FINAL YEAR Project

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Abstract

For our final year project, we were looking to create an industry stander application that would help farmers in day to day life. There has been a lot of talk in recent weeks about the escalating fodder crisis and the negative impact it is having on farmers and their livestock. For months, farmers have faced difficult farming conditions due to persistent cold and wet weather. Farmers usually purchase enough fodder, dried hay or feed given to cattle and livestock, to last until the spring when the grass begins to grow, and animals can begin to eat that instead. As a team we want to design a free web application where the user can enter data and store it, do out calculations for the fodder months. There is also AI section for keeping track of the herd in the calving months, tagging section for keeping track of new born animals, section for keeping track of the medicine used on the herd throughout the year. We have created this application with a client and server pulling data from databases. We created a three-tier application, using Mongo Db and Firebase as our Data Tier, NodeJS for our Logic Tier and Ionic 3 for our Presentation Tier. Adding specific features such as, adding Al, Tagging, Feed, Madison and creating a message board for farmers to group together and find solution's to problems there are encountering. it was our objectives by gearing our app specifically for farmers.

Authors

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1 Introduction

When choosing our project we wanted to pick something that was relevant to current everyday life. We wanted a project that also highlighted our existing skills and allowed us to learn new skills and develop as part of a team. With this criteria in mind we started brain storming ideas for our project.

We eventually decided on a App called herd list, herd list would be a farming fodder app. We recognized the current fodder crisis throughout Ireland and thought it would benefit farmers and farmers alike to have a specific fodder app for the farming population. Currently farmers in Ireland can find themselves in difficult situations for up to 1 or 2 months before finding proper fodder for animals. This is quiet common for farmers and with our app they would only be able for to calculate fodder for the winter and spring months and keep track of tagging, medicine, AI.

Having a fodder app as our starting point we started to research other apps and websites in the farming category. The main one we focused on was the Heard Watch. Heard Watch would be the most popular farming app in Ireland and it provided us with a great deal of insight on what our app would need to have and also on what heard watch lacks for the farming market.

We wanted a app that had essentially the same functionality as Heard Watch but which was geared more towards the stress points of farming We did this by focusing on what stresses farmers the most, We also created a forum for farmers to get in touch with one another, to either get information from one another or to give information, These would compliment the normal functionality of a accommodation app such as, publish ads (either fodder or rent land), search lists, view ads or messages and land for rent and edit and delete your personal ads. This would also require log in and registration functionality.

After deliberating over the objective of our application, we then turned to what technology we would use. We wanted to use a array of technologies to show our capabilities but also gain more knowledge and become better programmers over all. We settled on a 3 tier structure containing a Ionic 3 presentation tier (front end), NodeJs logic tier (middleware) and Mongo/firebase database data tier (back end).

From what we hoped to achieve from creating this app was the knowledge of new technology, personal growth through team building and of course to produce something of substance and something we could be proud of.

2 Context

The general context of our application revolves around farmers having a platform which is geared towards tracking fodder, and there heard. farmers will be able to calculate amounts of fodder for the winter months and use the app to keep track of the tagging of new born animals, track medicines for animals throughout the year. And store AI information to which heard animal are in calf and how far alone they are gone and when they are due.

- Feed
- AI
- Medicine
- Tagging

3 Objectives

The main objective of our application is to help farmers who may be struggling with the current fodder crisis in Ireland. We also wanted to make it easier for farmers and farmers alike, who are finding it difficult to keep track fodder, AI, Medicine and Tagging. The following is a list of the main pages in our application along with the objectives for each page.

1. **Login/Register Page** Our application has a login and a register page. The register page allows the user to securely register with our application while the login page allows the user to securely login to our application. Once logged in, the user has access to extra features not accessible to unregistered users.

2. **Forgot-Password Page** The objective of the forgot-password page is to allow a user who has forgotten their password to enter their email address. They will then receive an email containing a link which will allow them to create a new password.

3. **Home Page** The objective of the homepage is that it is a base of navigation for the application. The homepage will also display if a user is logged in or not.

4. **Feed** The objective of this feed page is to display is to calculate out how much feed you need for the winter months by entering the number of animals on the farm and calculate out how much is needed.

5. **Tagging** The objective of this tagging page is to keep track of the heard animals calving by inputting the details of birth,gender and breed of the animal. This will allow the user to keep track in an easy way of filling in form details at there own personal time..

6. **AI** The objective of this AI page is to keep track of witch hear animals are in calf and how far gone they are and witch are not in calf this will allow the user to keep track of heard and when they are to calf buy filling in form details as it is being read out.

7. **Medicine** The objective of this medicine page is to keep track of all the animals medicine that have been taken, show when it was taken, how much was taken. This will allow the user to keep track of heard medicine buy filling in form details.

8. **Message Board** The objective of the message board is to have a place where farmers can communicate with each other, helping themselves and other farmers with problems and place ads for stock.

9. **My Ads Page** The objective of the Ad's page is to allow a user to view a list of their published ads. In here they can delete these ads or they have the option to edit their published ads.

4 Project Links

Link to Repository

- https://github.com/Gazza1996/Final-Year-Project-Applied-Diss

5 Chapters Review

This paper is broken down into different chapters, ranging from planning, design and development. The following sub-sections give a brief overview of each chapter in this paper.

5.1 Methodology

In this Chapter we discuss some of the methodologies we used during the various stages of creating the farming app. In this section we discuss Agile, version control, testing and sprints.

5.2 Technology Review

In the Technology Review chapter we review the various technologies we used in our project. We review back and front end technologies, development tools and version control.

5.3 System Design

In this chapter we give a detailed explanation of the overall system architecture and design of farmers app. We explain why we chose these specific technologies and how we implemented them into our system design.

5.4 System Evaluation

In this chapter we evaluate our system in the areas of Robustness, Testing, Scalability, Results against Objectives and Limitations.

5.5 Conclusion

In the conclusion we summaries our project against our goals and objectives. We review our application from the various stages and speak about possible future development.

6 Methodology

In this chapter we discuss the methodologies used in our project. A methodology is just a way to plan and control the development process of a piece of software. There are various methodologies to choose from including Extreme Programming, Rapid Application Development or Waterfall but for this project we use Agile as our main methodology.

7 Agile Development

During the life cycle of our project we attempted to use an Agile like approach to the research, design and implementation stages of the project. In the initial stages of the project we discussed various methodologies we could use, for example Waterfall but we decided on Agile because of waterfalls lack of flexibility. Agile offers continual improvement, flexibility and incremental delivery of the software.

During the research and development process of our project we used a Scrum like approach. Scrum is an Agile method in which a development cycle is carried out in what are known as sprints. We will be discussing on this sprites later, as these sprites contains more information on each sprint of the research and development phase of the project.

Throughout the life cycle of the project we held weekly meetings. In these meetings we would plan and discuss the features of our application. Before each sprint of our project, we used these meetings to plan our sprint cycle. Results from these meetings were then added as to-dos and added to a Git-Hub projects page. Git-Hub projects board help us prioritize and organize our work load. We found this to be an especially useful tool. Once an issue was created it was added into the To-do phase. Then, when we started working on a problem it got added to in-progress, then finally into the completed section once the task was done. A snapshot of our Git-Hub Projects page can be found in Figure !!NEED TO INSERT IMAGE OF TODO LIST!!

We also had weekly contact with our project supervisor. Our supervisor was instrumental in advising us on our progress and helping us with issues with the project.

8 Version Control

Throughout the life cycle of our project we used Git-Hub. Git-Hub is a hosting service for version control. We created a Git-Hub repository, adding all the members of the team to work as collaborators. We found Git-Hub to be an extremely useful tool in the research and development of Farmers app. Even though we primarily used Git-Hub to manage source code, we also took

advantage of some collaboration features that Git-Hub offers. We used wikis to track what we learned in the research stages of our project. A wiki is a website where multiple users can modify content directly from their browser. We used Git-Hub's task management tool when a task was set and then used this tool to track that tasks progress. We found this tool particularly useful as it helped break down the workload into small manageable tasks.
As a team, working with source code on Git-Hub proved to be its most valuable feature. Git-Hub allows all members of the team to see all the commits made to the repository. We can see every update, previewing every change that was made and even rolling back a commit if necessary.

9 Testing

For our application, We needed to make a decision on how we would test the application as we did not choose to use a framework (i.e. J-unit) to test our application, we did however decide to use both white and black box testing.

9.1 White Box Testing

White box testing is a way of testing software where the tester can see the internal workings of the software. White box testers have full knowledge of the internal makeup of the software and are usually software developers themselves. In our application, to white box test, one team member would write a feature (e.g. login) and then another team member would test that functionality. That team member would present input, follow the path through the code and then examine the output. A diagram of white box testing can be found in Fig !!SLAP A IMAGE HERE!!

9.2 Black Box Testing

Black box testing is a way of testing a piece of software without knowing the internal functionality of the software being tested. A black box tester has no knowledge of the internal design, structure or implementation of the software and are often not programmers themselves. In our application, to black box test, we would ask friends to use our application e.g. asking them to login to the application and to maneuver through the application and then reporting their experience. With this type of testing, the tester is trying to break

your application looking for faults. We found this type of testing especially useful as it gave us an insight into the way a user would use our application, something we previously would not have thought of when developing this farming application. A diagram of black box testing can be found in Fig !!SLAP AN IMAGE HERE!!