Dublin City University - School of Computing

BSc in Enterprise Computing
4th year project proposal (CA472)
Idea Proposal
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Project Title:

RoadReady – A driving test route app

Date:

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Project Summary:

Our objective is to design the app “RoadReady” that transforms the way people learn to drive and prepare them for their driving test. By incorporating real-time data, interactive maps and user focused design principles, our primary aim is to enhance the skills and knowledge of leaner drivers enabling them to pass their driving test. According to national figures released by the Freedom of Information Act, there are currently over 300,000 drivers that hold a learner permit, 60,000 of those are currently on the waiting list for their driving test [1].

The driving test route app will serve as an all-in-one solution for learner drivers, offering them several features to improve their preparation for their driving test. Our app will provide real-time navigation for test routes so that learners become familiar with their area and can drive in various roads such as intersections, roundabouts, and junctions. They will be able to design their own routes or use the predefined routes. Our app will include a set of theory questions covering topics like road rules, regulations, and road signs, to ensure learners have a firm understanding of theory questions. This will enable them to recognise what to do if they come across these elements on the road, encouraging safer driving habits and lowering the risk of accidents. In addition, leaners will have the opportunity to take mock theory tests, monitor their progress and receive feedback on their responses. We also intend to provide interactive learning tools to reinforce key driving knowledge by including educational videos, animations and interactive tutorials that cover a range of driving topics such as, parking techniques, manoeuvres, and hazard perception and vehicle control. Whilst the learners are driving, they will also be monitored for speed which will let them know if they are speeding according to the speed limit on the road.

Furthermore, we will adjust to the requirements of learners. We will do this by creating customisable learning paths, allowing learners to concentrate on areas they wish to improve. By adopting this approach, it ensures individuals receive tailored guidance and support.

To reach a wider audience and foster a sense of community, the app will include a social platform within the app, where learners will be able to share their own test routes and experiences keeping learners engaged and motivated as they work towards passing their driving test.

In conclusion, our app aims to revolutionise the way people learn to drive. We accomplish this by offering real-time navigation for test routes, theory test questions, interactive learning tools and a supportive community. Our goal is to equip learners with the skills and knowledge to successfully pass their driving test. Our project not only caters to the needs of learners but also contributes to the overall improvement of road safety and reduction of accidents. By doing so we will be creating a positive impact on the driving ecosystem and promote safer roads for everyone. [2]

Expected Technical Delivery:

We aim to deliver a mobile application that includes live driving test routes, theory test questions, a collection of learning material and interactive feedback. Our technical approach involves us to design the frontend, backend, database management and integration of external tools.

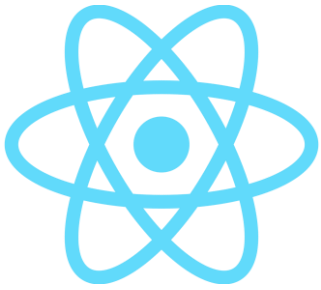


Figure 1 React Native

For the frontend, we have chosen React-Native as our framework because of its extensive libraries of knowledge and compatibility with both Android and iOS which helps us extend our target market. By using React Native, we will be able to effectively develop and deploy our application. Figma will serve as design tool, which will enable us to create a visually appealing and intuitive user interface (UI).

One of the core features of our app is the functionality of live driving test routes. To achieve this, we will integrate "OpenStreetMap", an open-sourced mapping tool, to create routes for each town. OpenStreetMap allows us to create accurate routes which will help provide learner with the precise information on their practice routes, increasing their familiarity and confidence for their driving test.

Figure 2 OpenStreetMap

Figure 3 Firebase

Furthermore, to assist learners in preparing for their theory test, our app will include a set of theory questions and learning materials. To do this, we will be using Firebase, our backend, which will serve as our database management tool. It will store vast amounts of practice questions covering topics such as the rules of the road, risk perception, eco driving, hazard awareness and safe driving behaviour [7].

Firebase will also help in adding constructive feedback for learners. This can be done by analysing driving patterns, analysing the adherence to the test route navigation, and gathering results from their theory questions.

Not only that but it will play a vital role for storing user authentication features, allowing users to create accounts, login and track their progress. Firebase's real-time database capabilities will make sure that the synchronization between the app and server are seamless such as retrieval of user data, theory test results and usage of learning materials.

Figure 4 Expo Go

"Expo go" will ensure the smooth functioning of our app for both Android and iOS devices. It is a platform that allows users to test their mobile applications, without having the need for a complex setup and configuration. With Expo we will be able to quickly develop and make necessary adjustments to ensure that all the UI components and features work as intended across different platforms.

Market Rationale:

Target Market

Although our main target market are Irish learner drivers that are preparing for their driving tests, our app will also cater to the needs of driving instructors/testers as they play a crucial role in training and guiding the learner and even experienced drivers who would want to be supervising the learners for them to practice. Learners will typically fall within the ages of 16 – 25 and are in areas where the driving tests are conducted.

Competitor Analysis

We examined various apps and discovered several existing apps in the market that cater towards learner drivers. One such app we came across is “Irish Driving Test Routes”, which allows users to practice one free route out of eight available routes in towns. While this app provides live navigation and turn-by-turn directions, it lacks a seamless user experience and additional features that learners like me would have like to see.

In addition to this, we noticed that most of the other apps were primarily focused on theory test preparation, such as “Driver Theory Test Ireland”, “iTheory”, and “Official Driving Theory Test”. All the apps including the “Irish Driving Test Route” generally offered limited free features but followed a subscription-based pricing models for the remaining features. The Official Driving Theory Test app is a paid app however and the customer needs to only pay once to enjoy all the features.

Market Validation

To validate the market demand for our app, we will first need to analyse the market and then conduct primary and secondary research methods. For now, however, we know that as of 2016 there were 249,647 drivers with only learner permit licenses [3]. 60,000 are waiting for their driving test this year [4] and as of 2021/22 there are 246,000 students in further education. [5]

For primary research, we will carry out surveys, interviews and focus groups directly with the target audience. Learner drivers and driving instructors will provide insights into their specific needs, challenges, and preferences. We will gather feedback on our proposal, such as live navigation during practicing, customisable route planning, and educational suggestions. This primary research will help us tailer the app to the users’ requirements and expectations.

For secondary research, our aim will be to gain a deeper understanding of the driving apps market, including existing solutions, competitors and market trends. We will analyse reports and publications to identify the gaps and the places we can fill those gaps. In addition to that we will examine the demand for similar products and services among driving instructors and the learner driver’s community. This research will provide us with valuable insights to position our app and refine our marketing and business strategies.

Proposed Timeline:

Please provide a basic timeline plan for the project from now, until the end of semester 2. What are the tasks that need to be addressed and who will take responsibility for them?

For the timeline of our project, we have decided to go with an agile development plan. We have decided to go with Agile over other development methods such as Scrum or Kanban because as Agile is highly flexible meaning changes can be made easily during the project. Agile has better communication between the team as we will have daily standups updating each other on our development on each story and at the end of each sprint we will have a sprint review to showcase each story to our supervisor to get feedback on the sprint. On top of this at the end of each month we plan to do a backlog refinement where we update stories and possibly remove redundant stories. Agile has reduced risks as condensing down the project into sprints allowing for problems to be caught using backlog refinements and added into a future sprint. [6]

Each sprint will be around 4 weeks in length depending on the number of stories and the difficulty of each story. To create stories and manage the workflow we have decided to use Trello using this we will assign stories to either of us or manage the development of each sprint.

Research & Development

We created a Gantt chart to plan the length of each sprint to prevent any unexpected circumstances. In the first sprint we have designated this sprint for researching aspects we are not knowledgeable on such as integrating maps, this sprint is also designated for setting up the basics to start development we can see this through some of the stories “clone the repo” and “create a homepage”. These stories can have unforeseen tasks for example needing to install specific versions of dependencies that might not be compatible with other dependencies requiring a different approach to a task. In this sprint we aim to be completed by the 20th of October.

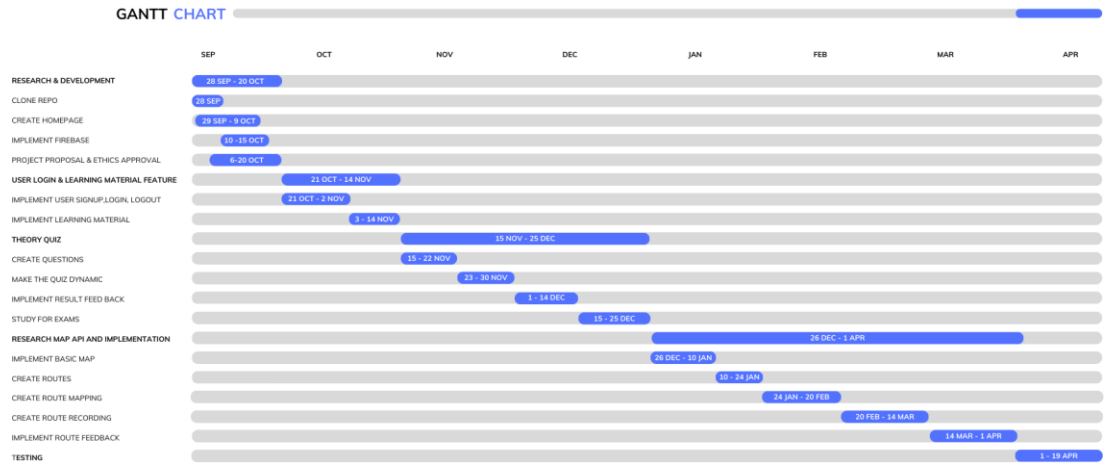
Our application will have 3 main features which we have decided to split each into their own respective sprints. The first feature is the easiest feature to implement so we have additional stories to create login for the users as the difficulty of this sprint is low it only spans 2 weeks.

User Login & Learning Material

The next sprint is to implement a theory quiz which involves creating questions and adding them to the database, making the quiz dynamic and be different every time, and adding feedback depending on the results. During this sprint we also have exams, so we have taken out 2 weeks to allow for study and sit the exams. Because of the number of stories and tasks including study we have designated this sprint for around 5 weeks, aiming to complete this sprint by the 14th of November.

Research Map API & Implementation
The next sprint we will implement a Map to our app, create routes to follow, create a tool to create new routes, create route recording to track the user during the route, implement feedback once the route has been completed. This sprint is the most difficult feature to implement so it will have the longest development time delegated being 12 weeks, aiming to complete the sprint by 1st of April. The reason why this feature is being implemented last is because we can start development after our exams.

Testing
The last sprint is testing to make sure everything works and to include user testing to tweak UI aspects and improve the app to make a better product for the user.



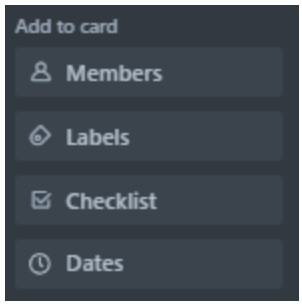
Link to Gantt Chart: https://www.canva.com/design/DAFxkIFO7lk/UCIQM2py4x6jy-MoJDWVeQ/view

Workload Distribution (for teams with 2 or more members):

How will the workload be distributed? Technical and Commercial components? Bullet point listing is adequate.

Work will be distributed through our Trello board which we have set up to see how each story is progressing. Each story will have a number indicator determining how difficult each story will be. Each week we will pick up stories trying to pick of stories adding up to 7 points.

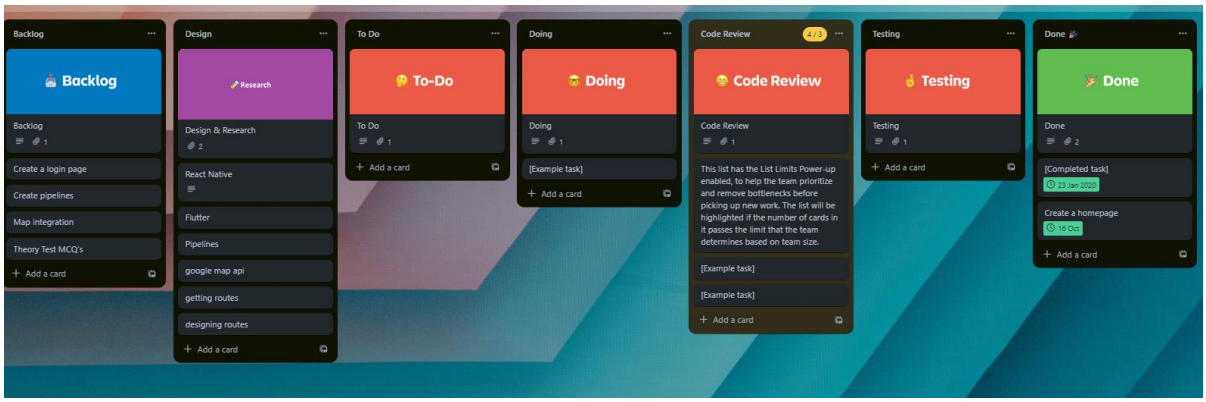
Trello allows extra features such as checklists on a story, one of the fields allows for coloured labels using this we can indicate the types of stories for example blue for technical tasks and red for commercial tasks. A technical task would



require tasks that require coding where commercial tasks would be contacting customers.

In the Trello board we have 7 sections:

- **Backlog** – This is where we put created stories that are not assigned to anyone.
- **Research** – These are stories that are assigned but research is needed before we can work on the story.
- **To Do** – This section is for assigned stories that work hasn't started for and still needs completing.
- **Doing** – This section is for stories that are being worked on.
- **Code Review** – This is for when a story is done and a merge request has been proposed. This needs another member on the development team to review the merge request and once completed the story can move to the next section.
- **Testing** – this is for when the branches have merged to main and the story needs to be tested to see if the changes are live.
- **Done** - This is for when the story has made it through each of the previous stages and no longer requires any further work.



Link to Trello board:
https://trello.com/invite/b/YBMDGjNa/ATTIbe2585018e7e64924eac4a46c7573d5b1275A432/backlog

Staff Consulted:

In the preparation of this document, we consulted with Hossein Javidnia (Hossein.javidnia@dcu.ie)

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