlebarLandscape]}>
20         <View style={styles.backButton} />
21         <Pressable
22           style={[styles.hamburgerOnOff, styles.icon]}
23           activeOpacity={0.2}
24           onPress={() => navigation.toggleDrawer()}>
25             <Image
26               style={styles.vectorIcon}
27               contentFit="cover"
28               source={require("../assets/vector32.png")}
29             />
30           </Pressable>
31         </View>
32       </View>
33       <ScrollView>
```

The right side of the interface shows a preview of the mobile application screen, which features a landscape scene with a winding road and mountains. Below the landscape are four cards: 'Driving test', 'Theory Test', 'Find Instructors', and 'Create own routes'. The top right corner of the interface shows a 'Sync / Export' button and a 'Settings' panel with a list of steps: Step 1: Optimise design, Step 2: Tag interactive elements, Step 3: Edit styling & layout, Step 4: Add actions, Step 5: Sync to Locofy Builder, Step 6: Make Components, Step 7: Bind Data, Step 8: Configure Code, and Step 9: Sync & Export.

# UI Designs in Order





## Error Planning

### Assigning Tasks

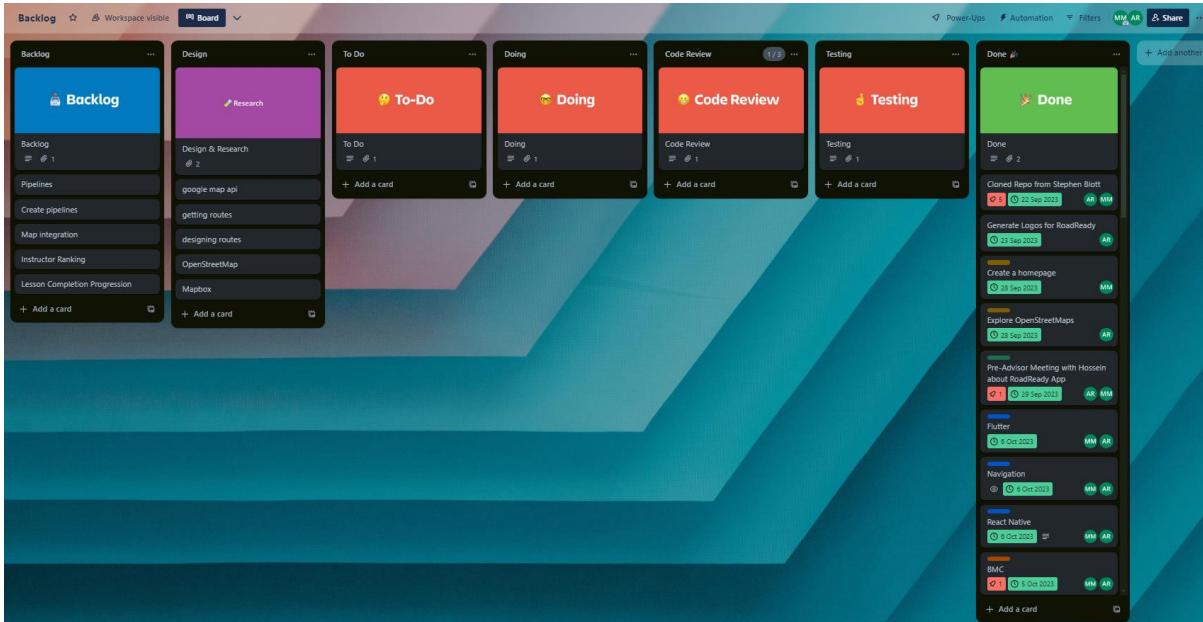
To assign tasks we have created a Trello Board which we will create a backlog of tasks and assign ourselves to each task. Each task will have a due date and a difficulty label assigned to it. The difficulty labels will be colour coded based on time it will take to complete each task.

- Green: The Green label is used for tasks that can be completed in a single day.
- Yellow: The Yellow label is used for tasks that is estimated to be completed within 2 - 4 days.
- Orange: The Orange label is used for tasks that are estimated to take more than a week to complete but less than 2 weeks to complete.
- Red: The Red label is used for any difficult tasks that could take the full iteration to complete.
- Blue: The Blue label is for any research tasks needed to complete other tasks.

To monitor the progression of each task we have different stages in our Trello Board this allows each member to showcase the progression of each task. This allows us to see which task is falling behind and what focus needs to be placed in order to get the task back on track to meet the desired deliverable time.

- Backlog: Backlog is where we put tasks that are created but not fully complete and more information is needed before we can work on them.

- **Research:** The Research section is where tasks that needs more practice and research to complete. An example of this is learning a new coding language.
- **To-Do:** The To-Do section is for tasks that has all the information and is ready to be picked up.
- **Doing:** The Doing section is for tasks that have been assigned and are currently being worked on by a team member.
- **Code Review:** The Code Review section is when a task is ready, and a merge request is created but needs another member to look through the code to make sure there is no errors in the code. This section is to allow another perspective to the code before it is pushed to the main repository.
- **Testing:** The Testing Section is for when a task has passed code review and is pushed to the main repository. The new addition needs to be tested to see if any errors are created or other features breaks. If the errors are created the task goes back to the Doing section and the repository is rolled back to the previous version.
- **Done:** The Done section is when the task is done, reviewed, and tested with everything working it will be moved to Done. At this point if the member has completed all their tasks early they can pick up a new task from the To-Do section.



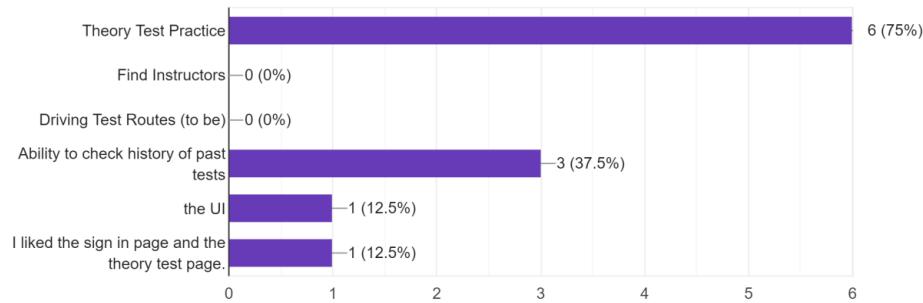
Link to the Trello Board:

<https://trello.com/invite/b/YBMDGjNa/ATTIbe2585018e7e64924eac4a46c7573d5b1275A432/backlog>

## User Testing:

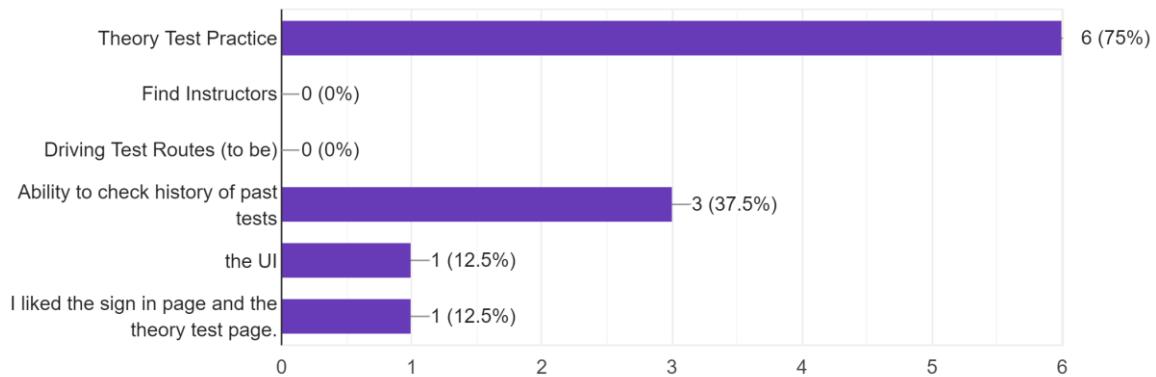
What feature did you like the most?

8 responses



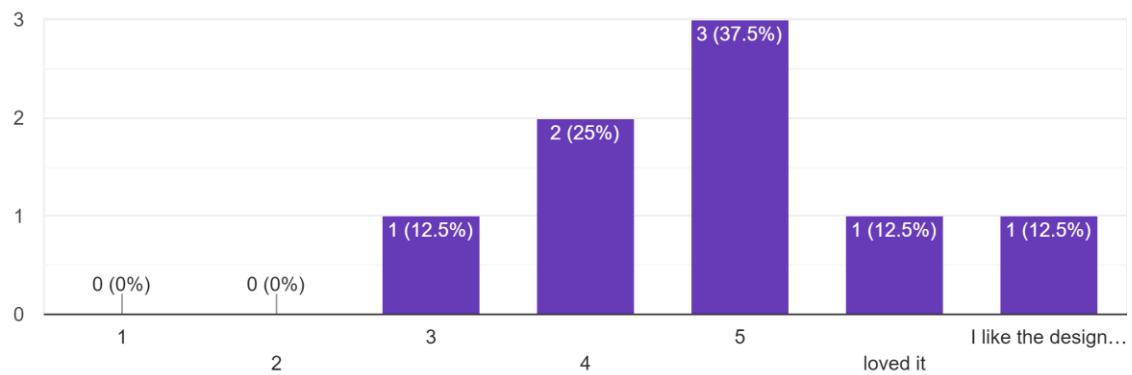
What feature did you like the most?

8 responses



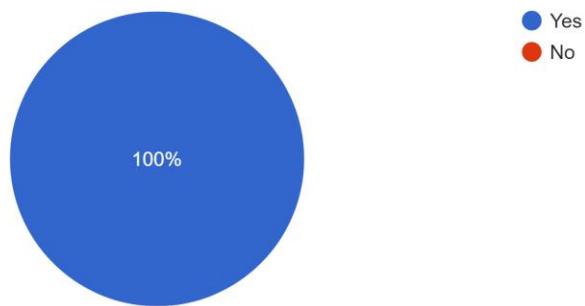
How intuitive do you find the app's design and layout?

8 responses



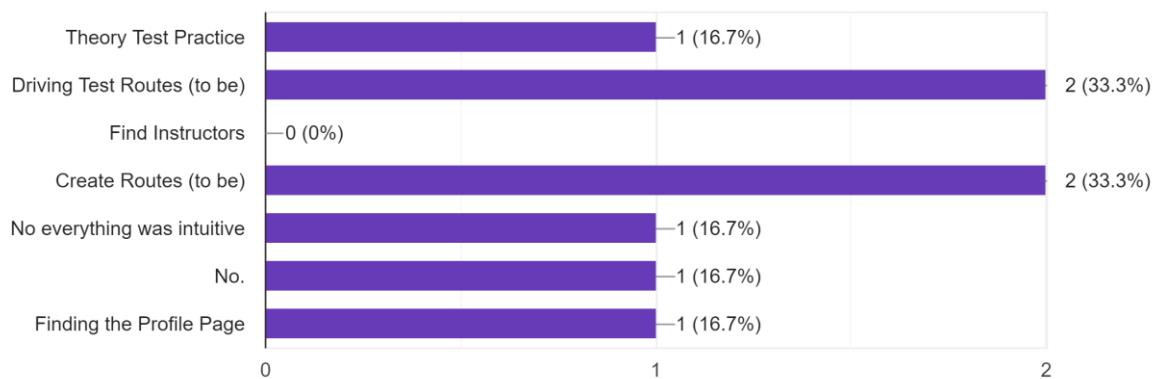
Was the app easy to navigate and understand?

8 responses



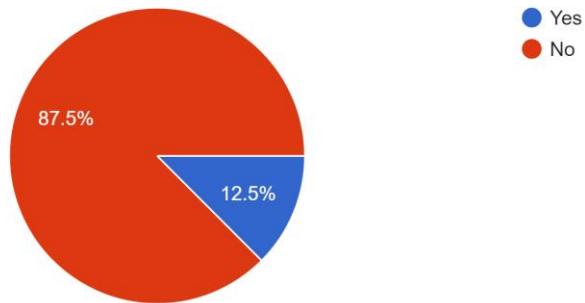
Which feature(s) did you have difficulty finding? (Select all that apply)

6 responses



Did all the app's features work as expected?

8 responses



If you selected "No" can you please explain why?

7 responses

When I clicked out of practice test I got an error box that didn't close when I selected yes out no. The yes add no boxes also appeared to be greyed out as they were coloured in pastel.

I was unable to update my profile

Issues with the navigating across different pages. if there is an error the bottom menu disappears and the top right hand side menu also stops working

The 'Don't have an account?' button doesn't work when clicked and the create routes page is under construction.

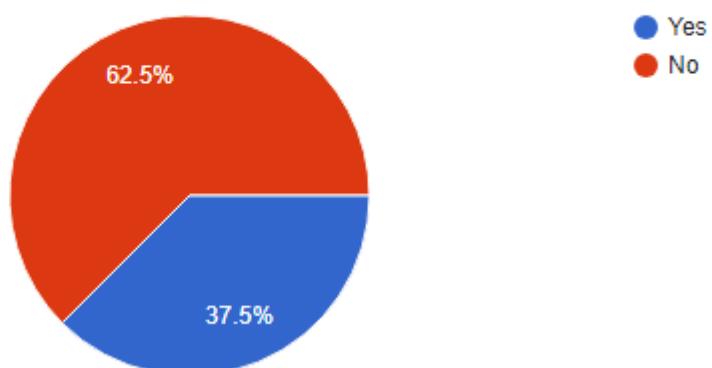
I was unable to change my name/ upload image in the profile section

The finding instructors feature didn't change when i typed any new names in or changed county

Create's routes page is under construction and test routes don't work

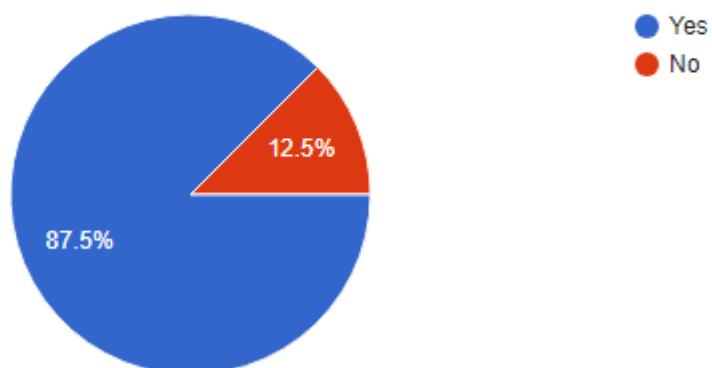
Were there any features you found confusing or unnecessary?

8 responses



Did you encounter any bugs or glitches while using the app?

8 responses



If you selected "Yes" could you please describe what the bug was, where it occurred and why you think it is a bug?

7 responses

Error box not closing  
Pictures not appearing

when in sign in page the "Don't have an account?" button didnt work

bug on navigation between pages

Sometimes the bar at the bottom of the home page would disappear when clicked as well as the 3 lines in the top right corner not working in all parts of the app.

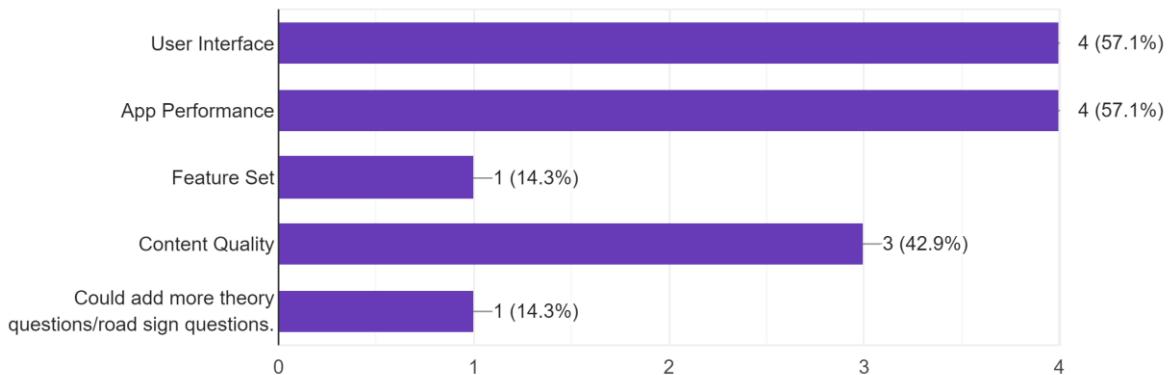
In the theory test page when i click the side panel the text for one of the sections disappears

When clicking back in the practice questions a popup appeared and i could close it unless i clicked off the popup instead of clicking the no button, when i clicked yes the popup remained

toggle menu works but only at the start

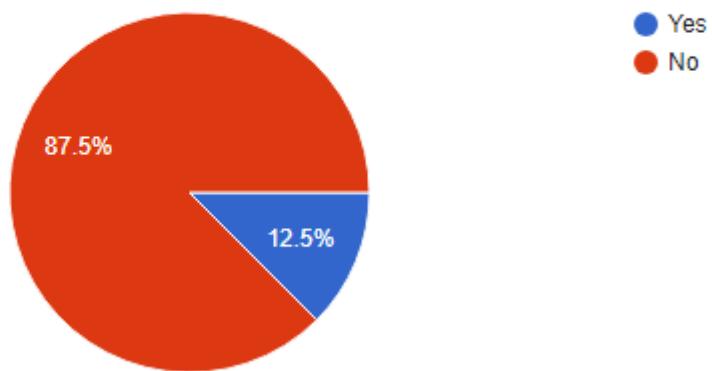
Please select the area(s) you think need improvement: (Select all that apply)

7 responses



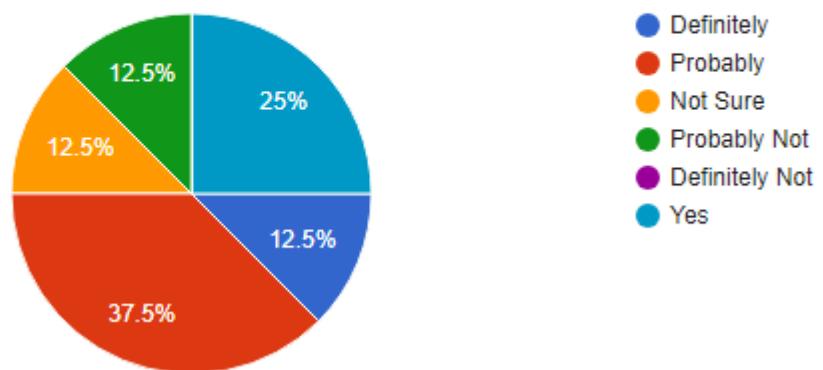
Did you experience any crashes or freezing while using the app?

8 responses



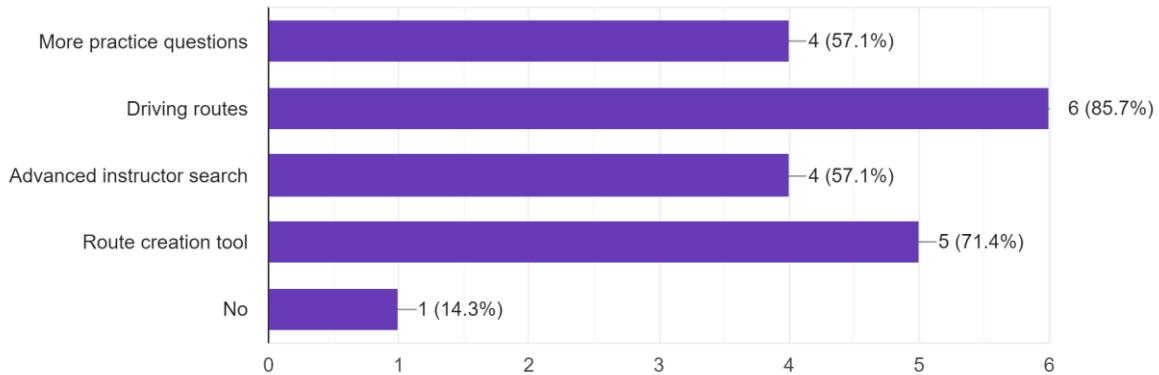
Would you recommend the app to others?

8 responses



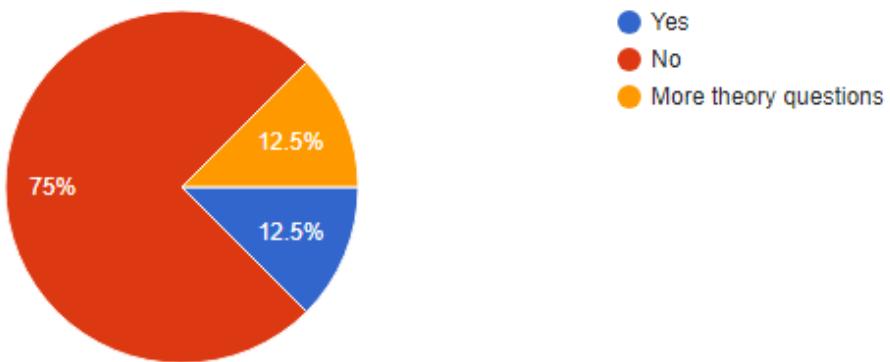
Are there any additional feature(s) you would like to see in the app? (Select all that apply)

7 responses



Are there any features or aspects of other apps that you prefer over this one?

8 responses



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