

Shifts – The Rostering System

Kellie Hughes – X12388761 – kellie.hughes@student.ncirl.ie

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Project Submission Sheet – 2015/2016
School of Computing

Student Name: Kellie Hughes

Student ID: X12388761

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Submission

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- the imposition of a fine and

the requirement that a student to attend additional or other lectures or courses or undertake additional academic work.

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Executive Summary

The objective of the Shifts project is to mend the communication barriers between employee and employer and for the application to be hosted on a cloud based platform. Shifts makes it easy to communicate within the business without needing to be present at the business. Shifts can show rosters, update rosters, request days off and has a built in chat for work based communication.

Shifts is deployed on Heroku and we developed it in PHP, JavaScript, HTML and Firebase. Shifts does well as a web application because the research has proven that Shifts is a one of a kind product with no competitors.

1 Introduction

The premise of the project is to develop a product within our field of specialization (e.g. website, application or game). This project is a web-based application that is hosted on a Cloud Hosting platform for example Heroku, the project is also integrated with a Backend as a Service known as Firebase. This application is named 'Shifts' and it provides a solution for people who work in hourly rated business to be able to see their shifts easily online. In addition, the application allows the employer to manage all the employees shifts.

1.1 Background

Currently in the process of completing my 3rd year working for Paddy Power PLC. Paddy Power is a great company and has been very supportive of college students during their studies. They understand that they need to work to be able to afford to live during their studies but also need to have time off to study and to do exams. They are very understanding and for this they are repaid in loyalty to the business and hard workers. Paddy Power hire a lot of young part time students. However if you are not working when the roster has been done it can be very hard to know what day and times you are working.

Research was taken out on the idea of having a web based application in which you could see your shifts online with the managers in Paddy Power and she seemed to think it was a very good idea for both the employee and employer, for the employee will be happy that they can see their rosters easily and a happy employee leads to a good business ethic which leads to happy customers and therefore happy employers.

Research was also taken out on other students that have part time jobs (Some employees from Nandos) and they thought that this would be a great system for Nandos to integrate into their business too.

The target market for the project is large and small companies that base their hours on shift work rosters and also forgetful members of staff will benefit greatly. This

will prevent staff members phoning the company and asking for their hours therefore delaying the workflow.

We developed the idea further, to allow the employees to not only see their roster (e.g. for the current week, the next week, etc.), but to also be able to request time off. The request would be messaged to the manager of the employment and then the time off can be approved or denied. This makes asking for time off, quick, easy and painless.

The same system can also be integrated for asking for a shift change within the roster. If there is a shift that an employee is not available to do that the employee could message the manager and request for this shift to be changed.

Finally the system will have a chat system in which you can talk to your colleges if you need to ask them something. This is extremely beneficial to larger companies where contact details are not as well known.

1.2 Aims

The aim of the project is to create and be proud of a project from scratch and turn it into something that is usable and somewhat beneficial to other people in the future.

To create an application in which businesses can integrate easily into their already functioning systems without hassle. To create a platform for the businesses that could be used by big businesses or small businesses depending on your needs. In the past there has been applications for very large corporations like Abercrombie and Fitch, which have an in-house system like this, but we would like to create an application that is usable by all businesses, in particular small and medium, by providing it as an application as a service.

With this app it could go on to create a happy work environment with clearer goals and more time to focus on the things that should be happening in the normal day to day of the job. Increasing the conversation in work would be a beneficial factor for staff moral and productivity.

1.3 Market Research

Once we decided on a project idea and the goals were set, the next thing on the list was to do market research to find out if the project seemed like a good idea to other people that may in the future use the product.

1.3.1 Employee and Employer Opinions

In the early stages of the project, opinions were taken from both sides of the consumers using the product. An employee from a franchise that uses a roster based system and an employer from a franchise that user a roster-based system (from two different franchises).

1.3.1.1 Employee – Róisín Bolger – Nandos Franchise (Cashier - 1 Year)

Róisín Bolger has worked as a cashier in Nandos for over a year and was keen to give her opinion on the project. Róisín was asked questions to see what she thought of it and if she would use it. Róisín' response was as follows:

"I love this idea, we are always struggling with remembering when we are working and having it easy to access on the Internet would just make my life so much easier plus being able to contact work people isn't always the easiest so to make that possible would be great."

1.3.1.2 Employer – Laura Murphy – Paddy Power (Manager – 24 Years)

Laura Murphy has worked in the Paddy Power Plc. Company in the busiest shop in Europe for 24 year and has been acting manager for 20 of those years. With Laura being in the company for so long and seeing it both succeed and fail her opinion of the project was highly anticipated. Laura's response was as follows:

"I think that this would be a great idea for larger shops and businesssed to integrate because it would make the lifes of the employees easier and then by assotiation make the employers job easier. The main thing is trying to make it appealing to both because otherwise it won't work."

1.3.2 Online Survey Responses

Using a site called “Survey Monkey” we created a survey to see if the product would appeal to the regular public and just how many of the people surveyed would use it if it came available. The results were a success and really showed peoples opinions of the project. Fifty people answered the survey. These were the results (rounded to the nearest whole number):

Questions	YES	NO
Does your job involve a roster or include shift work?	85%	15%
Would a website in which you could easily see your upcoming rosters appeal to you?	84%	16%
<i>Would a website in which you could easily request days off or shift changes appeal to you?</i>	92%	8%
<i>Would a website in which you could easily chat to other Co-workers appeal to you?</i>	86%	14%

Questions	Extremely Likely	Quite Likely	Moderately Likely	Slightly Likely	Not likely at all
<i>How likely would you be to use this website?</i>	52%	32%	10%	0%	6%
<i>How likely to do you think your place of employment would be to use this website?</i>	26%	30%	32%	2%	10%

1.4 Technologies

The technologies used for the creation of the application are:

PHP – We used PHP to develop the application in order for it to be cloud deployed. Cloud deployment methods are usually a combination of PHP and Git.

HTML – HTML is used to create the altogether look of the application and is the base of the project for without the HTML it would be nothing.

CSS and **Bootstrap** – CSS is linked with the HTML to give the design of the project and to make it look very appealing to users. Bootstrap CSS is used as it is one of the nicest and interactive CSS that was found.

JAVASCRIPT – We used JavaScript to link with the HTML in order to perform the main functionalities of the project.

CLOUD DEPLOYMENT – We deployed the application onto the cloud service Heroku and it is available at shiftscloud.herokuapp.com

FIREBASE – Firebase is an online and cloud based Backend as a Service (Baas) which we used to implement the Chat functionality, the Login and Registration. We also use the Firebase's database, which is a NoSQL cloud database.

1.5 Technical Approach

In regards to the design and implementation of the project, the Iteration Approach was used. Fig 1 shows the Iteration Approach

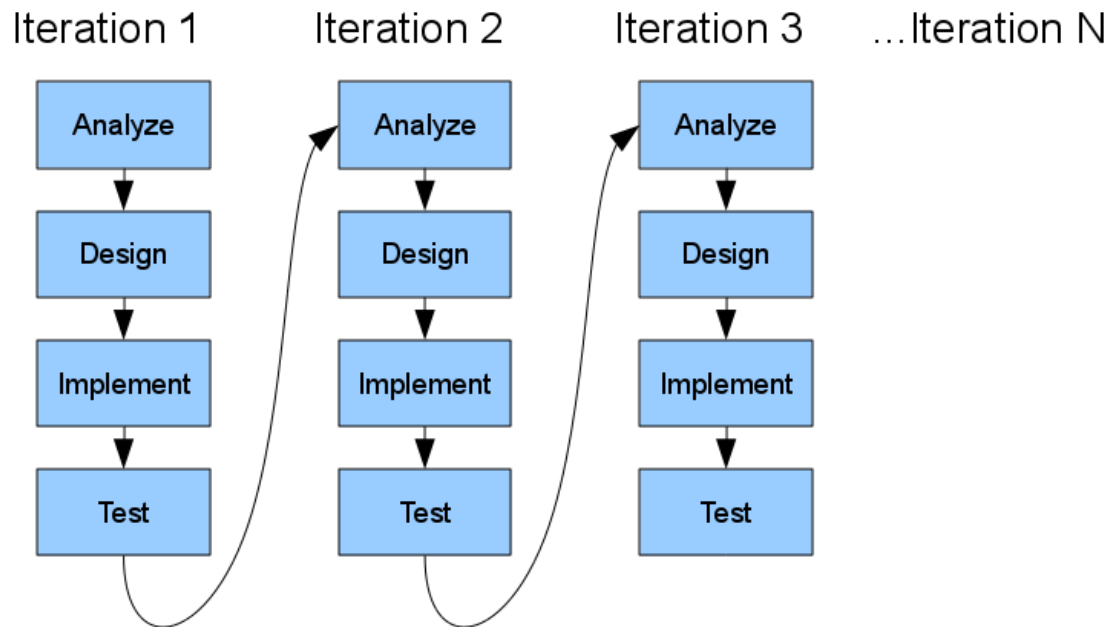


Fig 1. – The Iteration Approach

Development begins by specifying and implementing just part of the software, which can then be reviewed in order to identify further requirements. This process is then repeated, producing a new version of the software for each cycle of the model.

Advantages of the Iteration Approach

- The skeleton of the application is built and then based on that we can swap and change some design aspects as we see nessecary.
- This method can easily spot flaws in the system and be worked on quickly as it is being developed step by step
- When the project is as big as this, it is good to do it in little chunks so that it feels more achievable.

Disadvantages of the Iteration Approach

- A costly design flaw might pop up unannounced if all of the requirements have not been previously specified.

1.6 Structure

This report is structured so that in the first section, the reader can understand what the project is about.

In the second section, the document goes into detail on the background of the project, the main aims of the project, how the customers reacted to the project and the how the project was implemented along with the technologies used.

The third section contains the diagrams which convey the system engineering like use case diagram and the system architecture. Also, in the the third section is the requirements of the system including the 6 functional requirements that are mentioned in detail and the other requirement headings like data, user, environmental and usability requirements. The document then discusses the implementation, testing and what the interface (or GUI) of the system looks like. The third section then includes the User Manual of the project and, finally, in this section, it will look at the evaluation of the system.

The fourth section has a look at the conclusions of the system when it is completed.

Fifth section contains what the futher developments that could be taken to improve or futher on the project.

The sixth section is where all of the references are held that are involved in making the project.

Finally, in the seventh section contains the appendix of the project, this contains the original project proposal, the project plan and the monthly journals that needed to be submitted for the project.

2 System

2.1 System Engineering

2.1.1 Class Diagram

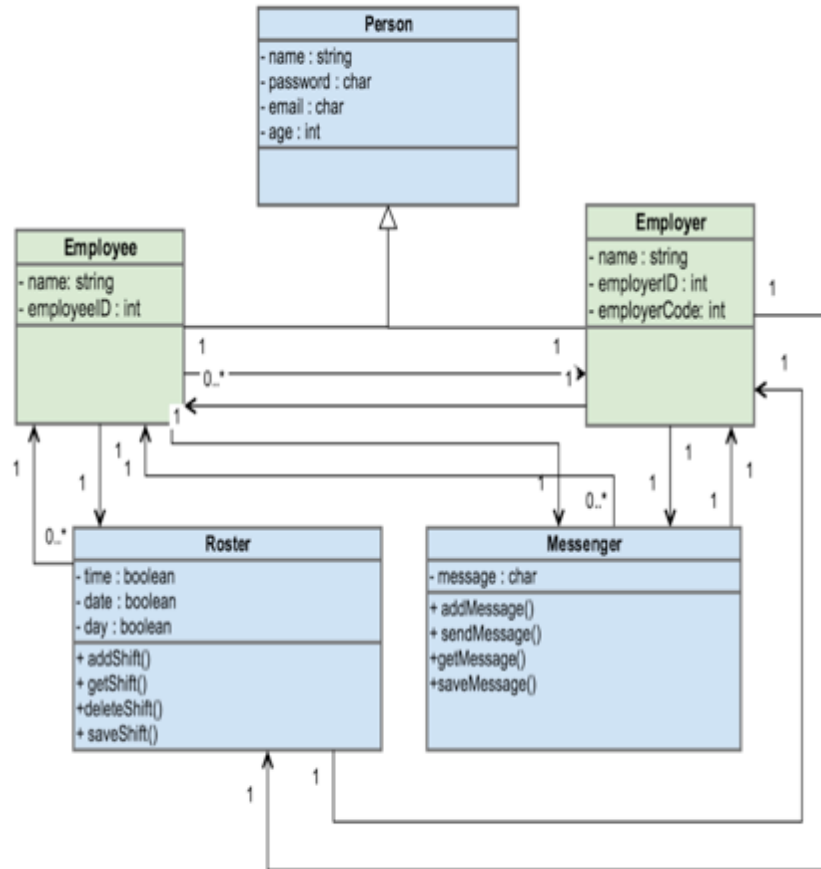


Figure 2.1 – Class Diagram

In Figure 2.1, it can be clearly seen in the diagram, what relationship the parts of the application have between each other and how they can affect it (a roster can have many employees but only one employer)

2.1.2 Component Diagram

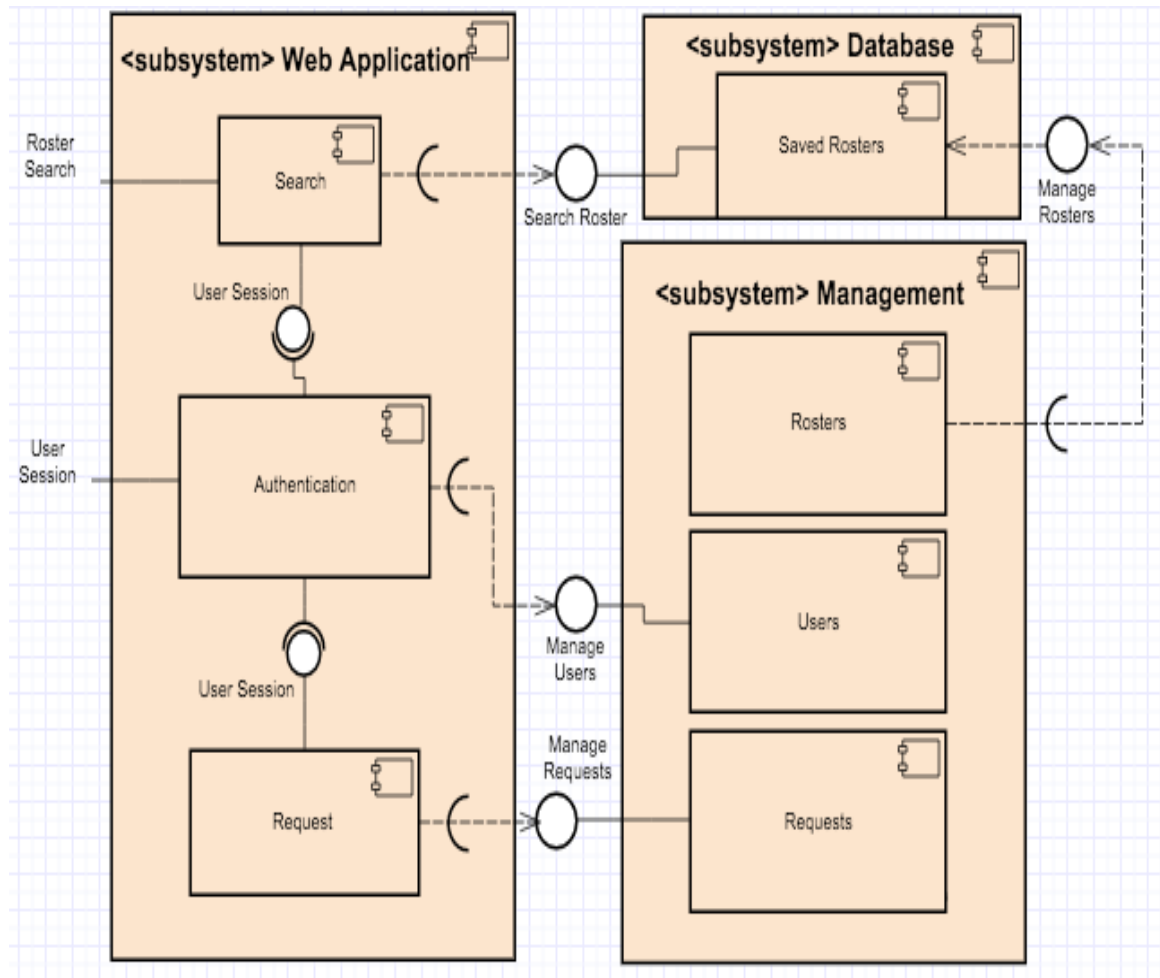


Figure 2.2 – Component Diagram

In Figure 2.2, we can see how the application is composed.

2.1.3 Deployment Diagram

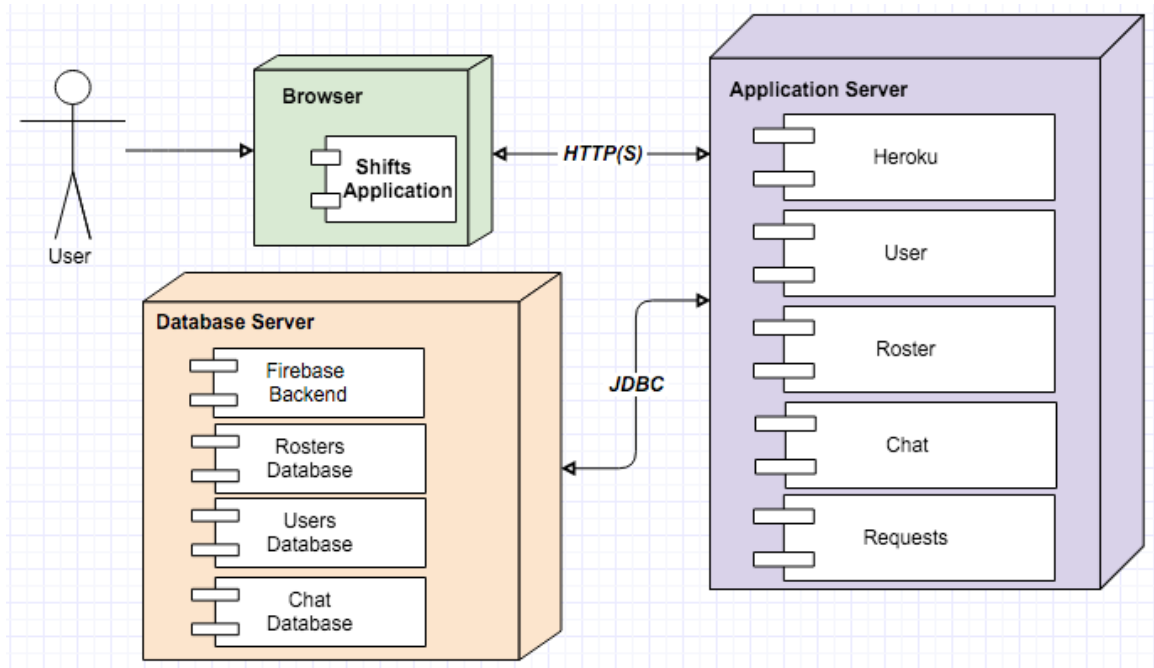
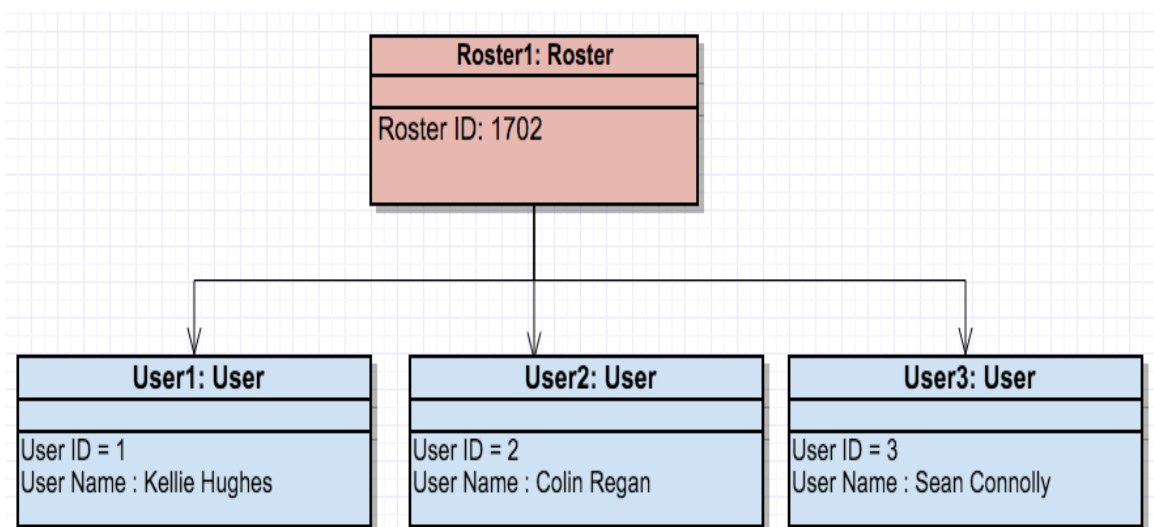


Figure 2.2 – Deployment Diagram

In Figure 2.2, we can see how the application is deployed.

2.1.4 Object Diagram

The object diagram will show the processes involved in the Rosters system.



2.1.5 Package Diagram

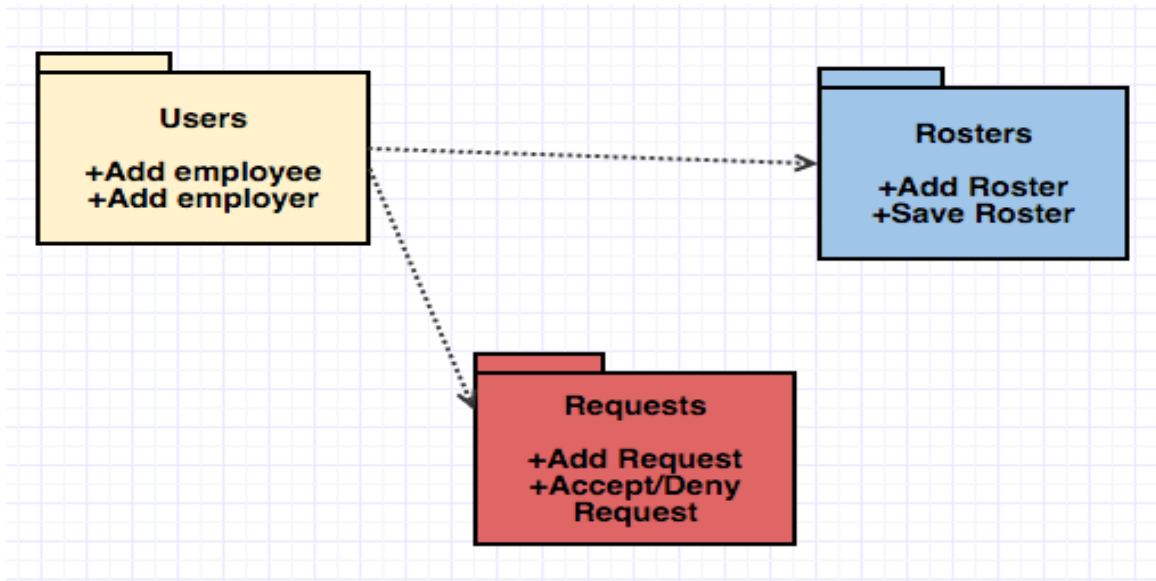


Figure 2.3 – Package Diagram

2.1.6 Structure Diagram

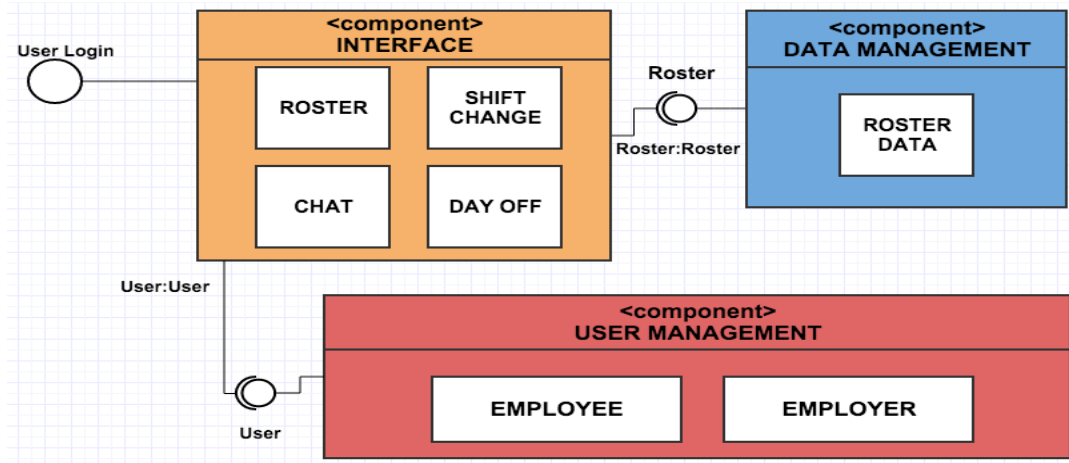


Figure 2.4 – Structure Diagram

2.1.7 Activity Diagram

The activity diagram will show the processes involved in the login of the system.

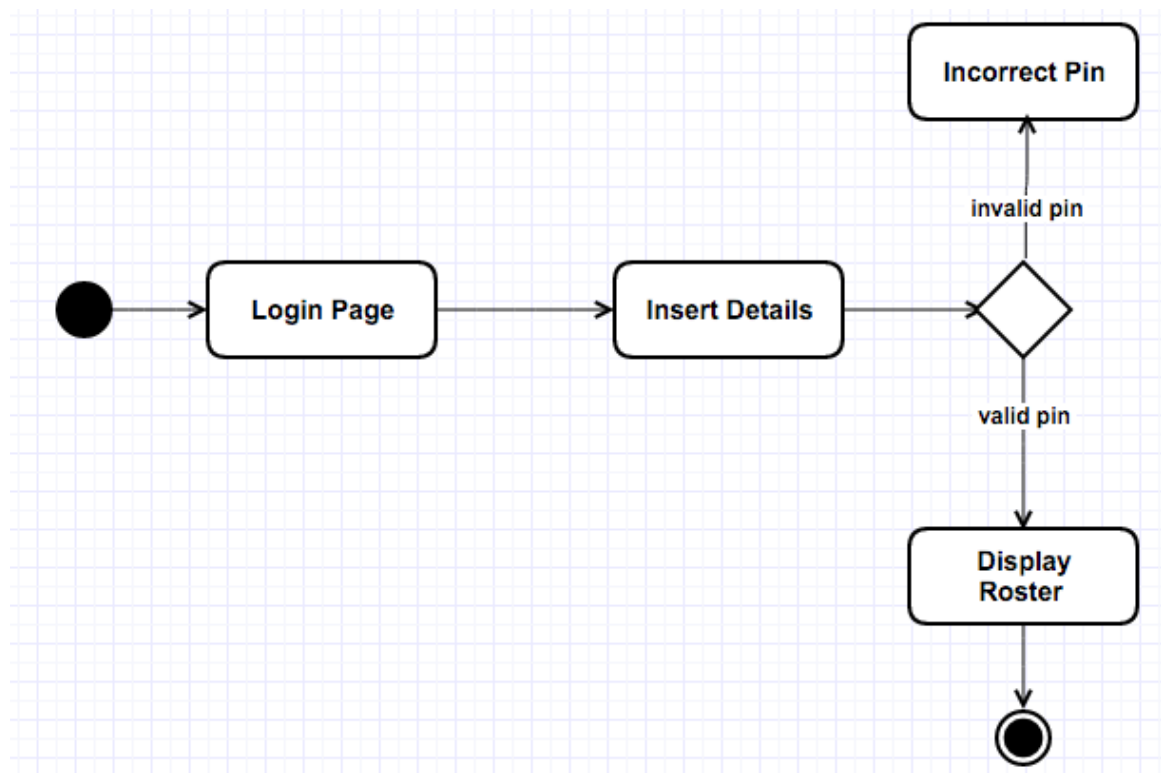


Figure 2.5 – Activity Diagram

In Figure 2.5, we are showing the activity involved in logging in.

2.1.8 Sequence Diagram

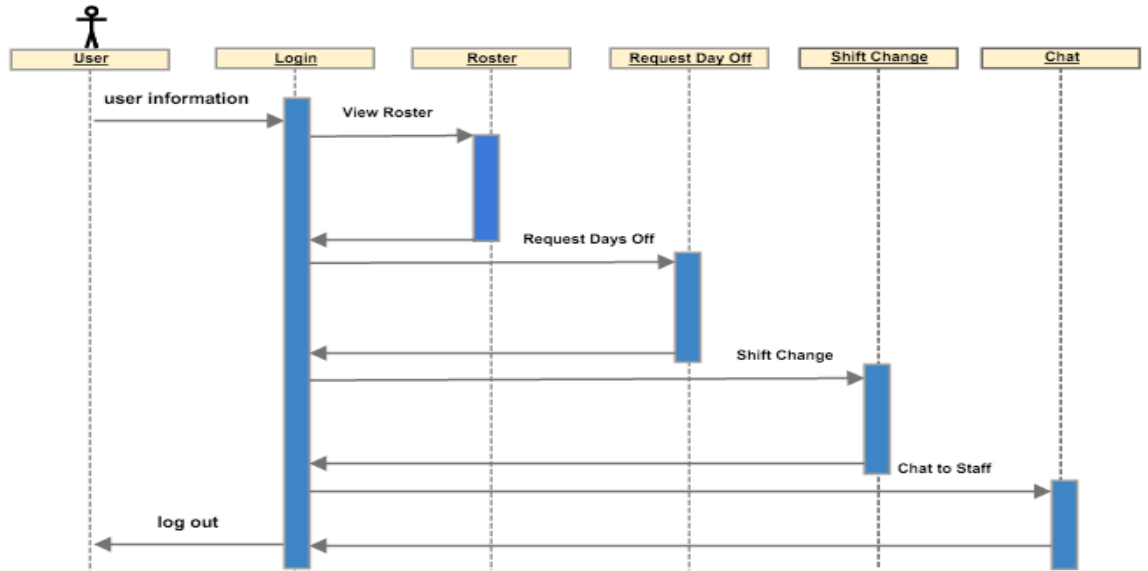


Figure 2.6 – Sequence Diagram

2.1.9 Communication Diagram

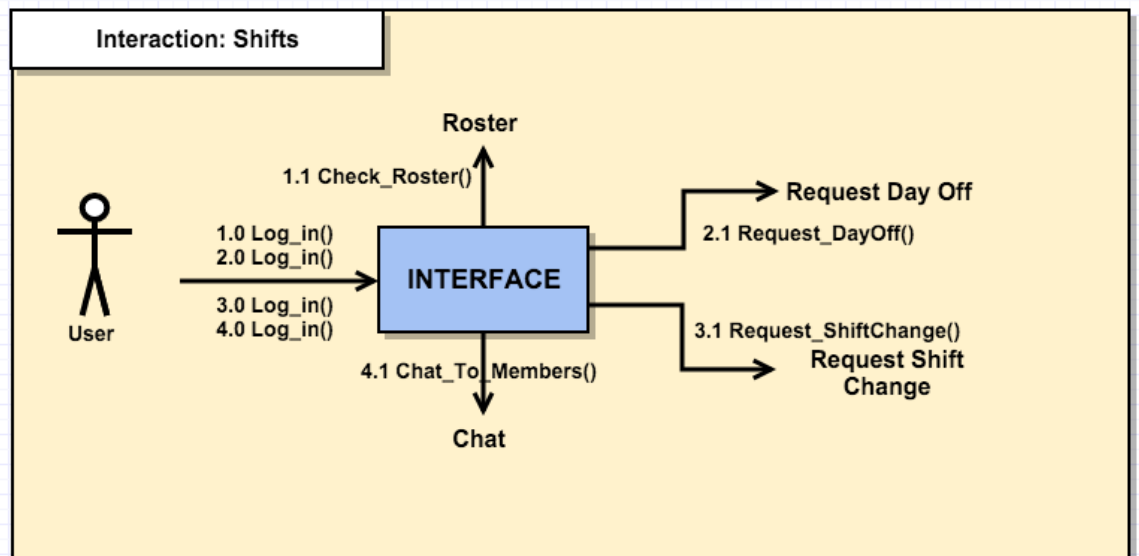


Figure 2.7 – Communication Diagram

2.1.10 Application Architecture

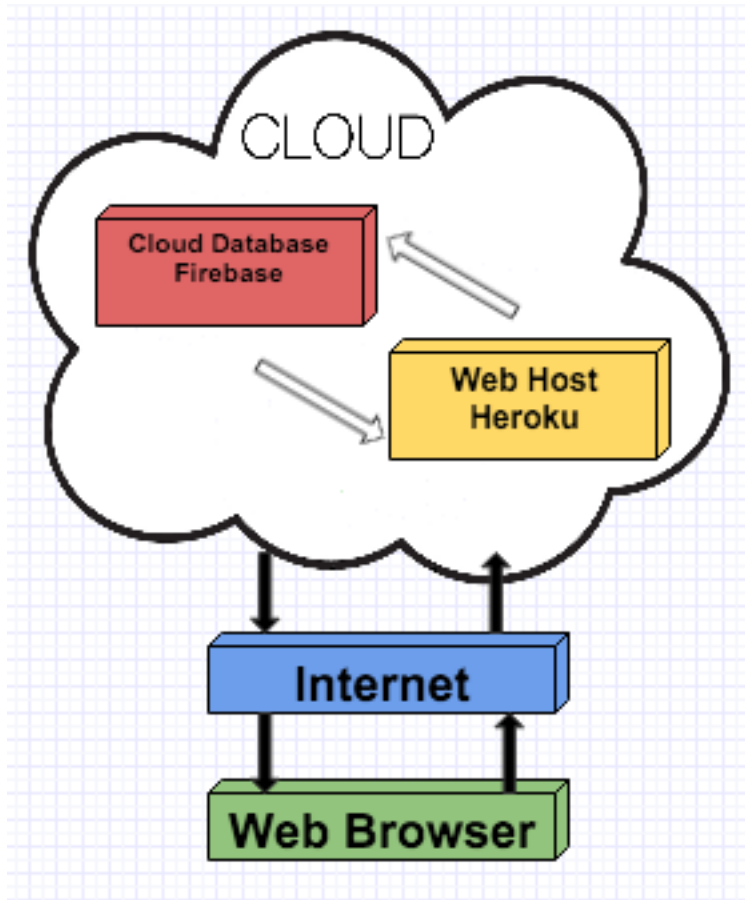


Figure 2.8 – Application Arch Diagram

2.1.11 Use Case Diagram

Below is the Use Case diagram for the application. The diagram shows the ways in which the application will work and all that is involved in it. The numbers beside some parts of the Use Case ranging from 1 to 6 are the main functional requirements. Further on in the document you will see individual use case diagrams for these. (Figure 2.8 – Application Arch Diagram)

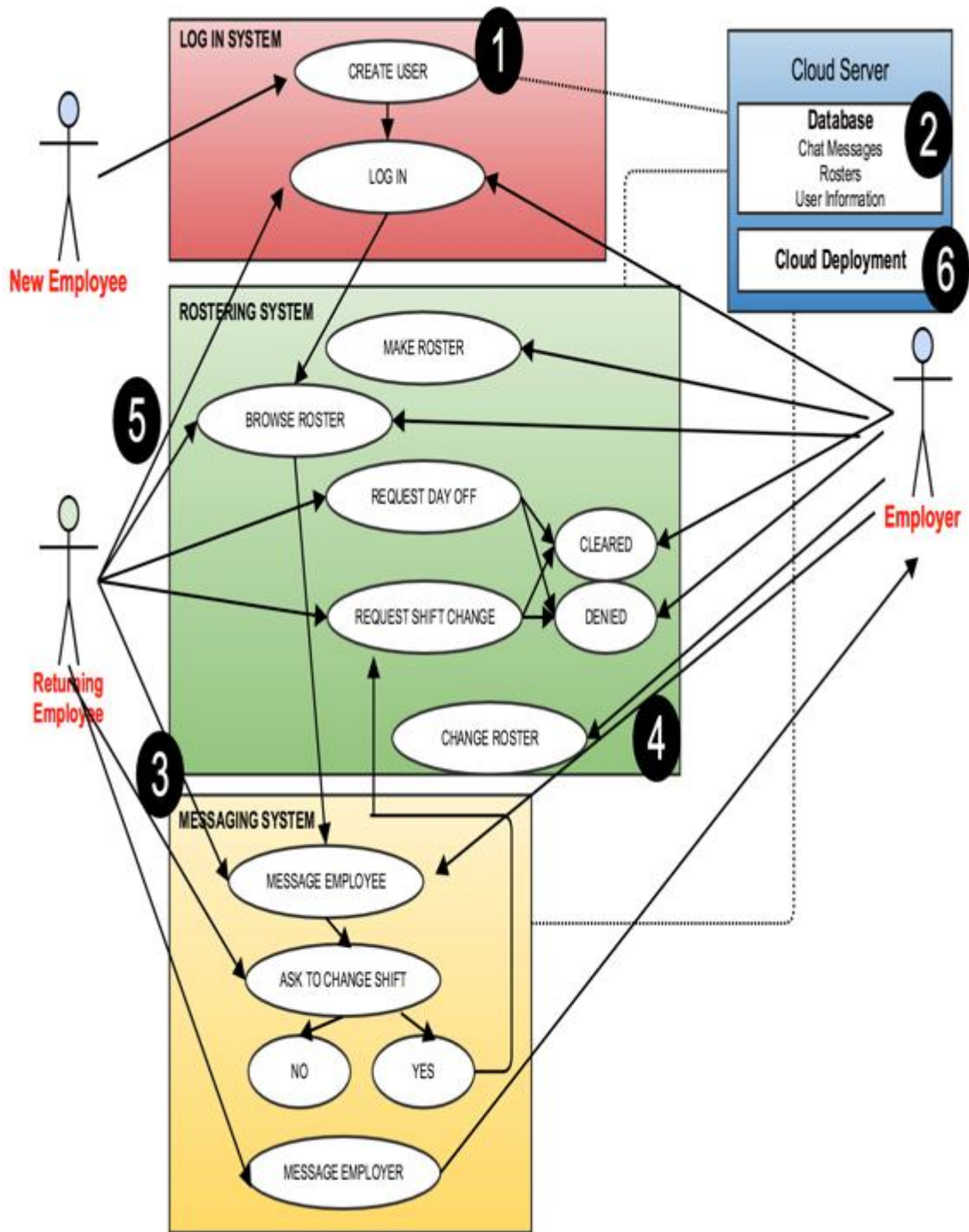


Figure 2.8 – Application Arch Diagram

2.2 Requirements

2.2.1 Functional requirements

2.2.1.1 Requirement 1: User Registration

ID:	Requirement 1: User Registration
Title:	User Registration
Scope:	To be able to create a registration function for new users to log into.
Description:	This is an easy to use system at the start of the website which makes it easy for new users to join. The system needs to take in the input and store it.
Pre-conditions:	<ul style="list-style-type: none">- System must be live- System must be able to take in information.- System must be connected to a database to store it.
Activation	User registration starts when a new employee asks to join the application
Post-conditions:	User registration is only in function when a new member wants to join the application.
Termination:	Once the new user adds all of their info, the system will no longer see this user as a new user and they are free to use all the functions within the system.
Success:	If successful the new user will be able to register
Priority:	High

Code Snippets:

```

function register(email, password){
    console.log("Registered a new User");
    // console.log(email,password);
    var reg = new Firebase ("https://shiftsapp.firebaseio.com");
    reg.createUser ({
        email: email,
        password: password

    }, function(error, userData) {
        if (error) {
            if(error.code)
                alert ("some kind error");
        } else {
            alert ("you registered"+ userData.uid);
        }
    })
}

```

2.2.1.2 Requirement 2: Messages Saving in a Database

ID:	Requirement 2: Messages saving to a Database.
Title:	Message Saving
Scope:	To be able to create a database which can hold messages from the chat function of the application
Description:	This function is the function of making sure the messages from the chat system are saved in the database.
Pre-conditions:	<ul style="list-style-type: none"> - System must be live - System must be able to take in information. - System must be connected to a database to store it. - The user must be logged on. - The message system must be working. - There is messages that need to be saved. - A database has been created.

Activation	The system will save the messages in the database when there is messages that need to be saved.
Post-conditions:	The system will go into a wait state and wait for messages to come in so that they can save and then the process is repeated.
Termination:	The system will stop trying to save the messages to the system once it has completed the action of trying to save it to the system.
Success:	If successful the messages will save to the database.
Priority:	High

Code Snippet:

```

$(function(){
// CREATE A REFERENCE TO FIREBASE
var ref = new Firebase('https://shiftsapp.firebaseio.com/');
var messagesRef = ref.child("messages");

// REGISTER DOM ELEMENTS
var messageField = $('#messageInput');
var nameField = $('#nameInput');
var messageList = $('#example-messages');

// LISTEN FOR KEYPRESS EVENT
messageField.keypress(function (e) {
  if (e.keyCode == 13) {
    //FIELD VALUES
    var username = nameField.val();
    var message = messageField.val();

    //SAVE DATA TO FIREBASE AND EMPTY FIELD

```

```

messagesRef.push({name:username, text:message});

messageField.val('');

}

});

```

2.2.1.3 Requirement 3: Users Messaging System

ID:	Requirement 3: Users Messaging System
Title:	Messaging System
Scope:	To be able to create a messaging system in which the employees from the job can all message each other. The employee should also be able to message the employer.
Description:	This will be a GUI with a build in messaging system and will only be available to users who are signed in. This will make it possible for the employees and employer to message each other.
Pre-conditions:	<ul style="list-style-type: none"> - System must be live - System must be able to take in information. - The messaging system is working - The user is logged on.
Activation	The Messaging system will come into action when the user logs on and proceeds to message another user.
Post-conditions:	The messaging system is only in use when a user wants to message another user.
Termination:	Termination will occur when the user does not need to message another user anymore.
Success:	If successful the new user will be able to register
Priority:	High

2.2.1.4 Requirement 4: Management Controls

ID:	Requirement 4: Management Controls
Title:	Management Controls
Scope:	To be able to create pages in which only the employers have access to.
Description:	There will be pages in which only the employer can have access to. These pages include the new roster page in and the requests for time off and shift change accept or deny page. These need to be only accessible by certain users otherwise everyone could choose their own rosters.
Pre-conditions:	<ul style="list-style-type: none">- System must be live- System must be able to take in information.- The messaging system is working- The user is logged on.- System must be able to differentiate between the type of users accessing the rosters.
Activation	Activation should be automatic when the user creates a registration account. At registration the system should be giving the users in question certain capabilities.
Post-conditions:	This function is in use when the employer is logged on.
Termination:	This function will terminate when the employer logs out.
Success:	If successful the employer should be the only person who has access to the restricted pages.
Priority:	High

Code Snippet:

```
function managerlogin(email, password) {
```

```

console.log("Registering with"+email+" "+password);

var reg = new Firebase ("https://shiftsapp.firebaseio.com");

reg.authWithPassword({
  email: email,
  password: password
}, function(error, user){
  if(error){
    console.log(error);
    if(error.code == "INVALID_USER"){
      alert("Not a valid login")
    }
    if(error.code == "INVALID_PASSWORD"){
      alert("Not a valid password");
    }
    alert(error.message);

  }else{
    alert("Logged in with "+user.uid);
    window.location.href = "newrosters.php";
  }
})
}

```

2.2.1.5 Requirement 5: Registered Staff systems

ID:	Requirement 5: Registered Staff Systems
Title:	Registered Staff

Scope:	To be able to create a system that is only available to people that are part of that organisation or business.
Description:	The system should take new users looking to register and during this process be able to assign them to the place of employment in which they fit. The system should also block them from access any other streams in the progress.
Pre-conditions:	<ul style="list-style-type: none"> - System must be live - System must be able to take in information. - The stream in which the user needs to go into must be a business that uses the application.
Activation	This will come into activation when the users are registering with the system.
Post-conditions:	This system will be in constant use once the streams begin as to make sure nobody else has access to another stream.
Termination:	This does not terminate while the application is still live as it a security function and needs to make sure that it cannot be breached easily.
Success:	If successful only the people in that business will have access to the stream that they are in.
Priority:	High

2.2.1.6 Requirement 6: Foot Traffic

ID:	Requirement 6: Foot Traffic
Title:	Foot Traffic Control

Scope:	To be able to create a web application that is hosted on the cloud and has some more cloud functionality to be able to host the amount of traffic that it is going to receive.
Description:	The system needs to be able to notice how much foot traffic it is getting and be able to react accordingly so that the system does not go down.
Pre-conditions:	- System must be live
Activation	This should be in constant effect.
Post-conditions:	This is only in effect when the system is live. Hopefully this post-condition will never come into effect as it will mean the site has gone down.
Termination:	This is terminated when the site is no longer alive.
Success:	If successful the site should be able to withstand the amount of foot traffic that it gets and reacts accordingly
Priority:	High

2.2.2 Data requirements

Back-Up & Recover	The data should have a back up and recovery plan for if ever anything goes wrong.
Security Requirement	The data should be safely secured to keep hackers away from it.
Data Reusability	The data in the system that is saved in the database should be reusable.
Data Integrity	The integrity of the data should stay intact.
Data Reliability	The data should be reliable and safe without the fear of it being lost or tampered with.

2.2.3 User requirements

The system requirements for the user is the major part of the project for if the user or users is not happy with how the application works they will be very hesitant to use it as a product.

Log In/Register	Once a company is set up in the system a new user should be able to just sign up and use the system straight away. It should also be clear and easy for returning users to be able to log in and see the roster or chat with other users from your job. This is a major factor as if it is not easy to log in the system will not be used. Clients need something to be easy to use.
View	Clients should be able to clearly read what is on the UI and be able to decipher what is happening on the page.
Chat System	While logged in the clients should be able to chat with other member of staff. This should be a simple process.
Accessibility	As it being a web application the system should be able to hold a lot of foot traffic at the one time because if it is not able to handle lots of people being on the page at the one time then it won't be a very good website.
Security	With log in details and information being stored about them in a database they need to be confident in knowing that their information is safely stored.

2.2.4 Environmental requirements

Portability	From an environmental prospective the application should be portable as to limit any unneeded machines. This is also in use in this application as it is all cloud based.
Reusability	The application and all the information inside of the application should be reusable as to not make internet clutter or dirt.

2.2.5 Usability requirements

Performance/Response Time	The application should have good performance and response time as a slow response time could lead to less foot traffic.
Easy to Navigate	The application should be easy to navigate
Availability requirement	The application should be available quick and should be ready to react to commands.

2.3 Implementation

2.3.1 Technologies

PHP, HTML and CSS

PHP, HTML and CSS is used to make the base design of the application and is the framework in which to work around to achieve maximum results.

PHP is used, as it is the most commonly used language for Cloud Deployment.

HTML made the basic design of the application and created all the stylings.

Finally, CSS combined with Bootstrap made the application sleek and sophisticated.

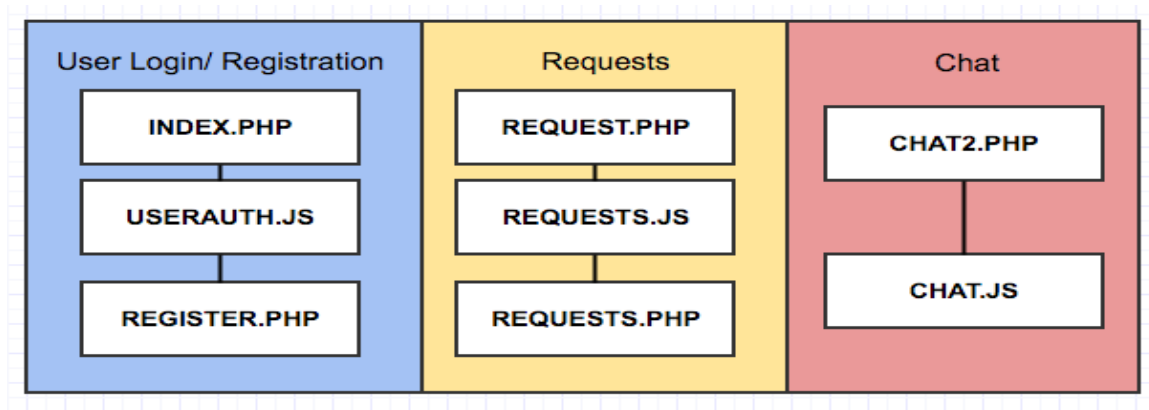
Firestore

We use Firestore, a cloud based Backend as a Service, as the backend for our system. We use Firestore' database, a NoSQL database, in our application, to stores all of the employee logins, the rosters, the requests and the chat system messages. In 2.3.2, we explain how Firestore is implemented into our system.

JavaScript

JavaScript is used to implement the functionalities of the application. These functions include user log in, user registration, saving data, chat message display. JavaScript is a key functionality and most pages (as you will see below) are attached to a JavaScript file.

2.3.2 Implementation of Functions



Login Functionality

For the login functionality the files used are index.php and userauth.js

Index.php – form created in the PHP file which is linked to the userauth.js file called “final login”

```

<form action="" id="finallogin">
  <header>
    <h2><font color="white">Shifts Rostering System</font></h2>
  </header>
  <div>
    <label class="labelStyle" id="logintitle1" for="loginField1"><font color="white">Login Email:</font></label>
  </div>
  <input id="finalloginInput" name="loginField1" type="text" value="" tabindex="1" placeholder="enter email address">
  </div>
  <div>
    <label class="labelStyle" id="logintitle2" for="loginField2"><font color="white">Password:</font></label>
  </div>
  <input id="finalpwField" name="loginField2" type="password" value="" tabindex="2" placeholder="enter password">
  </div>
  <div>
    <input id="finalloginForm" name="registerForm" type="submit" value="Login" class="rosterclicks">
  </div>
</form>

```

userauth.js – in this file, firebase must be referenced and then the functions for the finallogin can be put into place.

```

////CREATE FIREBASE CONNECTION
var ref = new Firebase('https://shiftsapp.firebaseio.com/');

```

```

// for the login //
function login(email, password) {
  console.log("Registering with"+email+" "+password);
  var reg = new Firebase ("https://shiftsapp.firebaseio.com");

  reg.authWithPassword({
    email: email,
    password: password
  }, function(error, user){
    if(error){
      console.log(error);
      if(error.code == "INVALID_USER"){
        alert("Not a valid login")
      }
      if(error.code == "INVALID_PASSWORD"){
        alert("Not a valid password");
      }
      alert(error.message);
    }else{
      alert("Logged in with "+user.uid);
      window.location.href = "roster2401.php";
    }
  })
}
}

```

Here we are getting the email and password from the user and checking that it is a valid email address. If the email and password correct the application will redirect to the next page, if now the application will throw up an error message.

Registration Functionality

For the registration functionality the files used are registration.php and userauth.js

Register.php – form created in the php file which is linked to the userauth.js file called “login”

```

<form action="" id="login">
  <header>
    <h2><font color="white">Register New Employees</font></h2>
  </header>
  <div>
    <label class="labelStyle" id="logintitle1" for="loginField1"><font color="white">Login Email:</font></label>
    <div>
      <input id="loginInput" name="loginField1" type="text" value="" tabindex="1" placeholder="email address">
    </div>
  </div>
  <div>
    <label class="labelStyle" id="logintitle2" for="loginField2"><font color="white">Password:</font></label>
    <div>
      <input id="pwField" name="loginField2" type="password" value="" tabindex="2" placeholder="password">
    </div>
  </div>
  <div />
  <div>
    <input id="registerForm" name="registerForm" type="submit" value="Register" class="rosterclicks">
  </div>
</form>

```

userauth.js – in this file, firebase must be referenced and then the functions for the login can be put into place.

```

////CREATE FIREBASE CONNECTION
var ref = new Firebase('https://shiftsapp.firebaseio.com/');

```

Once the connectivity with firebase is formed the application will find the information you have entered and create the user for these credentials. From there the user is able to use the services on the application.

```

function register(email, password){
  console.log("Registered a new User");
  // console.log(email,password);
  var reg = new Firebase ("https://shiftsapp.firebaseio.com");
  reg.createUser ({
    email: email,
    password: password

  }, function(error, userData) {
    if (error) {
      if(error.code)
        alert ("some kind error");
    } else {
      alert ("you registered"+ userData.uid);
    }
  })
}

```

Roster Functionality

For new rosters the files used are the newrosters.php and rosterjava.js

The employer of the company creates new rosters and then they are displayed to the employee section of the application.

```

<tr>
  <td class="tg-baqh" id="Emp1"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter shift" class="form-control" id="emp1Input1"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter shift" class="form-control" id="emp1Input2"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter shift" class="form-control" id="emp1Input3"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter shift" class="form-control" id="emp1Input4"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter shift" class="form-control" id="emp1Input5"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter shift" class="form-control" id="emp1Input6"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter shift" class="form-control" id="emp1Input7"></td>
</tr>

```

In the viewing page of the rosters the database is being references and the information is being pulled from the table.

```

<tr>
  <th class="tg-jlrw">Name</th>
  <th class="tg-yw4l"><input type="text" placeholder="enter date" class="form-control" id="date1Input"></th>
  <th class="tg-yw4l"><input type="text" placeholder="enter date" class="form-control" id="date2Input"></th>
  <th class="tg-yw4l"><input type="text" placeholder="enter date" class="form-control" id="date3Input"></th>
  <th class="tg-yw4l"><input type="text" placeholder="enter date" class="form-control" id="date4Input"></th>
  <th class="tg-yw4l"><input type="text" placeholder="enter date" class="form-control" id="date5Input"></th>
  <th class="tg-yw4l"><input type="text" placeholder="enter date" class="form-control" id="date6Input"></th>
  <th class="tg-yw4l"><input type="text" placeholder="enter date" class="form-control" id="date7Input"></th>
</tr>

```

The dates are also being pulled from the date's table in the database.

```

<tr>
  <td class="tg-baqh">Type Enter</td>
  <td class="tg-yw4l"><input type="text" placeholder="enter" class="form-control" id="enter1"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter" class="form-control" id="enter2"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter" class="form-control" id="enter3"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter" class="form-control" id="enter4"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter" class="form-control" id="enter5"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter" class="form-control" id="enter6"></td>
  <td class="tg-yw4l"><input type="text" placeholder="enter" class="form-control" id="enter7"></td>
</tr>

```

When the employer is finished entering in the rosters typing enters into the box will save it into a table. This means that the table is submitted however if the employee wants to change it all they have to do is change it and press enter.

```

$(function Emp1(){
  // Get a database reference to our posts
  var employeeref = new Firebase("https://shiftsapp.firebaseio.com/employees/emp1");

  // Attach an asynchronous callback to read the data at our posts reference
  employeeref.on("value", function(snapshot) {
    console.log(snapshot.val());
    $('#Emp1').html(snapshot.val());
  }, function (errorObject) {
    console.log("The read failed: " + errorObject.code);
  });
});

```

This snippet of code pulls the information from the table of

employees and outputs the first employee.

This snippet of code receives the information from the user and then stores it under the date that they have specified once they have pressed enter. This information is then easily updated once the employer decides to change it again. This function carried out 7 times. One for every day of the week.


```

$(function Monday){
// CREATE A REFERENCE TO FIREBASE
var dateMondayRef = new Firebase('https://shiftsapp.firebaseio.com/roster');

// REGISTER DOM ELEMENTS
var date1Field = $('#date1Input');
var emp1put1Field = $('#emp1Input1');
var emp2put1Field = $('#emp2Input1');
var emp3put1Field = $('#emp3Input1');
var emp4put1Field = $('#emp4Input1');
var emp5put1Field = $('#emp5Input1');
var enter1Field = $('#enter1');

// LISTEN FOR KEYPRESS EVENT
enter1Field.keypress(function (e) {
  if (e.keyCode == 13) {
    //FIELD VALUES
    var dateMonday = date1Field.val();
    var emp1put1 = emp1put1Field.val();
    var emp2put1 = emp2put1Field.val();
    var emp3put1 = emp3put1Field.val();
    var emp4put1 = emp4put1Field.val();
    var emp5put1 = emp5put1Field.val();
    var enter1 = enter1Field.val();

```

```

//SAVE DATA TO FIREBASE AND EMPTY FIELD
var obj1 = {};
obj1[dateMonday] = {
  emp1:emp1put1,
  emp2:emp2put1,
  emp3:emp3put1,
  emp4:emp4put1,
  emp5:emp5put1
}

dateMondayRef.child(dateMonday).update({
  emp1:emp1put1,
  emp2:emp2put1,
  emp3:emp3put1,
  emp4:emp4put1,
  emp5:emp5put1});
enter1Field.val('');
}
});

```

The dates are then passed out to the roster sheet in question and the rosters in question are also outputted.

```

$(window.retrieveRoster = function () {
  var url = "https://shiftsapp.firebaseio.com/roster/";

  rosterdate = computeDate(0);
  var day1;
  var datapull = new Firebase(url.concat(rosterdate));
  datapull.on("value", function(snapshot) {
    console.log(snapshot.val());
    console.log(datapull);
    day1 = snapshot.val();
    console.log(day1);
    $('#datapull').html(snapshot.val());
  }, function(errorObject) {
    console.log("The read failed: " + errorObject.code);
  });
});

```

```

$(window.displayRoster = function (arrayRoster, dayCode) {
  var arrayRoster = arguments[0];
  var dayCode = arguments[1];
  if(arrayRoster != null)
  {
    console.log("arrayRoster");
    console.log(arrayRoster.emp1);
    id1 = '#emp1'.concat(dayCode);
    $(id1).html(arrayRoster.emp1);

    console.log(arrayRoster.emp2);
    id2 = '#emp2'.concat(dayCode);
    $(id2).html(arrayRoster.emp2);

    console.log(arrayRoster.emp3);
    id3 = '#emp3'.concat(dayCode);
    $(id3).html(arrayRoster.emp3);

    console.log(arrayRoster.emp4);
    id4 = '#emp4'.concat(dayCode);
    $(id4).html(arrayRoster.emp4);

    console.log(arrayRoster.emp5);
    id5 = '#emp5'.concat(dayCode);
    $(id5).html(arrayRoster.emp5);
  }
});

```

```

$(window.computeDate = function (numberOfDays) {
  //console.log("Hello World");
  var d = new Date(rosterdate.getFullYear(), rosterdate.getMonth(),
  //console.log(rosterdate.getDate());
  //console.log(rosterdate);
  //console.log(d);
  //console.log(numberOfDays);
  var numberOfDays = arguments[0];
  d.setDate(d.getDate() + numberOfDays);

  //console.log(d);
  rdate = d.toISOString();
  var i = rdate.indexOf("T");
  rdate = rdate.substring(0, i);
  id = "#date".concat(numberOfDays);
  $(id).html(rdate);
  //console.log(d);
  //console.log(rdate);
  return rdate;
});

```

Chat Functionality

For the chat functionality the files used are chat2.php and chatjava.js

Chat2.php – a div is created in the file to create the interface for the chat window.

```
<h1><font color="white">Message Members of Staff</font></h1>
<div id="chatwindow">
  <label for="nameInput"><font color="white">Name:</font></label>
  <input id='nameInput' placeholder='enter your name' type='text'>
  <div id="messagewindow">
    <ul class="example-chat-messages" id='example-messages'></ul>
  </div><label><font color="white">Message:</font></label> <input id=
  'messageInput' placeholder='Type a message...' type='text'>
</div>
```

chatjava.js – in the JavaScript file we must link the firebase application and create a child to neatly store the messages in.

```
// CREATE A REFERENCE TO FIREBASE
var ref = new Firebase('https://shiftsapp.firebaseio.com/');
var messagesRef = ref.child("messages");
```

We then give the details some variables and make a function to allow the system to listen to a key press.

From here we can then save the data to the database ready to be outputted.

```
// REGISTER DOM ELEMENTS
var messageField = $('#messageInput');
var nameField = $('#nameInput');
var messageList = $('#example-messages');

// LISTEN FOR KEYPRESS EVENT
messageField.keypress(function (e) {
  if (e.keyCode == 13) {
    //FIELD VALUES
    var username = nameField.val();
    var message = messageField.val();

    //SAVE DATA TO FIREBASE AND EMPTY FIELD
    messagesRef.push({name:username, text:message});
    messageField.val('');
  }
});
```

```
//GET DATA
var data = snapshot.val();
var username = data.name || "anonymous";
var message = data.text;
```

Requests Functionality

For the request functionality the files used are request.php, requests.php and requests.js

Request.php – a div is created to create the interface for the request application.

```
<h1>Submit a Request</h1>
<div id="chatwindow">
  <label for="nameInput"><font color="white">Name:</font></label>
  <input id="nameInput" placeholder="enter your name" type="text"></br>
  <label><font color="white">Type of Request:</font></label> <input id=
  'typeInput' placeholder="Type a request" type="text"></br>
  <label><font color="white">Reason for Request:</font></label></br>
  <input id=
  'requestInput' placeholder="Type a message and then press enter" type="text" style="height:200px;width:400px;font-size:14pt;">
</div>
```

requests.js - in the JavaScript file we must link the firebase application and create a child to neatly store the requests in.

```
// CREATE A REFERENCE TO FIREBASE
var ref = new Firebase('https://shiftsapp.firebaseio.com/');
var requestRef = ref.child("request");
```

```
// REGISTER DOM ELEMENTS
var requestField = $('#requestInput');
var nameField = $('#nameInput');
var typeField = $('#typeInput');
var requestList = $('#example-messages');

// LISTEN FOR KEYPRESS EVENT
requestField.keypress(function (e) {
  if (e.keyCode == 13) {
    alert ("You have submitted a request");
    window.location.href = "request.php";
    //FIELD VALUES
    var username = nameField.val();
    var request = requestField.val();
    var type = typeField.val();

    //SAVE DATA TO FIREBASE AND EMPTY FIELD
    requestRef.push({name:username, message:request, type:type});
    requestField.val('');
  }
});
```

We give the details some variables and then listen for a key press from the user. The variable details are then stored in the database and when they are called, will be outputted to the requests.php.

```
// Add a callback that is triggered for each chat message.
requestRef.limitToLast(100).on('child_added', function (snapshot) {
  //GET DATA
  var data = snapshot.val();
  var username = data.name || "anonymous";
  var request = data.message;
  var type = data.type;
```

Cloud Hosting - Deployment to Heroku

2.3.3 Cloud Hosting - Deployment to Heroku.

We deployed Shifts on Heroku, a cloud Platform as a Service.

The application is available at: <https://shiftscloud.herokuapp.com/>

In order to deploy the application to Heroku, the files needed to be added to GitHub. This was also a great way of keeping track of version control.

Deploying to GitHub – commands.

```
git init
git add README.md
git commit -m "first commit"
git remote add origin https://github.com/hereskellie/shiftscloud.git
git push -u origin master
```

From this code you can then use the Heroku deployment functions and search for the repository you would like to use.

2.3.4 Backend as a Service – Firebase

The information from the application is stored on a Backend as a Service called Firebase. Firebase stores the database as JSON objects. This is cloud based, adding to the specialization of the project.

Firebase Link: <https://shiftsapp.firebaseio.com/>

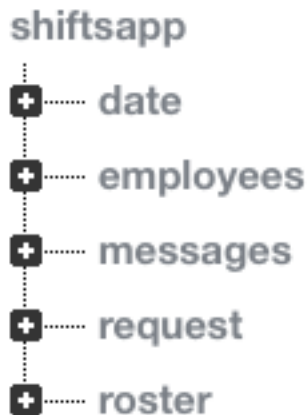


Fig 3.4 all of the tables within the Firebase database

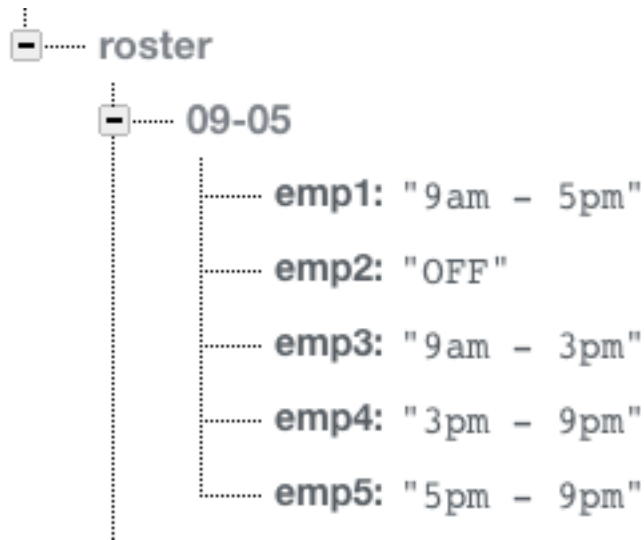


Fig 3.5 – an example of a roster input



Fig 3.6 – an example of employee table

As previously mentioned, Firebase must be linked in the applications JavaScript files.

2.4 Testing

To test the application was running at the best of its ability and making sure that there was no major errors in the coding the following test were ran.

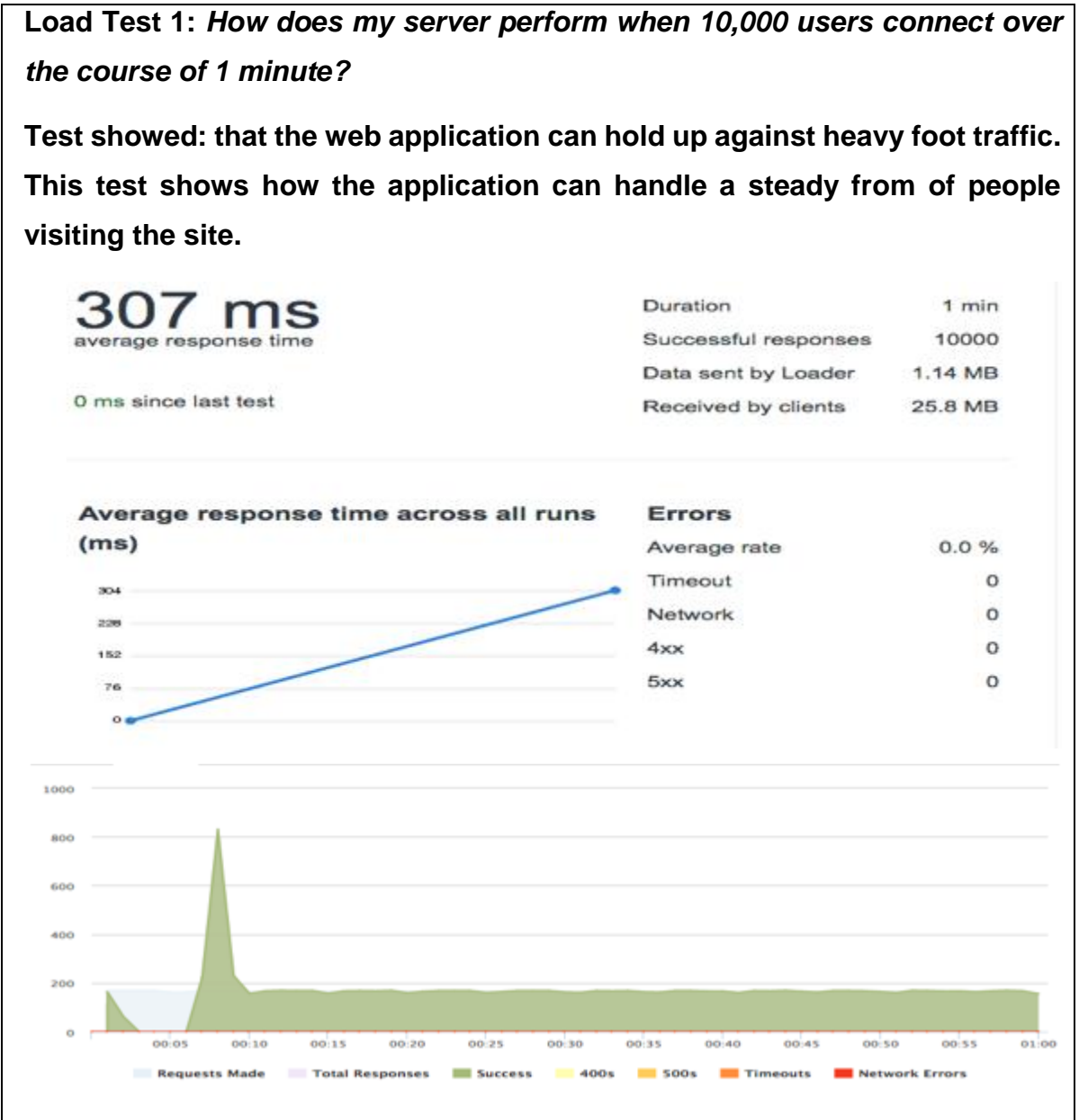
2.4.1 Load and Stress Testing

To test how much foot traffic and load data the system could take, we ran a load and stress test using Loader.io. Loader.io was an added add-on on Heroku that

allowed me to run load tests to see how well the system was reacting. A stress test was also carried out to see how far the system could be pushed before it broke.

Results of Load/Stress Testing:

A number of tests and a number of different scenarios were tested for Load and Stress Testing.



Load Test 2: How does my server perform over a 1 minute period when there is a constant load of 0 to 1000 clients connected?

Test showed: the server performed well and only had an error rate of 0.01% throughout the whole test and maintained a good average response time.

217 ms
average response time

0 ms since last test

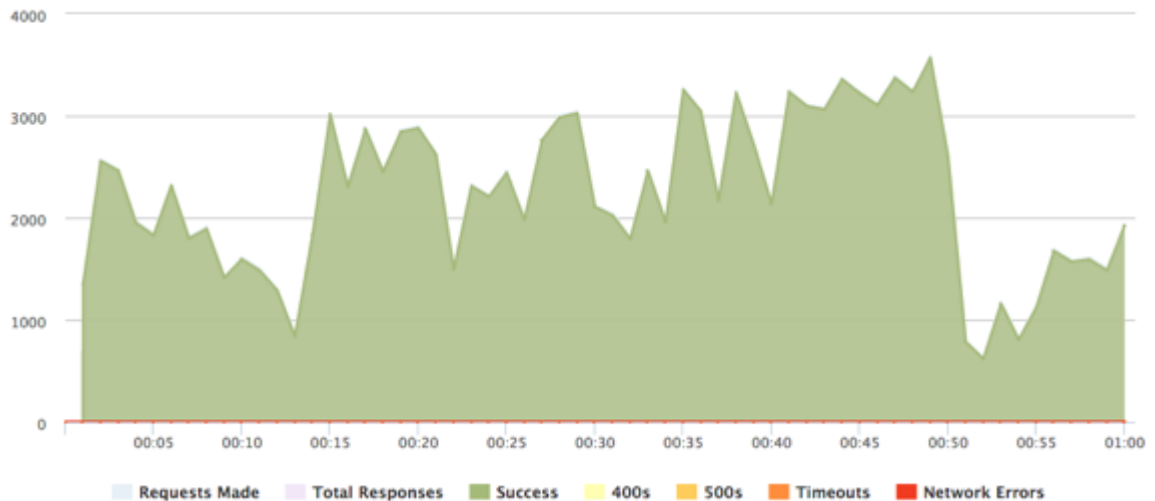
Duration	1 min
Successful responses	134318
Data sent by Loader	15.5 MB
Received by clients	346 MB

Average response time across all runs (ms)



Errors

Average rate	0.01 %
Timeout	7
Network	0
4xx	0
5xx	0



Stress Test 1: How does my server perform over a 30 second period when there is a constant load of 10000 clients connected?

Test showed: Immediately crashed with a 95.23% error rate – could not handle 10000 clients. The test crashed so quickly because the application could not handle 10,000 clients all at once.

147 ms
average response time

0 ms since last test

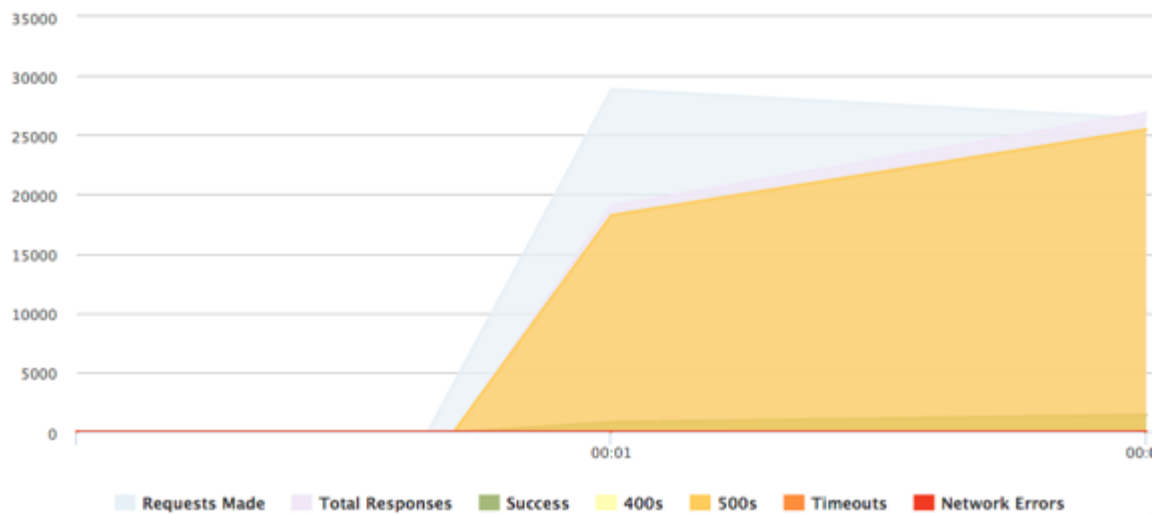
Duration	30 sec
Successful responses	2191
Data sent by Loader	6.44 MB
Received by clients	34.6 MB

Average response time across all runs (ms)



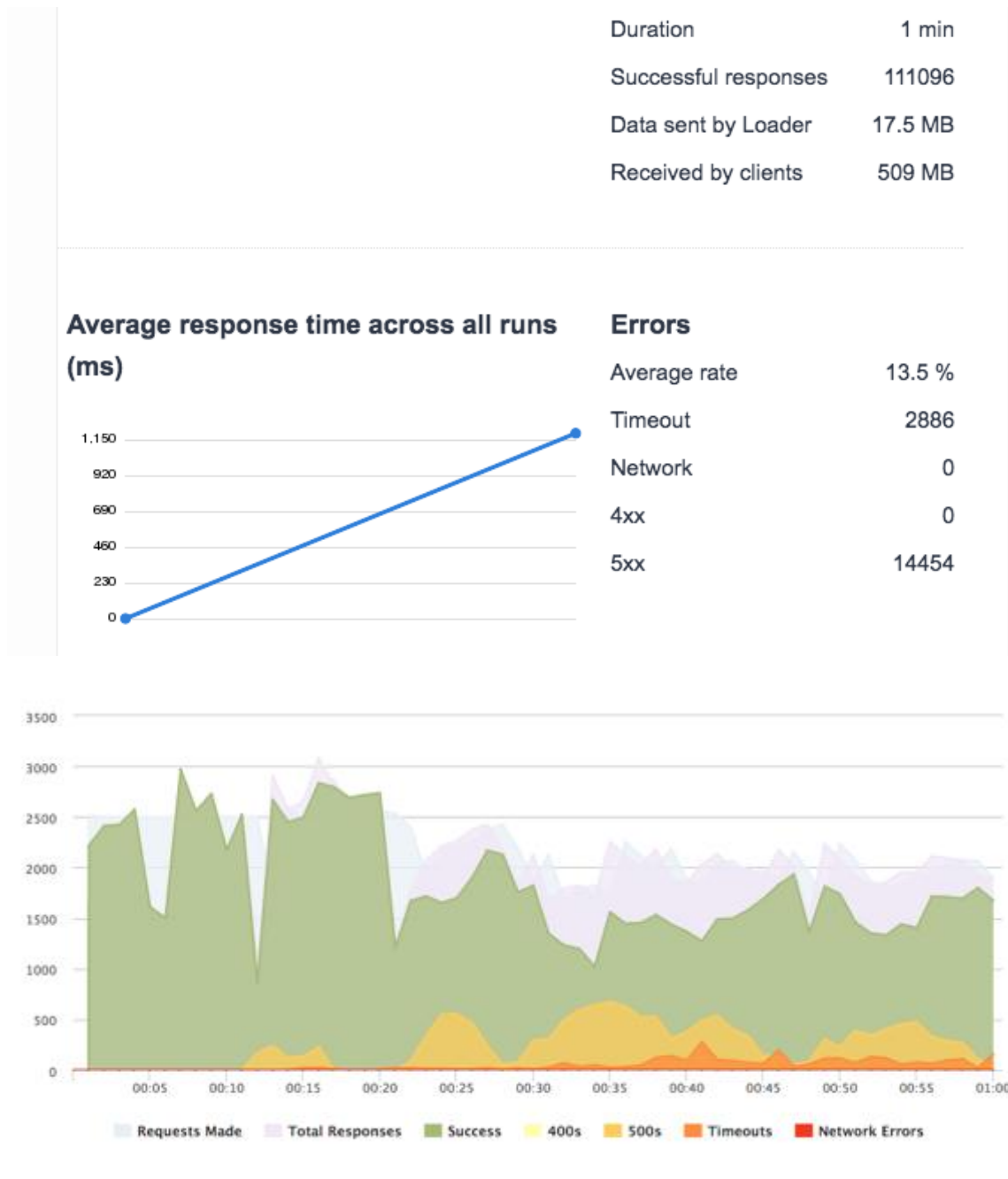
Errors

Average rate	95.23 %
Timeout	0
Network	0
4xx	0
5xx	43718



Stress Test 2: How does my server perform when 2500 users connect every second over a 1 minute period?

Test showed: this was a big ask for the server, it handled it well although average response times were longer than usual the error rate was in around the 13% mark.



2.4.2 Unit Testing

Unit testing was ran to make sure that all the code was giving the desired outcome, for this an application called Jasmine was used which is used to test JavaScript code.

Results of the Unit Testing:

To see the results of the unit testing, the files are available in the source code on github at: <https://github.com/hereskellie/ShiftsFinal>

In here the testing software is found. In order to reveal the test results, one must open the testing folder and run the SpecRunner.html file and it will open up in your browser as follows:

2.4.3 Customer Testing

We decided to use the SUS (System Usability Scale) for customer testing, the System Usability Scale is one of the most efficient ways of gathering statistically valid data and giving your web application a clear and reasonably precise score.

The questions are weighted and then the application is given a grade based on the results. Customers were given access to the system and then asked to fill out the survey results.

Participants will rank each question from 1 to 5 based on how much they agree with the statement they are reading. 5 means they agree completely, 1 means they disagree vehemently.

Here are the questions which were used:

1. I think that I would like to use this system frequently.
2. I found the system unnecessarily complex.
3. I thought the system was easy to use.
4. I think that I would need the support of a technical person to be able to use this system.
5. I found the various functions in this system were well integrated.

6. I thought there was too much inconsistency in this system.
7. I would imagine that most people would learn to use this system very quickly.
8. I found the system very cumbersome to use.
9. I felt very confident using the system.
10. I needed to learn a lot of things before I could get going with this system.

The average System Usability Scale score is 68. We scored a 91.25.

The results of this test can be viewed in the appendix under Testing.

2.4.4 Test Case Testing

We ran test cases to monitor the pass and fail rates of the main functionality in the system.

Test case 1: User Login

Test case 2: User Log out

Test case 3: User Registration

Test case 4: Manager Roster Input

Test case 5: Messaging System

Test case 6: Request System

The results of this test can be viewed in the appendix under Testing.

2.5 Graphical User Interface (GUI) Layout

2.5.1 Web Application Logo

Brands can often be recognized by the logo. E.g. The Golden Arches of McDonalds or the Black Tick that is Nike.

“A logo is to a business as your face is to you.”

Fig 2. Is what the application logo looked like at the mid point stage of the project.



Fig 2.5.1 – Mid-Point Logo

A simple easy to read font, the green and purple figures have the outline of people but also speech bubbles, showing that it plays a key communication factor.

Fig 3 is what the application Logo looks at completely finished, integrating more of a clock like interface.



Fig 2.5.2 – The completed Logo.

2.5.2 Early Stages

In the early stages of development, it was made know that the system in question would not need too many pages for a GUI.

2.5.2.1 Log In Page – Fig 2.5.3

The log in page will be the page the users see first. This page should be simple and easy to read in all stages of development.



Fig 2.5.3 – Early Stages Login Page

2.5.2.2 Register Page – Fig 2.5.4

The register page will be used by new users that would like to join the website.

REGISTRATION

NAME:
USERNAME:
PASSWORD:
PASSWORD:
EMAIL:
EMPLOYER CODE:

REGISTER NOW

Fig 2.5.4 – The Early Stages Registration Page.

2.5.2.3 Roster Page – Fig 2.5.5

There will be a few roster pages and on this page you will be able to see various weeks of rosters for your employment.

	betty	laura	keith	kelly	dylan	antoin	danielle	conor	elaine	marie
mon	9-1	9-9			9-1					
tue			9-1	9-9						
wed		9-1								
thu	9-9									
fri						9-9				
sat										
sun										

Message

Fig 2.5.5– The Early Stages Roster Page

The idea would be that the employment place in question would be the header of the application.

2.5.2.4 Chat Page – Fig 2.5.6.

The chat page is a place in which the employee can chat to other members of staff.



Fig 2.5.6 – The Early Stage Chat Page

2.5.3 Mid-Point Stage

By this stage, some coding was done and the web application was starting to look somewhat proper.

2.5.3.1 Log In Page – Fig 2.5.7

The log in page is where the people would go to log in.



Fig 2.5.7 – Mid Point Login Page

2.5.3.2 Register Page – Fig 2.5.8

The register page is where the new users would go to join the website.



SHIFTS

Registration

Full Name

Email address

Password

Confirm Password

Employee Code

Register

Back

Fig 2.5.8 – The Mid Point Registration Page

2.5.3.3 Roster Page – Fig 2.5.9 and 2.5.10

The roster page is for everyone to go to view the rosters of the weeks in question.



Name	25/01	26/01	27/01	28/01	29/01	30/01	31/01	Hours
Kellie Hughes	9:30 - 21:30	OFF	OFF	9:30 - 17:30	9:30 - 17:30	OFF	10:00 - 18:00	36/16
Aidan Durmin	OFF	9:30 - 21:30	OFF	9:30 - 21:30	9:30 - 17:30	OFF	10:00 - 18:00	40/40
Colin Regan	9:30 - 13:30	OFF	9:30 - 17:30	9:30 - 21:30	OFF	15:30 - 21:30	OFF	30/24
Sean Connolly	HOLS	HOLS	OFF	OFF	OFF	9:30 - 21:30	10:00 - 18:00	34/20
Rosain Bolger	9:30 - 17:30	OFF	9:30 - 21:30	OFF	9:30 - 17:30	OFF	OFF	30/16

Fig 2.5.9 – Mid Point Roster Page

This is what the page will look like if the roster of that week is not available yet.



Fig 2.5.10 – The Mid Point Roster Page

2.5.3.4 Shift Change Request Page – Fig 2.5.11

The Shift change page will be where people can message the manager and ask for the shift to be changed. They would simply message them about the shift they need changing and then based on this the manager can decide if they want to accept the shift change or deny it.



Fig 2.5.11

2.5.3.5 Day Off Request Page – Fig 2.5.12

The day off page will be where people can message the manager and ask for a day off. They would simply message them about the day they need off and then based on this the manager can decide if they want to accept the shift change or deny it.

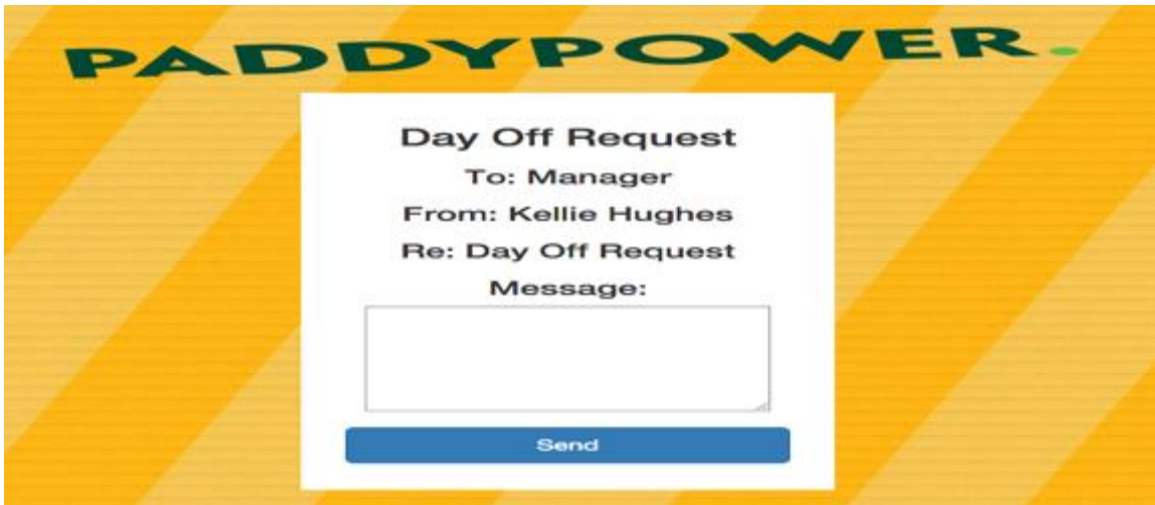


Fig 2.5.12

2.5.3.6 Chat Page – Fig 2.5.13

The chat page is where employees can chat with the employer or the employee. This will come in very useful as it makes it easy to contact people you work with.



Fig 2.5.13

2.5.3.7 Manager Roster Page – Fig 2.5.14

The manager roster page will be the page in which only the manager can have access to and they can submit the rosters for the weeks here.

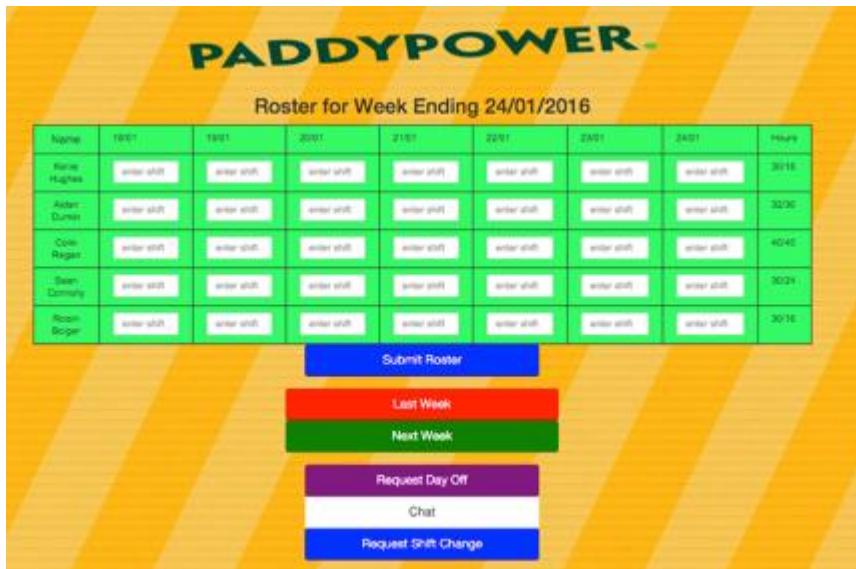


Fig 2.5.14

2.5.3.8 Manager Request Page – Fig 2.5.15

Here is where all the requests will go from the employees. Here the employer can accept or deny the requests made by the employees.



Fig 2.5.15

2.5.4 Final Submission Stage

2.5.4.1 Login Page – Fig 2.6.1



Fig 2.6.1

2.5.4.2 Registration Page – Fig 2.6.2



Fig 2.6.2

2.5.4.3 Roster Page – Fig 2.6.3

Name	01/01	02/01	03/01	04/01	05/01	06/01	07/01	Hours
Kellie Hughes	9:30 - 17:30	OFF	9:30 - 21:30	OFF	9:30 - 17:30	OFF	OFF	30/16
Aidan Durin	HOLS	HOLS	OFF	OFF	OFF	9:30 - 21:30	10:00 - 18:00	34/20
Colin Regan	OFF	9:30 - 21:30	OFF	9:30 - 21:30	9:30 - 17:30	OFF	10:00 - 18:00	40/40
Sean Connolly	9:30 - 13:30	OFF	9:30 - 17:30	9:30 - 21:30	OFF	15:30 - 21:30	OFF	30/24
Roslin Bolger	9:30 - 17:30	OFF	9:30 - 21:30	OFF	9:30 - 17:30	OFF	OFF	30/16

Fig 2.6.3

2.5.4.4 Request Page – Fig 2.6.4

Name:

Type of Request:

Reason for Request:

Fig 2.6.4

2.5.4.5 Managers Page – Fig 2.6.5

Name	18/01	19/01	20/01	21/01	22/01	23/01	24/01	Hours
Kellie Hughes	enter shift	enter shift	enter shift	enter shift	enter shift	enter shift	enter shift	30/18
Aidan Durnin	enter shift	enter shift	enter shift	enter shift	enter shift	enter shift	enter shift	32/30
Colin Regan	enter shift	enter shift	enter shift	enter shift	enter shift	enter shift	enter shift	40/40
Sean Connolly	enter shift	enter shift	enter shift	enter shift	enter shift	enter shift	enter shift	30/24
Roisin Bolger	enter shift	enter shift	enter shift	enter shift	enter shift	enter shift	enter shift	30/18

Submit Roster

Fig 2.6.5

2.5.4.6 Chat Page – Fig 2.6.6

Message Members of Staff

Name:

- Kellie Hughes- Isn't Shifts really great?
- Colin Regan - Yes I really enjoy how easy to use it is!
- Sean Connolly- Hi can anyone cover my shift on Wednesday?
- Roisin Bolger- Hey Sean I can cover your shift!
- Sean Connolly- thanks Roisin I'll put in a shift change request!

Message:

Fig 2.6.6

2.6 User Manual

Shifts – The Rostering System

Employer User Manual

Welcome to Shifts the rostering system that is going to improve how you interact with your employees!

Website Link:

To get to the shifts web application the link is:

<https://shiftscloud.herokuapp.com/>

Login Details:

As you are the employer these login details are just for you.

Email: admin@shiftsapp.com

Password: password

Registering an Employee:

To register a new user, go onto the “New User” tab and enter the details of the user you would like to add. Then give this information to the employee. This will then give them access to the employee section of the application.

Entering a new roster:

To enter a new roster into the system please enter the time shifts you would like to enter and then press the enter key on your keyboard. This will save this information to the system.

Viewing requests:

Employees can put in requests for shift changes and for days off. To view these requests click on the “Employee Requests” tab and all of the requests should be viewable from there.

Any queries please don't hesitate to contact us at support@shifts.com . We hope you enjoy your new rostering system

2.7 Evaluation

Commercialization

A great way to evaluate something is to figure out if there is market for it out there and would the product sell.

Question: Would Shifts sell?

Answer: Yes

Questions	YES	NO
Does your job involve a roster or include shift work?	85%	15%
Would a website in which you could easily see your upcoming rosters appeal to you?	84%	16%
<i>Would a website in which you could easily request days off or shift changes appeal to you?</i>	92%	8%
<i>Would a website in which you could easily chat to other Co-workers appeal to you?</i>	86%	14%

Questions	Extremely Likely	Quite Likely	Moderately Likely	Slightly Likely	Not likely at all
<i>How likely would you be to use this website?</i>	52%	32%	10%	0%	6%

Judging by the market research at the start of the project and the customer testing evaluations at the end, it is clear to see that Shifts is a product that is easily sellable on the market and easily wanted. The studies showed that there was nothing on the market like it so to take something and to turn it into a product that nobody has

seen before deserves merit by itself but also combine that with the point that the customers who tested the product enjoyed the product.

Testing

Unit, Load and Stress Testing were all tests that were run to ensure the application was capable of being viable and the results were very pleasing (see testing section for results) proving again that Shifts is an excellent project.

Functional and Non Functional Requirements

The functional and non-functional requirements of the application that were set at the beginning of the project have all been executed. This is a sign of the progress achieved and shown in the evaluation of the success of the project.

The overall evaluation of the project is that it was developed to provide a solution for both employees who work in a hourly rated business to be able to see their shifts and their employer to manage the shifts. Also, the project was built to demonstrate the area of specialization. We successfully managed to achieve the aforementioned two points, we implemented a project which is both commercially viable and also heavily cloud based (we use Firebase, a backend as a service, and its cloud based NoSQL database, and also the application is hosted on the cloud). Therefore this project is a success.

3 Conclusions

Advantages

- Can be easily commercialised
 - With this project being a business-like application it would be very easy to make it available to businesses and to make money off the idea.
- Good for large companies and small companies
 - With its scalability, the application can suit everyone's needs.
- Increases communication within a business
 - With an easy to use interface, it will make it easier to ask for time off or ask for a shift change.
- Happy staff equals happy customers.
 - With the employees being able to see their rosters in advance, they will be more pleased within their work. This will be shown in the workload that they take on and how they manage it.

Disadvantages

- Small Project
 - With being a small project it could be very hard to become a household name and having very limited skills and knowledge being a single developer rather than on teams.
- In-house systems
 - Companies having in-house systems could take away our chances of their business.

Opportunities

- Opportunities to expand
 - The opportunity to expand the project to bigger more well known businesses like Tesco's or Dunnes Stores
- Opportunities to make an Android or Apple application
 - Opportunity to make the application on your hand held device which would lift Shifts even further into advancements.
- Opportunities to bring the company worldwide
 - Opportunity to make the project available worldwide. Making the languages available to all and making the payment system easy for online access

Limits

- Limited Features
 - With trying to make the application as easy and user friendly you could be limiting yourself to what you can develop.
- Limited access to funds.
 - Limited access to funds, it could flatline quickly.

4 Further development or research

With more resources, Shifts could be taken global. With there currently being no other system like this out on the market that is not in-house systems, it could be very easy for a business person to see potential. The business and all of its functions could be backed by huge corporations. This could lead to it maybe being developed into a mobile application which would make it even more user friendly.

As referenced before, Shifts, from my research, seems to be a really in demand project by workers in the shift industry, making Shifts hugely commercialable.

Employers would also be highly interested as it could be branding it as an application that promotes productivity as it makes it very accessible to work on your days off and maybe even work from your phone meaning that their shifts could be filled with more productive things.

Overall, Shifts is a great idea because it has yet to be created and since the survey seems to have a huge buzz about it. It's commercialable as it appeals to both employee and employer.

4.1.1 Automatic scheduling of shifts

As an extension to the initial project proposal, we looked into scheduling the shifts automatically based on different constraints (e.g. employee availability, shift duration).

Unfortunately, we did not have time to implement the algorithm, as we would have liked to. However, if we would have had the time, the algorithm we would have implemented is the Nurse Rostering Algorithm and we would have paid particular attention to the shift changing section of the algorithm. The Nursing algorithm looks into all of the factors needed in creating a successful roster.

Hard Constraints

- Every shift needs to be filled with at least one employee.
- A single employee can only have one shift on one day.

Soft Constraints

- Each employee needs to work their rostered hours
- Each employee can't work too many consecutive days in a row.
- A late shift followed by an early shift the next morning is frowned upon

Employees Wishes

- Day off request – employees can request certain days off
- Shift off request – employees can request certain shifts off.

5 References

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2.3.4 Algorithms

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2.5 Graphical User Interface (GUI) Layout

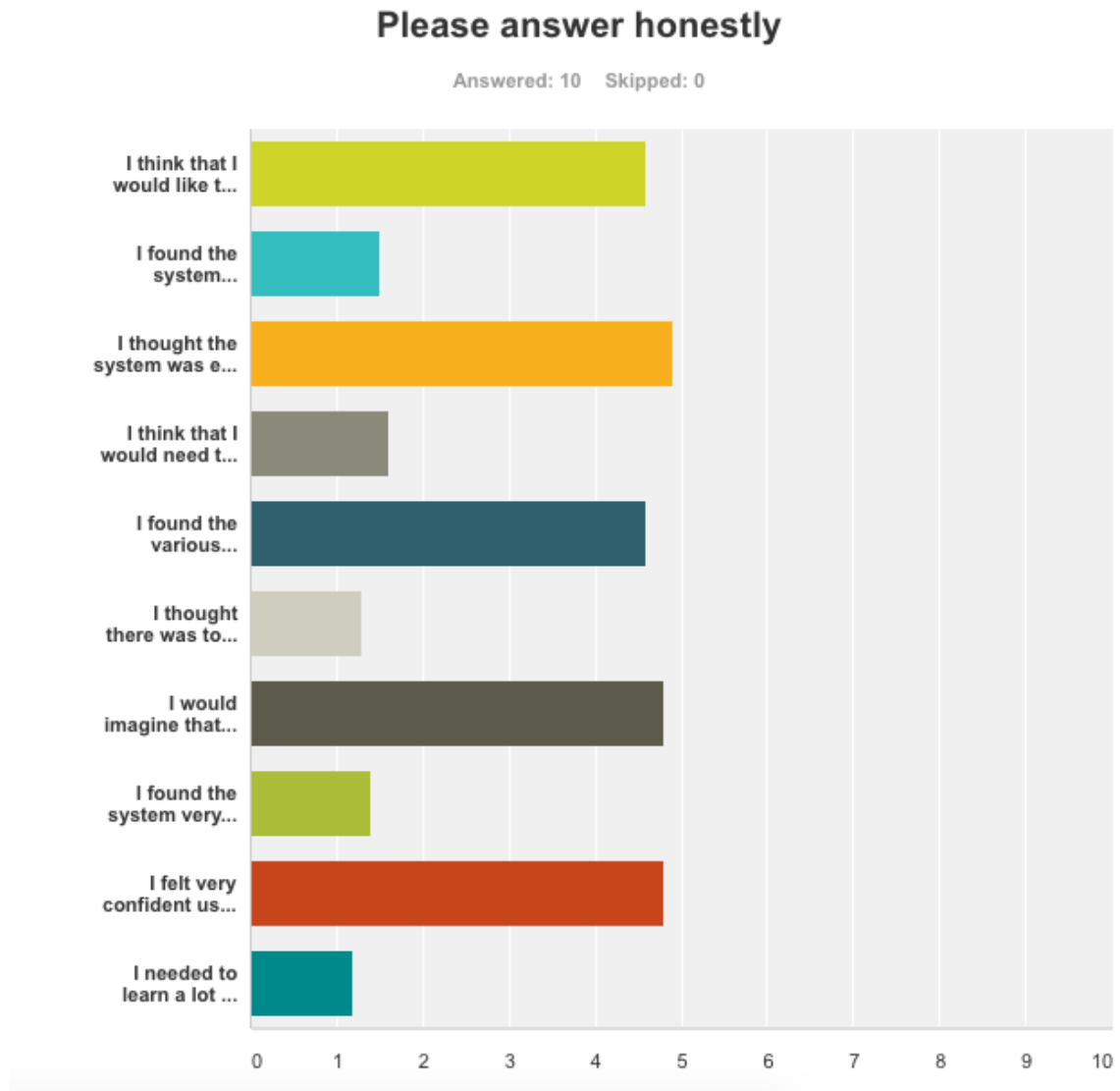
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6 Appendix

6.1 Test Results

6.1.1 Customer Testing



	Strongly Disagree	Somewhat Disagree	No Opinion	Somewhat Agree	Strongly Agree	Total	Weighted Average
I think that I would like to use this system frequently.	0.00% 0	0.00% 0	10.00% 1	20.00% 2	70.00% 7	10	4.60
I found the system unnecessarily complex.	60.00% 6	30.00% 3	10.00% 1	0.00% 0	0.00% 0	10	1.50
I thought the system was easy to use.	0.00% 0	0.00% 0	0.00% 0	10.00% 1	90.00% 9	10	4.90
I think that I would need the support of a technical person to be able to use this system.	60.00% 6	30.00% 3	0.00% 0	10.00% 1	0.00% 0	10	1.60
I found the various functions in this system were well integrated.	0.00% 0	0.00% 0	0.00% 0	40.00% 4	60.00% 6	10	4.60
I thought there was too much inconsistency in this system.	80.00% 8	10.00% 1	10.00% 1	0.00% 0	0.00% 0	10	1.30
I would imagine that most people would learn to use this system very quickly.	0.00% 0	0.00% 0	0.00% 0	20.00% 2	80.00% 8	10	4.80
I found the system very cumbersome to use.	70.00% 7	20.00% 2	10.00% 1	0.00% 0	0.00% 0	10	1.40
I felt very confident using the system.	0.00% 0	0.00% 0	0.00% 0	20.00% 2	80.00% 8	10	4.80
I needed to learn a lot of things before I could get going with this system.	90.00% 9	0.00% 0	10.00% 1	0.00% 0	0.00% 0	10	1.20

A	B	C
Question	Mean User's Rating	SUS score
1. I think that I would like to use this system frequently	4.6	3.6
2. I found the system unnecessarily complex	1.5	3.5
3. I thought the system was easy to use	4.9	3.9
4. I think that I would need the support of a technical person to be able to use this system	1.6	3.4
5. I found the various functions in this system were well integrated	4.6	3.6
6. I thought there was too much inconsistency in this system	1.3	3.7
7. I would imagine that most people would learn to use this system very quickly	4.8	3.6
8. I found the system very cumbersome to use	1.4	3.6
9. I felt very confident using the system	4.8	3.8
10. I needed to learn a lot of things before I could get going with this system	1.2	3.8
SUS score		91.25

6.1.2 Test Case Testing

Test case 1: User Login

Project Name: Shifts – The Rostering System	
Test Cases	
Test Case ID: 1	Test Designed by: Kellie Hughes
Test Priority (Low/Medium/High): High	Test Designed date: 8/05/2016
Module Name: User Login	Test Executed by: Kellie Hughes
Test Title: Verify login with valid username and password	Test Execution date: 08/05/2016
Description: Testing that users can access pages	
Pre-conditions: User has valid username and password, site is live.	
Dependencies:	

Step	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
1	Navigate to login page	Shiftscloud.herokuapp.com	User should be able to login		Pass	
2	Provide valid username	Email: admin@shiftsapp.com				
3	Provide valid password	Password: password				
4	Click on Login button		Should be taken to roster page	User is taken to roster page	Pass	

Post-conditions: User is validated with user authentication and successfully login to system.

Test case 2: User Log out

Project Name: Shifts – The Rostering System	
Test Cases	
Test Case ID: 2	Test Designed by: Kellie Hughes
Test Priority (Low/Medium/High): High	Test Designed date: 8/05/2016
Module Name: User Log out	Test Executed by: Kellie Hughes
Test Title: Verifying user log out	Test Execution date: 08/05/2016
Description: Testing that users can log out of the system	
Pre-conditions: site is live, users are logged in	
Dependencies:	

Step	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
1	Click on Logout Button		User should be able to log out		Pass	

Post-conditions: User is successfully logged out of the system
--

Test case 3: User Registration

Project Name: Shifts – The Rostering System	
Test Cases	
Test Case ID: 3	Test Designed by: Kellie Hughes
Test Priority (Low/Medium/High): High	Test Designed date: 8/05/2016
Module Name: User Registration	Test Executed by: Kellie Hughes
Test Title: Admin can register new users	Test Execution date: 08/05/2016
Description: Verifying that users can be added.	
Pre-conditions: Manager has valid username and password, site is live.	
Dependencies:	

Step	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
1	Navigate to manager login.	Shiftcloud.herokuapp.com	User should be able to login		Pass	
2	Provide valid username	Email: admin@shiftsupp.com				
3	Provide valid password	Password: password				
4	Click on Login button		Should be taken to roster page	User is taken to roster page	Pass	
5	Navigate to new user login		Should be taken to new user page	User is taken to new user page	Pass	
6	Add new user details		New user should be added	New user is added	Pass	

Post-conditions: New users should be successful registered.

Test case 4: Manager Roster Input

Project Name: Shifts – The Rostering System Test Cases	
Test Case ID: 4	Test Designed by: Kellie Hughes
Test Priority (Low/Medium/High): High	Test Designed date: 8/05/2016
Module Name: Manager Roster input	Test Executed by: Kellie Hughes
Test Title: Manager can input new rosters	Test Execution date: 08/05/2016
Description: Verifying that rosters can be added by management	
Pre-conditions: Manager has valid username and password, site is live.	
Dependencies:	

Step	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
1	Navigate to manager login	Shiftscloud.herokuapp.com	User should be able to login		Pass	
2	Provide valid username	Email: admin@shiftsapp.com				
3	Provide valid password	Password: password				
4	Click on Login button		Should be taken to roster page	User is taken to roster page	Pass	
5	Add new roster details		Should be able to add new rosters	New rosters are saved to the database.	Pass	

Post-conditions: New rosters are implemented to the scheduling.

Test case 5: Messaging System

Project Name: Shifts – The Rostering System		Test Cases				
Test Case ID: 5	Test Designed by: Kellie Hughes					
Test Priority (Low/Medium/High): High	Test Designed date: 8/05/2016					
Module Name: Messaging System	Test Executed by: Kellie Hughes					
Test Title: Can members chat to each other	Test Execution date: 08/05/2016					
Description: Verifying that users can send and receive messages						
Pre-conditions: users are logged in, site is live.						
Dependencies:						
Step	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
1	Navigate to login page	Shiftscloud.herokuapp.com	User should be able to login	User is logged in	Pass	
2	Provide valid username	Email: admin@shiftsapp.com				
3	Provide valid password	Password: password				
4	Click on Login button		Should be taken to roster page	User is taken to roster page	Pass	
5	Navigate to chat page		Should be taken to chat page	User is taken to chat page	Pass	
6	Provide a username				Pass	
7	Provide a message					
8	Press enter key		Message should sent	Message has sent	Pass	
Post-conditions: A message from a user has sent.						

Test case 6: Request System

Project Name: Shifts – The Rostering System		Test Cases				
Test Case ID: 6	Test Designed by: Kellie Hughes	Test Designed date: 8/05/2016	Test Executed by: Kellie Hughes			
Test Priority (Low/Medium/High): High	Test Executed date: 08/05/2016					
Module Name: Request System						
Test Title: Can members submit a request						
Description: Verifying that users can submit requests						
Pre-conditions: users are logged in, site is live.						
Dependencies:						
Step	Test Steps	Test Data	Expected Result	Actual Result	Status (Pass/Fail)	Notes
1	Navigate to login page	Shiftscloud.herokuapp.com	User should be able to login	User is logged in	Pass	
2	Provide valid username	Email: admin@shiftsapp.com				
3	Provide valid password	Password: password	Should be taken to roster page	User is taken to roster page	Pass	
4	Click on Login button		Should be taken to request page	User is taken to request page	Pass	
5	Navigate to request page				Pass	
6	Provide a username				Pass	
7	Provide a request				Pass	
8	Press enter key		Request should sent	Request has sent	Pass	
Post-conditions: A request has been submitted by the user						

6.2 Project Proposal

6.2.1 Objectives

The objective of this class is to create a project of a reasonable size in our area of specification. This project will be designed by us and we will be keeping journals and reports to track the progress of this project. This project is the final hurdle we have to face with it being the largest proportion of our final year.

My personal objective is to create a web based roster application, which is hosted on the cloud. If this project is successful the employees of major businesses will have an easy to use web application in which they can view and possibly swap their rosters with other staff members. This will be an app that some clients might find interesting as it gives the employees a place to talk about work under the eyes of management.

Not only will this project be teaching us skills in the line of computing but also teaching us communication between clients and showing us how to excel our confidence by making us do presentations on our final projects, which teaches public speaking. The goal of this project is to show us what a real job like start to finish project is like along with the reports and the twist and the turns along the way.

I have decided to call my project Shifts as it is an easy word, which can be used as a time of work, and it is also use to shift (aka move) your work schedule with somebody else's.

6.2.2 Background

The chosen decision was to do a web based application which makes viewing your shift work in your job, asking to change your shift work and talking to other members of staff because researched showed that it should be a product that exists and if this product did exist it would be heavily used.

The name “Shifts” was used because another name for a time of work is a shift and it could have a slogan of “shift your shifts” if it was to go more public. Having a product that branding it correctly is key.

Working in Paddy Power bookmakers taking bets and paying people out on winning bets for almost three years now has proven that the need for this project exists.

The problem that people have with working these shifts is that they can be very forgetful person and the consumer can forget when they have to work which leads to them having to ring their office a lot and ask. Another problem is that the rosters or shift work sometimes don't be viewable in the shop whereas if they had this application it could be easier to see your roster weeks in advance.

With this product available it would mean that the employees would not have to ring my job and disrupt work.

Researching on the Internet for something along the lines of this application however the only one found was an in-house application that was for Air Hostesses with Aerlingus. If Aerlingus is using it and it being such a successful company, this application obviously benefits both the employee and the employer otherwise it wouldn't be a protocol they were still using.

The idea was pitched to some employees of companies that use shift work and they think that this would be a great idea to roll out into companies especially the big ones.

The idea was also pitched to the manager in Paddy Power Bookmakers and she also agreed that it was great idea and thought that it was a benefit to both employees and employers as it makes the employees happy and if the employees are happy in what they are doing and how they are being treated then they will respect the company and work harder for the company.

With taking this application to big companies like Paddy Power and Tesco, where they have huge databases of employees would benefit the company's productivity

hugely. Sometimes the bigger the company the less time the employee has to talk to their boss so this application would be handy to make sure that the employee didn't just get lost in a sea of other employees.

6.2.3 Technical Approach

The approach to take will be to make a very easy to use and easy to read interface. The goal for this task will be to make sure that it is cloud based as cloud computing is the future. The plan is to host it on Heroku.

This application will 2 log ins, it will have the log in from the employers point and also from the employees point. Every user will have their own logins and certain people get certain control limits (employer vs employee)

Once they have that pin their employees will be able to log into the shop that has their information in it. Once that is done the next step will be to integrate a chat function which means that you can talk to the people you work with. This will be a nice feature if you need to ask for holidays or ask another co worker to swap a shift with you.

The research has been conducted by checking what products are available online and asking the employees of big companies and also the employers of big companies what they think of the product and how they think it would affect the job.

Laura employer: "I think that this would be a great idea for larger shops and businesses to integrate because it would make the life's of the employees easier and then by association make the employers job easier. The main thing is trying to make it appealing to both because otherwise it won't work."

Róisín employee: "I love this idea, we are always struggling with remembering when we are working and having it easy to access on the internet would just make my life so much easier plus being able to contact work people isn't always the easiest so to make that possible would be great."

6.2.4 Technical Details

The application is going to be web based on Heroku so HTML and CSS is going to be used to get the base of the web application. Then after that using Javascript or maybe integrating an API to show all of the roster work.

The project will be based in the cloud and the database will be integrated using MySQL. The database is going to be used to hold all the information about the employers and employees.

A login site will need to be made for both parties with different parts of information needed.

6.2.5 Evaluation

In order to test the application and make sure that it is reaching its full potential you would have to test a number of things.

6.2.5.1 Tracking results:

Start by making sure the project is doing what it is trying to achieve and to make sure that it is both appealing to employee and employers while also keeping track of my progress and making sure there is documentation.

Making sure that the Project plan was followed and that nothing was missed.

6.2.5.2 Test Environment:

In usability testing, you'll be looking at aspects of your web application that affect the user's experience, such as:

- How easy is it to navigate through your web application?
- Is it obvious to the user which actions are available to him or her?
- Is the look-and-feel of your web application consistent from page to page, including font sizes and colors?

6.2.5.3 Unit Testing:

Unit testing is focused on verifying small portions of functionality. For example, checking on the application that correct data has been saved to the database when the Submit button on a particular page is clicked.

6.2.5.4 Verifying the HTML:

Simple but crucial the project would need to make sure that the HTML was in perfect working order and that the redirects were going to the right place.

6.2.5.5 Load Testing:

In performing load testing, you want to simulate how users will use your web application in the real world. The earlier you perform load testing the better. Simple design changes can often make a significant impact on the performance and scalability of your web application.

6.2.5.6 User Acceptance Testing:

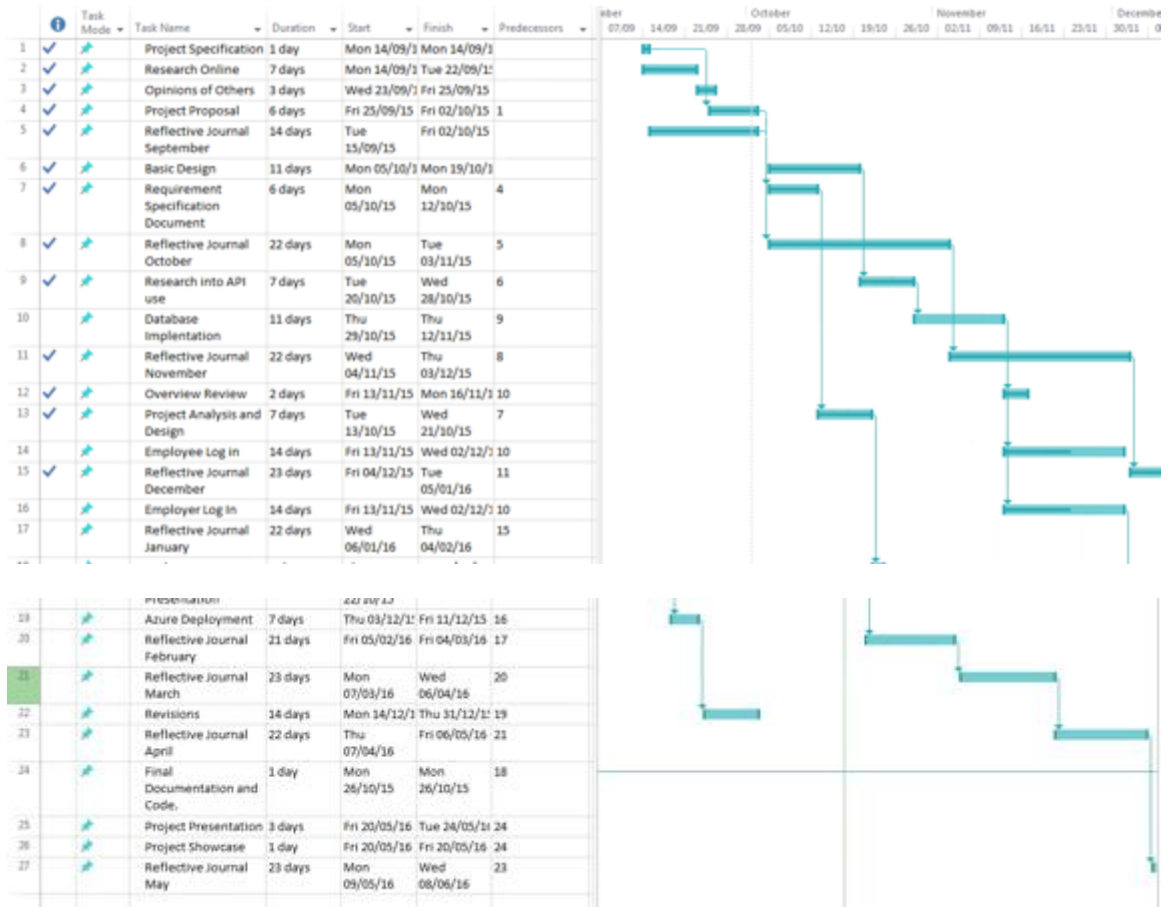
By performing user acceptance testing, you are making sure your web application fits the use for which it was intended.

6.2.5.7 Security Testing:

Security testing is vital as there would be information about people that some people would not like if it was breached. The most important of all the tests in the security test as security is the most important in anything.

6.3 Project Plan

Attached is the project plan with this document. Here are some screenshots of the project plan



6.3.1 System Evolution

The system is a very easy to use system and if it was to take off and be a success it could go onto timekeeping and monitoring when an employee logs into work. It could be developed to not only be a time management piece of equipment but also a time keeping piece of equipment. I think this would be good as it could be combining two applications in one. This is highly beneficial

to companies and over time it would be a huge success and could go on to be used by huge major companies.

6.4 Monthly Journals

6.4.1 Reflective Journal - September

Student name: Kellie Hughes – X12388761

Programme: BSc (Hons) in Computing with a specialization in Cloud Computing

Month: September 2015

Summary

This month was the start of the project where we had to think of the idea, do some research and then write up the project proposal document.

In September my main objective was to come up with an idea that I was passionate enough to base my Software Project on. I had always had this idea in the back of my head but didn't know if it would be good enough.

This month I done the research to see if there was a website like this and apart from an in-house Aerlingus one for the flight attendants there was no other website like it. I was really surprised as I like the idea and thought it might have already been made.

Because the application is aimed towards a work background I needed to get the opinion of the people who it could possibly benefit. "Shifts" is a web-based application that you can view your roster online for your job via the log in and also chat to other people that you work with including your manager.

I decided to ask my manager Laura what she thought about the project idea. She was my "employer" research:

"I think that this would be a great idea for larger shops and businesses to integrate because it would make the lives of the employees easier and then by association make the employers job easier. The main thing is trying to make it appealing to both because otherwise it won't work."
I also decided to ask my friend Róisín who works in Nandos what she thought about the project idea. She was my "employee" research:

"I love this idea, we are always struggling with remembering when we are working and having it easy to access on the Internet would just make my life so much easier plus being able to

contact work people isn't always the easiest so to make that possible would be great."

Intended Changes

Next month I need to get the basic design down and really put down on paper what exactly I need to do and how to get it done. I think time in this project might be a bit of challenge for me because I have always struggled with time management and having a job is adding time pressure. I just need to get into my stride and put my head down to get something done. I did not realise that this year was going to be so demanding in all of the subjects.

Supervisor Meetings

We have yet to be assigned our supervisors. I am excited about the supervisor because it will be nice to have someone to talk to about my project and any problems I face but also nervous because I think having a supervisor will put on added pressure to do good in the project and use my time wisely

6.4.2 Reflective Journal - October

Student name: Kellie Hughes – X12388761

Programme: BSc (Hons) in Computing with a specialization in Cloud Computing

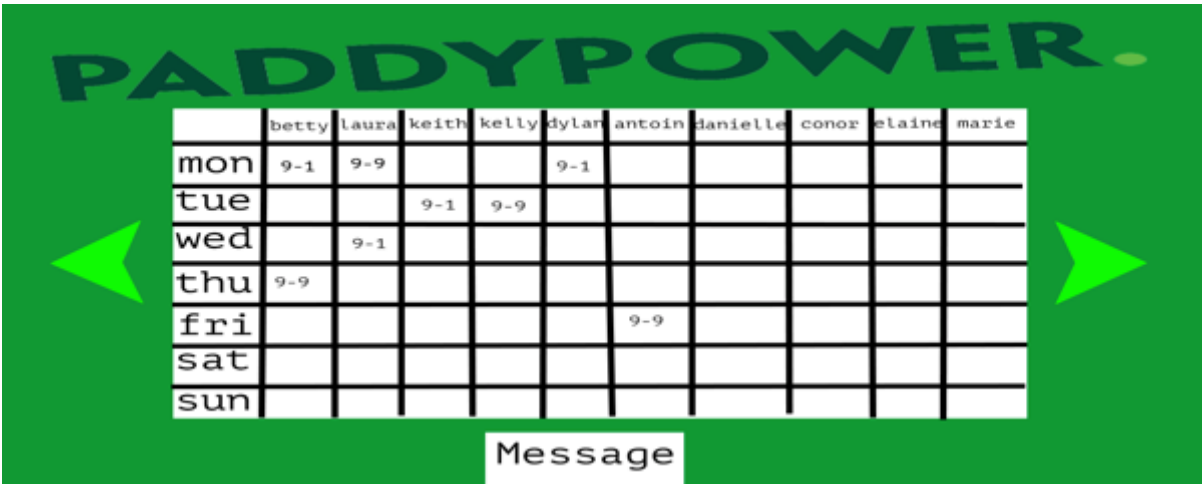
Month: October 2015

Summary

In October my plan was to really make it clear to myself what I wanted to make this project look like a design a basic html to store a wireframe so that I know what the project would look like. The wireframes that I created to be stored in the HTML were very basic and rough but they gave me an idea of what I wanted them to look like and what kind of functionality I would need.



The log in page – this would be the first thing that anyone sees when they go onto the website and users would log in and be taken to the roster of their choice.



The Roster System: in this page you will be able to see the shift work for everyone in your job and see when you are working. From here you will be able to go to the chat system.



The chat system: this will be a simple chat system in which you can talk to the people in your job and ask them to swap shifts with you. I think this is a good idea because you don't always get a place to talk to your work friends and with this system all of the messages will be sent to the manager too so that they can give clearance on the shifts that have been swapped.

This month I've also been researching the cloud deployment of the project as cloud computing is my specialization. I have been looking into Amazon Web Services and also Pagoda Box. I have been looking into not just hosting it on a cloud server but also looking into seeing what other cloud things or applications I could use to make the project more cloud based. I am finding this difficult as the cloud is still relatively new and there are not a lot of things online about cloud applications.

Intended Changes

My intended changes from last month really went to plan and I am happy with what I achieved but I need to keep up a steady flow of work while also not forgetting about other subjects. I think I won't get as much project work I would like to get done this month as there are a few assessments and exams due for other subjects. The Requirement Specification document is due for this class so that will also be taking some of my time.

But this month I intend to really look into and lock down the cloud aspect of this project and I would also like to look into more languages that I could possibly use.

Supervisor Meetings

I had my first meeting with my Supervisor and she seems lovely her name is Adrianna Cris and she is the academic supervisor for 3 or 4 of the Cloud people in my class. She plans for us to have group meetings every two weeks on a Friday so that we can discuss what we are doing and how we can improve on the idea.

On Friday I was the only person to turn up for the meeting and she gave me some great pointers about my project and how to improve on what I am doing. She says that I should be looking at cloud applications like cloud based databases and stuff and not just the cloud deployment. I have taken this on board and I am researching into it.

She also says that I should make my project a little more complex and use more languages. This makes me a little nervous because I am not very good at code but I will try my best to take all the things that she has said on board and try to improve.

6.4.3 Reflective Journal - November

Student name: Kellie Hughes – X12388761

Programme: BSc (Hons) in Computing with a specialization in Cloud Computing

Month: November 2015

Summary

In November my plan was to research into the coding of the website and to find out what language I wanted to code in. I think I have decided that I will do Java as I have some experience in it and there seems to be a lot of how tos in regards to the stuff I need to be able to do (e.g. create a log in system) as for the actual coding of the website in the look of it this will be designed with Bootstrap CSS and PHP. PHP is not something that I am not overly familiar with but then again I think that there is lots of examples online for how to do it and also PHP is highly used in the working world of website making so it would be a key skill to try and learn to do.

This month has been really hectic in regards to college work as there were a lot of exams and quizzes for other classes but also projects due. These projects I think are helping me along in the thought process involved with the project. Our Cloud Computing project was to deploy applications that we had made onto the cloud. We had to do research into this

and learn how to do it. This made me learn Git, which can come in very helpful for my project, but also it showed me that most applications rely on PHP to push the information/applications. This was valuable information for me as had I not known this I would have coded my project in HTML and then would have had to change it when I came into trouble.

This month also involved looking into chat systems and login functionality, which could come in handy for my project, as I need a chat system and a log in.

The final thing about the project this month is that we must to our version 1 of the Analysis and Design document. This was a hefty document.

Intended Changes

My intended changes for the next month is to be able to see the difference that I have made in the project as up to now it has mainly been researching and documentation with the odd wireframe.

This month I would like to look at getting the log in working with a working database. I will also need to set up a registration to be able to take new users, which I will have to look into. I hope to get a fair bit done next month as we have slightly more time to work on the project what with the projects and continuous assessments for the other classes out of the way.

Supervisor Meetings

This month I had another 2 meetings with my supervisor and have been keeping in touch with her via email. We have to organise a meeting for next week to discuss my Requirement Specification document and she can give me some pointers on how to make it better and how to improve.

The meetings that we have are supposed to be group meetings as she have 3 or 4 people to supervise but I seem to be the only person who ever shows up to the meetings.

So far I have taken on board everything that she has said and tried to work on it. I am very keen to hear what she thinks about my requirement specification document and see what she would like me to change about it

6.4.4 Reflective Journal - December

Student name: Kellie Hughes – X12388761

Programme: BSc (Hons) in Computing with a specialization in Cloud Computing

Month: December 2015

Summary

In December my plan was to design the applications better with PHP and Bootstrap and to have a look at getting the Log in system to work. The log in system for me seems to be problem because the tutorials that I am finding don't seem to be ones that are working or have been completed.

This month for me in regards to the project was a month of little battles that seemed to be time consuming. While changing the code that I originally had in HTML I then had to change it to PHP and find out how to get it running on my local host on my MacBook pro. I then spent a lot of this month trying to get the log in system to work which required me to look out for a lot of tutorials most of which did not seem to work.

However I do think that I have a clearer vision on the application. I was trying to figure out a way to make an editable roster system but I have decided to work with an editable table/excel sheet like system in which the manager just has to input the data of that day in order to give people their details.

The Mid Point Presentation is coming up soon and I am nervous but also excited. I am nervous about it as I still need to do a loot of work on my actual project but in regards to the presentation I think that ill enjoy it because I like to present to people my ideas and from there I think that I will be able to show them the vision that I have from this application.

Intended Changes

My intended changes for the next month is to have a prototype in which I will be happy to show people the application. Ideally I would like it working but I would be happy with a prototype, which just shows the application and shows the navigation around the various pages. I would like to show that clicking on certain buttons sends you to a certain page. I would love to have the log in system working but it is proving a challenge for me.

I also need to prepare for my exams from my other Semester 1 classes but also prepare a well thought out and well laid out presentation for the mid point presentation.

Supervisor Meetings

Because this month was a time in which we had a lot of time at home and not a lot of college I have not seen my supervisor although I do know that if I come into any difficulties she is there to help me.

6.4.5 Reflective Journal – January

Student name: Kellie Hughes – X12388761

Programme: BSc (Hons) in Computing with a specialization in Cloud Computing

Month: January 2016

Summary

In January there was a divide on where I was spending my time. Whilst trying to spend a lot of time on my project I was also careful to spend enough time focusing on my exams that we had between the 8th-16th January. The exams were okay enough with a few curveball questions but I think I will be okay for the results at the start of February.

Overall with my project this month I am happy with how it is turning out and I feel like I am really prepared for the Mid Point Presentation. At the start I was really worried about my prototype but in the first week back Eamon assured us that it just has to show it how it is working. This has settled me a bit as I was getting very stressed. However Eamon asked the class how they were doing in their projects and they seem to be a bit behind me so I think my progress is appropriate.

This month I focused on the document that is due for the Mid Point Presentation. I have worked really hard on making it look as legitimate as possible. The document at the moment is sitting close on 10,000 words.

I have worked this month on my prototype so that it works and that you can navigate throughout the pages. Unfortunately I have not gotten the log in to work but I can focus on that after the presentation.

This month I created a survey at the start of January to ask people their opinions of the application and overall the feedback was positive. People seemed to like the idea and said that they would use the product if it came available.

Intended Changes

My intended changes for the next few weeks are to focus on the document and to get it finished and looking as good as possible. I also want to make sure that the prototype is working and if I have time I would like to deploy the first stage of the website onto the cloud.

I need to focus on my slides and how I am going to present myself in the presentation. After the presentation I will need to get back into working on the functionality of the application.

Supervisor Meetings

As it is the first month back both my supervisor and myself have been busy with college so we have yet to meet up however I have no problems that need immediate attention so it is okay. I will see my supervisor at the Mid Point presentation.

6.4.6 Reflective Journal – February

Student name: Kellie Hughes – X12388761

Programme: BSc (Hons) in Computing with a specialization in Cloud Computing

Month: February 2016

Summary

In February we had the Mid-Point presentation which I worked really hard for and I believe the result that I got given has shown this. The second examiner seemed happy with the project that I was showing and commented that she really liked the idea. For the first half of February I focused on the run up to the Mid-Point presentation. By the Mid-Point I was happy with my document and my prototype and deployed the prototype to a cloud platform.

The second half of February I focused on the points that had been given to me in the presentation and tried to fix them. I made the document read more professionally and I added the small things like page numbers etc. The second examiner commented on the logo design of the application and that I should incorporate a clock like interface to make it look more like the project that I was selling. The second examiner commented on the colour scheme of the project so I made the colours more professional looking.

Before Mid-Point Presentation



After Mid-Point Presentation



This month I also worked on getting a chat system in place and having the information save to a cloud based database system called Firebase. I would obviously like to improve the functionality of the chat system but I am happy with the progress I have made so far.

Intended Changes

My intended changes for the next month is to work on the applications information being stored in the cloud based application called Firebase. I need for the login system to be working in there but I also need the rosters to save to the database so I will be working on these changes.

Supervisor Meetings

Over February, Adriana has been so helpful and supportive with my project and was so helpful when it came to advice on the Mid-Point Presentation. The last time that we met she has asked me to make a list of all the things that I need to do and to give them a time limit. We still have meetings every two weeks and have been keeping in touch by email.

6.4.7 Reflective Journal – March

Student name: Kellie Hughes – X12388761

Programme: BSc (Hons) in Computing with a specialization in Cloud Computing

Month: March 2016

Summary

What a successful month! March was a very productive month. In March I managed to get my chat system working so that members could talk to each other, I got my requests page working so that users could request days off or shift changes and their requests would be saved to the database and displayed back out to the employer.

This month I have also got the log in pages and the registration pages working. To access the system the user must be a registered user. A user can be made a registered user by the manager registering them in the admin part of the system. This was the biggest struggle for me and I am extremely happy with how it turned out.

This month I have also had to focus on the final document, cleaning up my code, the profiles for the showcase booklet and also working on my poster for the actual showcase.

Finally I have ran a test deployment onto Heroku to make sure that all of the code was working as it should.

I have also figured out how to save the rosters to the database, this just needs to be implemented into the code.

Showcase Poster:

National College of Ireland

BSc (Hons) in Computing
- Cloud Computing

SHIFTS

Kellie Hughes

With nothing on the market like it, Shifts is a web based application that closes the divide of communication between employer and employee in roster based companies whether big or small.

EMPLOYEES CAN:

- View current and previous rosters of their place of employment
- Request shift changes
- Request days off
- Chat to other members of staff.

EMPLOYERS CAN:

- Use all of the functionality available to an employee
- Add new rosters to the website
- Manage requests from employees
- Add new staff members to the system

Technologies Used:

Screenshots:

Intended Changes

This month is the final month! I will work on final changes of the project and I also have to do my testing. This last month will be the final push but I am feeling hopeful.

Supervisor Meetings

Adriana has been super supportive for this whole project and has helped me out when I have started to panic, Adriana is keeping me on track and our meetings are showing me the right way in which to go. I look forward to our meetings to show the progress I have made.