

School of Computing and Mathematics

PRCO303SL

Final Stage Computing Project

BSc (Hons) Software Engineering

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Human Resource Information System

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# 1. Introduction

The Project is to develop a HRIS system or also known as the Human resource information system, the system will be available as web app and as a mobile app for mobile phones, this is to improve the user experience and making it convenient for users to access the application whether they are in the office or not. This application will be mainly used by Human resource managers to manage the employees in the business in an effective and efficient manner. The HRIS systems main goal is to make the tasks of human resource manager easier and faster so that they can spend more time making strategic decisions to improve the business. Another main objective of this system is to improve the communication within the business so to do so this system has an employee’s interface of software added which allows employees to submit request forms, chat with others and much more. To develop this project the incremental approach is used because of its ability to allow me to make changes to the development within the increment and because of its other advantage which is the errors are easy to find when compared with the other types of approaches.

# 2. Business Case

## 2.1 Business needs

There are several factors that affect the business it may be in a positive way or else a negative way but what decides this outcome depends on how the business manages these factors. The employees of the business are one of the main factors that can have a huge impact on the organization, so the business needs to manage it in a proper manner. According to (Balyuk, 2020) Management of employees is important because the company is made up of people with different ages, customs and profiles and managing them is crucial to the success of the business and she also states that if they are managed in a proper manner it could provide benefits like good working environment, employee development, Increased productivity, motivation and finally business objective alignment. So, what the business needs is a user friendly HRIS system that has the functionalities required for management of employees and reduce the mundane tasks of human resource managers. A good HRIS does not just help the business and HR managers it also helps the employees working in the organization making them more motivated and provide them a good working environment and this will have a positive impact on the business and may result in business growth or it become more successful.

### 2.1.1 Identification of the problem

The problem this project is attempting to solve is the management of employees in a business and to make tasks easier for human resource managers by automating them by developing a HRIS system. so that they can be more efficient in the decision-making process. There are multiple HRIS systems in the market but the problem with those systems is that either they are too complicated for user or there are less functionalities so with this project I will attempt to solve this problem by providing a user friendly HRIS system with the functionalities that are required by the HR managers.

## 2.2 Business objectives

The business may have multiple goals but one of the main goals of the business would be to have an effective human resource management department that manages employees to provide a good performance culture within the business. And To achieve this business goal the following business objectives should be accomplished.

* Automate some of the tasks done by employees to make them more efficient
* Provide human resource managers with analytic data to make important decisions for the betterment of the business
* To manage staff more efficiently and in an easy way
* To have a good communication between management and employees
* To motivate employees and provide a good working environment
* To ensure that organization resources are used efficiently
* To have accurate data within the organization

# 3. Project Objectives

At the end of this project, my goal is to provide a working user-friendly human resources information system that has the functionalities required to help the human resource managers and the objectives of this project are:

1. Identify what are the functionalities that the human managers need to manage task easily.
2. Identify what are the tasks done human resource managers that could be automated.
3. To provide a way to improve the communication between the employees and the management.
4. Create a good working environment for the employees with less arguments and fights within the organization.
5. To make the decision-making process of human resource managers easier using analytic data.
6. To keep the employees up to date on what is happening in the business and when it is happening.
7. To provide a way to manage employees effectively within the business.
8. To Provide self-service capabilities for employees in the business.

# 4. Project scope

1. Identify what are the human recourses information systems in the current market and find what are the positives and negatives of these systems
2. Identify the human resource process what the human resource managers need to make decisions using questioners
3. The proposed system will allow:
   1. HR managers to get the attendance of each employee and find out the days the employee did not come.
   2. HR managers and employees should be able to mark attendance using this application
   3. HR managers to make decisions effectively by using the graphs provided by the application.
   4. HR managers to manage and change details about the current employees
   5. HR managers to add and remove the employees that are currently in the system.
   6. HR managers to send notifications to the employee in the organization
   7. HR managers and employees to talk to each other using the chat facilities
   8. Employees to request for a holidays and other requests
   9. Employees to see how many holidays they have left for the year
   10. Employees and HR managers should be able to change some of their personal details and their profile picture.
   11. HR managers to manage the hiring process
   12. Employees to review other employees in the same department
   13. HR managers should be able to add events to the calendar and employees can see them.
   14. HR managers should be able to add task to each other within the human resource management department
   15. HR managers will be able to fill and submit different kind of forms.
   16. HR mangers should be able to add new policies and edit existing policies
   17. HR managers should be able to accept and refuse forms submitted by employees.
   18. HR managers and employees should be able to change the passwords to their account in the system.
   19. HR managers should be able to add bonuses and increase salary of employees.
4. A mobile application will also be developed for the employees and the human resource managers
5. The system will use machine learning and provide a suggestion to human resource managers which employee should receive the raise and when they should receive it.

# 5. Languages and technologies utilized

## 5.1 Initially planned technologies

In the beginning of the project the plan was to do a human resource management system which will be a desktop application and was planned to use java as the programming language with firebase as the database but after doing some research and getting the plan revised from the supervisor, I came to know that most enterprise applications are web based and has a mobile app to it. So as a result, these technologies was not used to do the human resource management system and this planned was cancelled.

## 5.2 The final technologies used

When searching for programming languages to do a web and a mobile application I got to know the concept of PWA or also known as progressive web apps where the same code based is used to develop mobile and web applications which met my need to develop the human resource management system. So, the best combination and most recommended of languages to do a progressive web app was by using Angular and ionic framework for the front end and then using node.js and express as the back end and mongoDB for the database which would form the MEAN stack. But I wanted to use firebase for its cloud functions and some of the other key functions. So, for this project I used Angular and ionic for the front end and node.js and express for the backend and finally the firebase database as my database. I also made use of the tensorflow.js library for my machine learning purposes within the project. Because it was one of the best technologies that could be used to add machine learning to the project by using JavaScript programming language.

### 5.3 Background information on Languages used

* Ionic Framework: Ionic framework is an open-source hybrid mobile development SDK that is used to develop progressive web apps and native apps too. It makes use of typescript and is ideally build on top of angular to provide wonderful progressive web apps.
* Angular Framework: According to (Angular, 2021) Angular is a platform and framework for building single-page client applications using HTML and TypeScript. Angular framework is most known for its Single page application capabilities is one of the main reasons why angular is commonly used. The single page application is the process when only a single page is loaded initially and then the part of these page changes according to the change, we make rather than the entire HTML page been reloaded.
* Node.js: According to (Node.js - Introduction - Tutorialspoint, 2021) Node.js is an open source and a cross-platform runtime environment that is used for developing a server-side and networking applications. In addition, Node.js applications make use of the JavaScript language. Some features of node.js include no buffering and very fast since it is built on Google Chromes JavaScript engine.
* Firebase: Firebase is a platform that can be used for multiple functionalities rather than just the database. This platform is developed by google and provide multiple functionalities some of them include hosting, storage, real-time database and Firestore. But in this project, we will only be using a small amount its functionalities which storage, real-time database and the firestore. Firebase is preferred by most people is because of its ability to scale and the functions it provides. Firebase also contains a full documentation on each of its functionalities which widely beneficial for software engineers when using firebase as their database or to do any other requirement.

# 6. Research Results

## 6.1 Research of the Project

### 6.1.1 Brief

Research part of a project is crucial to a project success and its quality. Because of those reason and couple more an extent research was done in this project for over a course of three to four weeks to find each and important factor that may influence the project, to learn about the Human resource management, to identify existing systems and their issues, to identify the functionalities required by human resource managers and to find the perfect technologies and programming languages to be used to do this project. Some of the research methods are mention below along with what I learned with each research type and how they affected the project.

### 6.1.2 Questioner

One way the research was done was through questioners to identify whether the people know what a HRIS system is and to know whether they think it is useful to the organization. The Questions were aimed for HR mangers or undergraduates who are doing Human resource management, but the questioners were also distributed to the public to understand what they think about HRIS systems. The questioner was a success and received around 52 response and from those response 43 people had past working experience, 6 people were working and 3 had no working experience and due to these various responses, that was received a large amount of valuable information was gathered. One of those interesting results were that almost 31 of those responses said that having a good HRIM system can affect the working environment for employees. And another one was when asked what are things that is wrong with current HRIM systems the majority answers stated that the functionalities were not enough and there is no proper communication between employees and Human resource managers. Much more information such as those were gathered through the questioners.

### 6.1.3 Interviews

The other method used to gather information on Human resource management and the HRIS systems was using the interviews method. Even though substantial amount of information was gathered from questioner’s I could not ask questions which needed detailed answers so during the interviews this was possible. But an issue I ran into was because of the pandemic situation in the country the universities and business have been closed. so, I was not able to get interviews from industry professionals so the candidates I interviewed was mainly undergraduates who are in the final year and are doing human resource management as their degree. I was able to get 6 interviews done and gained a valuable information that was useful for the development of the application. Some of the main questions that were asked was what were the main documents that are submitted by human resource managers, what are the tasks that Human resource managers find boring or tiering. These were just some of the questions that was asked during the interview, the responses I got from them was greatly beneficial for the research.

### 6.1.4 Conclusion

Questioners and interviews were not the only methods used to do research on Human resource management and HRIS systems in addition to those methods online articles were also used to do the research for the project. Articles were mainly used to identify the tasks and responsibilities that the human resource managers have, and this was done so that I can understand and determine whether the functionalities specified in the interviews is a need to have functionality or want to have functionality and I then can assess on them. These different techniques of collecting information help me to get to know more about human resource managers responsibilities and to identify the functionalities they need in a human resource information system.

## 6.2 Research on Existing Systems

There are numerous existing human resource management systems and during my research I came to know their different types of human resources management systems as well and they are HCM which means Human Capital management system, HRMS which means Human Resources management systems and finally the system type developed in this project which is HRIS Systems. HRMS systems only cover the payroll, time and labor and there are numerous systems available for this type and is the most common type of human resource management system used in low level business. Next is the HCM covers everything in HRMS and some additional functionalities like analytics and so on. Finally, HRIS systems cover everything and has additional functionalities. There are numerous HRIS systems and HCM systems but during the questioner and the interview I found out that they do not have enough functionalities to help Human resource managers. Furthermore, during the interviews, a common thing that was mentioned was that some more functionalities could be added to the existing HRIS systems that are used by businesses. In addition, in Sri Lanka only the high-level companies use HRIS systems, but the employees and the human resource managers believe use of HRIS systems can improve the working environment of a business.

## 6.3 Research Technologies & Languages

### 5.3.1 Currently used technologies

Since I will be using ionic and Angular frameworks for the front-end of the project and node.js and express to the backend of the project a thorough research was needed to be done in order to understand the limits, the advantages and the disadvantages of using these languages. Because I wanted to avoid impactfully surprises during the development of the project which could negatively affect the project. One of the main things that I looked into was the versions document of each framework and identified how much each version changes and what are things that will probably change in the next version of the framework because in the case of a version update my previous code wouldn’t work if that functionality is removed or changed. I did not do that much of a research for firebase because I have used Firestore before and new it was reliable and dramatic changes would not occur. This was done to ensure that project could be carried out smoothly without any issues

### 6.3.2 Technologies that will be used in the future

In the coming days I plan to make use machine learning for this project to increase the functionalities of the system and to satisfy the users. So, to add machine learning I will be using Tensorflow.js which is a JavaScript library that will allow me to develop machine learning models in JavaScript and allow me to either use machine learning directly in the browser or in my back end which is the node.js.

### 6.3 Reviews on the developing application

To identify whether my application is user friendly and has the key functions implemented in a manner that will be easy for the users a review session was done. The reviews were obtained from my supervisor, from some of my colleagues and from some human resource managers I personally knew. During these review sessions I was able to get a clear idea of the things they liked and disliked in my application and they even gave ideas oh how to improve some functions and I also got to know the functionalities that I missed that should be implemented.

# 7. Learning Undertaken

In this project there was large learning curve mainly due to the fact I did not know some of the languages that was used in the project because I have not used these languages before. During the research I found out using these languages were the best way to develop the system I planned for. So, to get the knowledge I had to be learn them from the beginning. In the database I did have some experience in using the fire store and NO SQL databases but not the real time database, so I had to learn about that section also. One of the greatest challenges were learning about machine learning and about how to implement them. Multiple machine learning courses were done in linked in learning and Udemy courses to get the basics of machine learning and understand the concepts. Next, I had to learn how to use machine learning in my project and once I came across tensorflow.js through research I started doing an online course on it as well.

In addition to that I also had to learn about node.js which was used for the backend. In the begging my plan was to use firebase API to do the backend part as well because since the tensorflow.js could be done in the front end itself and since there was firebase API a backend was not exactly planned. But during the development I learned that to do some firebase functions you need to use firebase admin SDK and the only way to implement admin SDK was by using a backend so because of that reason I had to learn node.js for the backend part of the application. So, like I did for tensorflow.js I followed multiple tutorials to learn about node.js since this would be my first time using it. During this learning process I learned how much node.js would improve my application and the numerous benefits it brings to my application.

These two were the largest and key things I had to learn for me to do this project to make it a successful project. In addition to those two major learning tasks there were minor learning also done one of them being the ionic framework. But since I had experience with angular, I did not have much of a learning curve there since it is kind of make use of the same logic. These were the learning undertaken for the project and learning these key things made the project much better and into a successful project.

# 8.Architectural Diagrams

## 8.1 Activity Diagram

Diagram, engineering drawing

Description automatically generated

Figure 8.1: Activity Diagram

## 8.2 Use Case Diagram

Diagram

Description automatically generated

Figure 8.2: Use Case Diagram

## 8.3 Context Diagram

Diagram

Description automatically generated

Figure 8.3 Context Diagram

## 8.4 Sequence Diagram

Calendar

Description automatically generated

Diagram

Description automatically generated

Figure 8.4: Sequence Diagram

## 8.5 Tree representation of hierarchical modal of firebase database

Diagram, engineering drawing

Description automatically generated

Figure 8.5 Hierarchical modal tree representation

When developing the hierarchical modal for the Firestore database some key instructions were followed because these were the rules set by firebase and While others were the rules followed by NoSQL databases. One of the main one was that there should be a collection and then the document which contains the fields and data. So, the way multiple collections could be made was by either having a collection then a document and repeating the process or by having a collection then a document then a collection within a document and then multiple documents.

# 9. Project status

## 9.1 Progress

The initial planning stage started began even before the project was assigned and during that time research was being done on the languages that is best suitable for the project and what are the existing human resource information management system that are available in the market and what their functionalities were. The development of the project initially began in November of 2020. The development began as soon as the research was completed to meet the strict time schedule met by me.

### 9.1.1 Progress before first Interim report

During this time certain number of tasks were completed. In the month of November almost 35% of the development was completed and was going in track according to the initial project plan mentioned in the project initiation document. But in December due to certain risk that affected the project such as schedule over run only 5% of the development work was able to be completed. Currently some of the functionalities that have been completed from the system includes authentication of users, notices, chat system and the event calendar which will be displayed in the video submitted.

### 9.1.2 Progress before second interim report

During this time certain key task were completed. And I was able to complete almost 20% of the project within a time span of one month. Initially before the first interim report I had only completed about 40% of the overall project and now I have completed about 60% of the entire project and is in track according to the updated project plan. Some of the task that was completed before the second interim report was the attendance, some components in dashboard, profile, uploading images to Firestore in the database, some backend components and much more.

### 9.1.3 Progress Tracker

#### 9.1.3.1 Brief

The table below shows the progress of my entire project, but the project is broken down into small tasks to identify what the progression of each task is, this table will allow me to make assessments on which task should I focus on the most and to identify whether I can complete all the tasks before the deadline. The table below clearly shows how much percentage of each task is completed before the first and second interim report and how much percentage is left for me to work on before the final deadline of the project.

#### 9.1.3.3 Progression of each task

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Description | Completed percentage before first interim report | Completed percentage before second interim report |
| Design all the HR mangers pages | This includes identifying and designing all the pages for Human resource managers. | 80% | 100% |
| Design all the employee’s pages | This includes identifying and designing all the pages for employees. | 60% | 100% |
| Implement Authentication for the application | This includes all the authentication parts such as login and routing part of the application | 90% | 100% |
| Design the architecture and create a database | This includes identifying all the fields that are required then designing the architecture and finally creating all those collections in firebase. | 100% | 100% |
| Complete Managers user pages | This includes all the functionalities and pages that is available for human resource managers. | 63% | 80% |
| Complete employee’s user pages | This includes all the functionalities and pages that is available for employees. | 10% | 40% |
| Complete the machine learning functionalities | This task includes the machine learning part of the application. | 0% | 10% |
| Testing process of the application | This task includes the testing progress of the entire application and bug fixes in the application. | 35% | 48% |

Table 9.1: Progression table

## 9.2 Testing and Quality

The testing has been completely done for the 48% of the development that has been completed and during this testing multiple bugs and errors were found and resolved. The quality is ensured in the completed part of the project because I was able to get opinions from couple undergraduates who are studding Human resource management, according to their response they find the functionalities useful and easy to use.

## 9.3 Future Development

The project development being only 60% completed and there is 40% more to be done within the timespan of one and half month according to my updated project plan. Among the functionalities that is yet to be developed machine learning would be the one that word take the most amount of time and will be hard to implement so it will be done last after building the core functionalities of the system. Some of the main functionalities that is yet to be completed are graphs, employee management, and salary management.

# 10.The Application

## 10.1 Screen shots & explanation of the application

A screenshot of a computer

Description automatically generated with medium confidence

Figure 10.1: Login page

This is the login page and the first page that will be displayed to the users here they have to enter their details to login to the system. In the login page the way the managers and employees are identified is by their email and according to that they will be routed to their specific dashboard.

A screenshot of a computer

Description automatically generated with medium confidence

Figure 10.2: Dashboard

This is the managers dashboard page once the managers login through the login page they will be routed here and, in the dashboard, it provides buttons to some of the most used functionalities and also provide information.

A picture containing text, indoor, black, screenshot

Description automatically generated

Figure 10.3: Event Calendar

This is the managers event calendar page here it shows the calendar, and the manager can view it in any form he wants he can see it from month, week, and day view. It shows all the events that are added to the event calendar along with the start time, end time and the small description of the event.

A computer screen capture

Description automatically generated with medium confidence

Figure 10.4: Add events

This part is in the calendar events page and this is where the human resource managers can add events which will be displayed in the above event calenda for employees and the managers to see.

A screenshot of a computer

Description automatically generated

Figure 10.5: Chat lobby

When the human resource manager clicks on the chat from the menu or from dashboard they will be routed to this page, here it shows all the departments available in the organization and all the employees in the organization will be categorized under one of this departments, then the human resource manager can select a department and message to the employees who are in that specific department.

A picture containing text, screenshot, monitor, indoor

Description automatically generated

Figure 10.6: Chat group for HR Managers

This is the messaging area for human resource managers. once the human resource managers have selected a department then can send messages from here, when a message is sent it shows the message, the senders e-mail, the time the message was send and also the date on when the message was sent.

A picture containing text, monitor, screenshot, indoor

Description automatically generated

Figure 10.7: Add Notices

This is the notices page, and this is the page where managers use to add notices in the application which will be displayed in the dashboard of the user. There are three types of notices urgent notices, Important notices and formal notices and the user can add on of these 3 types of notices to the application.

A screenshot of a computer

Description automatically generated

Figure 10.8: Documents page

This is the document page here it shows all the documents and request forms submitted by human resource managers and by employees, human resource managers can view the submitted documents and then they can either refuse the document or accept it. They can also approve a denied document or just permanently delete the denied document.

A screenshot of a computer

Description automatically generated

Figure 10.9: Add documents

When the user clicks add document button the following modal pops up and it shows all the different types of documents they can add and once a user clicks a document, they will be taken to that particular form to add the document to the document page where it later gets accepted or denied. Since there like documents all those documents will not being show on the report, but each document is different from the other and has specific fields which the user should fill to submit the document.

A computer screen capture

Description automatically generated with low confidence

Figure 10.10: Users Page

This is the add new user page here it shows all the employees and human resource managers in the system. From this page the human resource managers can remove existing managers and human resource managers from this system. They can create new users by clicking the add new user button.

A computer screen capture

Description automatically generated with medium confidence

Figure 10.11: Add Users

The human resource managers can add new users to the system these users can either be employees or newly hired human resource managers that are not in the system. Once they fill this form the user will be created in the system.

A computer screen capture

Description automatically generated with medium confidence

Figure 10.12: Add Policies

Policies is an important part of the organization because it defines the rules of the organization and these policies change overtime, and also new policies will be added to the organization overtime and it’s the task of human resource managers to add them, so in this page the human resource managers can add new policies and also edit existing policies and these policies will be displayed to the employees.

A computer screen capture

Description automatically generated with low confidence

Figure 10.13: Attendance

In the page shown above the human resource managers can create new QR Code and delete old QR Code and whatever the QR code created by the HR managers should be used by the employees to mark attendance for the day, once the employees mark attendance it will be shown to the human resource managers in the above table with the user’s company email address and the time and date the employee scanned the QR Code. The user can use this application to scan the QR Code by clicking the mark attendance tab which contains an inbuild QR- code scanner. Once the user scans and the QR Code and the scanned QR Code matches with QR – Code created by HR manager, then the user must enter the password to mark the attendance.

A screenshot of a computer

Description automatically generated with medium confidence

Figure 10.14: User profile

This is the profile page and here it shows the user all their account details and the profile picture. The users can change certain amount personal details by clicking the edit profile button and, they can also change the password by clicking change password which will open a modal but to ensure security within the system the user must enter the old password to change the password. The user can also change their profile by clicking change profile picture and the new picture they put will be stored in firebase storage and updated in in Firestore to display it in the profile page.

Graphical user interface, text, application, email

Description automatically generated

Figure 10.15: The firebase database

This is the firebase database used for this project and when developing this database, the hierarchical modal was used to ensure that this database is developed I a proper easy to access manner.

### 10.1.1 Extra Information

In addition to the screenshots of the system that is shown above there are much more pages and modals within the developed system those include different types of forms and sub-pages. What is displayed above are the main pages along with a small description on how each of these pages function. The screenshots of the pages above are from both the users which are human resource managers and the employees.

## 10.2 Code Snippets from the application

### 10.2.1 Brief

The section below shows some screenshots of code snippets and contain a small description on what each of them does. The entire code base will not be added to the report because then it will turn it to a massive report and would not be an affective report, so instead some of the code snippets will be shown under the sections below which are separated into two sections called the front-end code snippets which contain front end code and back end code snippets which will contain back end code.

### 10.2.2 Front-end code snippets

Text

Description automatically generated

Figure 10.16: Update profile function

What the above code is used is for changing the password of the user. The way it works is that it takes the gets the old password from the database and decrypts it and then when the user enters the old password it checks whether the user entered old password is similar to the password in database and if the passwords are similar then the user entered new password is sent to the backend to change the password and the user is alerted with a message and if the old password entered by user does not match the password of the database then a error message is show to the user.

Text

Description automatically generated

Figure 10.17: QR-code scanner

Text

Description automatically generated

Figure 10.18: QR-code scanner

A picture containing graphical user interface

Description automatically generated

Figure 10.19: QR-code scanner

The three images above show how the QR- code scanner works. The QR- code scanner is used by the employees and the managers to scan the QR code and if the scan is successful the attendance of the user will be recorded. The way it works is that at first, we access the camera of the device this can be the web cam of the computer or the camera of the phone and then we show the user the live video of what the camera sees so that the user can point to a QR Code and once a QR code is detected by the camera it scans the QR code and gives us the result. The QR Code is detected by using the package @ionic-native/barcode-scanner which is available in ionic and should be installed using npm install. So, getting the result is not enough so what I did was I check the result taken from QR code and check where it matches to the QR-code generated by the manger which is there in the database and if the QR codes are similar then the attendance is recorded else it shows an error message to the user.

### 10.2.3 Back-end code Snippets

Text

Description automatically generated

Figure 10.20: Update profile function

What the above code does is it gets the data from the front end and then uses the user id of the employee to find his records and then updates the user details with the details received by the front end. And if the task is successful it sends a success message to the front end and also consoles it in the terminal and if it fails the same thing happens but sends a failure message along with the reason why it might have failed

Text

Description automatically generated

Figure 10.21: Add person function

What the above code does is it allows the human resource managers to add new users to the system. The way it works is similar to the above code snippet it gets the data from the front end and creates a new user with a unique user id and then if the task is successful sends a message to the front end and also consoles it and if it fails it sends a error message to the front end alone with what the error is and also consoles the result in the terminal.

# 11. Risks

## 11.1 Risk plan

|  |  |  |
| --- | --- | --- |
| **Risk Plan** | | |
| **Risk** | **Probability of Occurrence** | **Management Strategy** |
| Schedule overrun | High | To avoid running into this issue a clear plan is made when each stage of the incremental approach should be completed, and I plan to discuss with my supervisor to let him know my progress and get his option whether I could manage the work with the current project scope. |
| Acts of God | Low | In the case of an event as such then the development of the application would not be affected because it will be backed up and so the development could continue from where I left off. |
| Technical difficulties | Moderate | To avoid the entire project been lost due to technical failures a GitHub repository will be created and maintained so that each time a change is made to the project it can be updated to the GitHub. |
| Trouble learning required development technologies | Low | To avoid this a proper research was done during the planning phase and determined whether it was capable doing the project with the suggested technologies and checked whether there is enough documentation and tutorial if I run into any issue during the project. |
| Scope creep | High | To avoid the project scope from growing after the project plan a strict project scope will be followed to avoid getting sidetracked from the initial project scope. |
| User acceptance | Low | User acceptance is one of the most important things and to make sure that human resource managers will like the product a questioner will be made to check what they need, and the systems user friendliness. In addition, I will get my supervisors opinion on the application. |

Table 11.1: Risk Plan

## 11.2 Risk Encountered

During the development of the project two main risk impacted the project but since those risks were identified and a plan was made on the project initiation document, they did not have a huge impact on the project. The risks that impacted and how they affected the project is mentioned below.

The first risk that occurred and impacted the highest was schedule over run. Even though I created the project plan giving time for the other projects and submissions. I did not correctly anticipate the time it would take to complete the other projects and the other reason was I came across some major bugs in the system which took a large time to identify and fix. So due to these reasons my scheduled was overrunned by work and I missed certain deadlines I kept for myself within this project and due to this I had to create a new project plan that puts the project completion data a little behind than the initial plan.

The second and last risk that occurred was technical issues, even though this could have been a major issue but since I identified it and managed this issue by using version control software like GitHub it did not affect a lot because I uploaded to GitHub at least twice a week once I complete any part of the project due to this, I didn’t lose any part of the project and was able to get back to work once my device was fixed.

# 12. Quality Plan

When developing a project quality is one of the essentials things that should be considered because it is one of the main things that a customer looks for in a product and due to poor quality, the customer may even reject the entire application. So, to ensure that this project provides a good quality HRIS system the following quality checks will be done, and these strategies will be used to do these checks, so if these quality checks are done in a proper way then the quality of the system can be ensured.

|  |  |
| --- | --- |
| **Quality Plan** | |
| **Quality check** | **Strategy** |
| Major deliverables | To ensure that the major deliverables are met a plan is made on the work process so it is not rushed this will also ensure that the system has the functionalities mentioned and nothing will be missed. |
| Quality control activities throughout the project | To ensure the quality I will get a review from my supervisor after each increment of the project and during the testing period of the system |
| Sub system usability and validation | This will be done after each increment to ensure quality is maintained in the project |
| Quality assurance activities | To ensure that the quality of the application is maintained I will get the review of the quality from my supervisor after each stage. |
| Feasibility study | A feasibility study will be done on the project to ensure that the project is worth the time and effort and to show how it will benefit the business. |
| System validation and user acceptance | To ensure that the human resource managers accept the product and is also helpful to them a questioner was conducted of what they need and what they want from a human resource information system. So, it could be delivered to them. In addition, I will also get the option of my supervisor. |

Table 12.1: Quality Management Plan

# 13. Changes to the project

## 13.1 Brief

There are no huge changes to the project. The only change that will be done to the project will be a new project plan because the initial project plan was not feasible due to the risk encountered along the way, so a new project plan is made and with it the project will be able to be completed on time without any complications. The rest of the things mentioned in the project initiation document stays the same including the project scope.

## 13.2 Finalized Project plan

|  |  |  |
| --- | --- | --- |
| **Project Plan** | | |
| **Stage** | **End date** | **Products/deliverables / outcome** |
| Project Initiation | 03/11/2020 | Project initiation document |
| Research on the development area | 05/11/2020 | A clear understanding of what human resource managers need and the short comings of the current HRIS systems |
| High Level designs of the system | 10/11/2020 | Design documents that are needed for the project and graphical user interface layouts |
| Increment 1 | 10/02/2021 | Development of the functionalities for human resource managers in the web and mobile application |
| Increment 2 | 31/02/2021 | Development of the functionalities for employees in the web and mobile application |
| Increment 3 | 15/03/2021 | Integration of machine learning and some of the other functionalities |
| System testing | 23/03/2021 | Testing the entire system |

Table 13.1: Project plan

# 14. Conclusion

The current stage of the project is that the research is completely done and have a clear idea of Human resource managers, their responsibilities, and their tasks. In addition, I have a clear understanding of the functionalities that will be provided in this project. I also know and have a clear understanding of the languages and the technologies that I will be using this project. The low-fidelity diagrams are completed along with the all the architectural diagrams so now I can fully focus on the development process of the project and have a clear idea of the tasks I am doing.

The development status of the project is that only 60% is complete and I have another 40% of the development work to be done. And I believe I can finish the entire project before the project deadline set my me in the updated project plan because currently, I am on track in the updated project plan and not falling behind. So, if I continue to work in this manner, I will be able to complete the project and provide a quality functioning human resource information system that will satisfy the Human resource managers and employees needs and wants.

# 15. Appendices

## 15.1 References

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## 15.2 Proposal

**Human Resource information Management System**

**(HRIS)**

**Proposer**

Name: Nidula Nuran Wijesuriya

Index Number: 10674049

**Proposed supervisor**

Dr. Rasika Ranaweera

**Project description**

The proposed project is a human resource information management system, the human resource department is one of the crucial parts of a business because they manage the people in the organization and having an effective human resource department can have a direct positive impact on the employees which would make it a good working environment for employees and result in profit for the business. The human resource information management system or the HRIS is developed to make the tasks of human resource managers easier and make them more effective in an organization for them to make important decision for the business. There is different type of HRIS systems out there in the market, but the problem is most of them either does not provide easy to use interface for the human resource managers or does not have enough functionalities for human resource managers to make decisions effectively. But with the proposed system I aim to automate some of the task of human resource manager to reduce their workload and to make them more effective to the organization.

This proposed system will have two platforms and they will a web and mobile application and will be using the progressive web app technology to develop this proposed HRIS system, this application will be developed using ionic and angular with firebase as the database. The application will have all the things that is required to manage employees in a business and will be a user-friendly application. This HRIS system will have functionalities like time & attendance, chat capabilities, performance management, employee self-service and finally a payroll system that uses machine learning to find who should receive raises and who gets overtime payment. This system will contain these main functionalities and a few other functionalities that will make this Human Resource Information Management System different from the current HRIS systems that are currently available in the market. The main objective of the proposed system is to make the tasks of human resource managers easier and to make it a self-service system for employees while aiming to achieve the data, information, and knowledge factors that a HRIM system should have in order for it be a good human resource information management system.

**Project keywords**

Human resource managers, machine learning, Web application, mobile application, progressive web app, angular, ionic, firebase

**Requirements**

Learn ionic and angular frameworks

Learn concepts and implementations of machine learning

Learn node.js

**Finance**

None

**External organizations**

None

**Other staff**

None

## 15.3 Project Initiation Document (PID)

### 1. Introduction

#### 1.1 About us

The Project is a Human Recourse information system which is a system that is developed for the human resource managers to provide them with information and at the same time make the task of human resource managers easier and make them more effective in the business. This HRIS system is not specified to a business but can be used by any business to manage their employees, to do their HR tasks and make their human resource department effective.

#### 1.2 Introduction

The management of the human factor of an organization has been one of the main goals of a business and to do so human resource managers are hired and they have the task of training employees, performance management, organization development, safety, wellness, benefits, employee motivation and more. These tasks can be time consuming and hard to manage so the Human Recourse Information systems or also known as HRIS systems were introduced to the human resource managers. A research done by (Hussain, Wallace and Cornelius, 2020) states that the HRIS systems are used by human resource professionals to make strategic decisions no matter the size of the business and says that this has added value to the company and increased the status of the human resource profession. These HRIS systems are used to make the task of human resource managers easier and manageable. In addition, some HRIS systems have automated some of the tasks done by the human resource managers so that they could be more effective and focus on decision making for the betterment of the business.

### 2. Business case

#### 2.1 Business needs

There are several factors that affect the business it may be in a positive way or else a negative way but what decides this outcome depends on how the business manages these factors. The employees of the business are one of the main factors that can have a huge impact on the organization, so the business needs to manage it in a proper manner. According to (Balyuk, 2020) Management of employees is important because the company is made up of people with different ages, customs and profiles and managing them is crucial to the success of the business and she also states that if they are managed in a proper manner it could provide benefits like good working environment, employee development, Increased productivity and motivation and finally business objective alignment. So, what the business needs is a user friendly HRIS system that has the functionalities required for management of employees and reduce the mundane tasks of human resource managers. A good HRIS does not just help the business and HR managers it also helps the employees working in the organization making them more motivated and provide them a good working environment and this will have a positive impact on the business and may result in business growth or it becoming more successful.

##### 2.1.1 Identification of the problem

The problem this project is attempting to solve is the management of employees in a business and to make tasks easier for human resource managers by automating them by developing a HRIS system. so that they can be more efficient in the decision-making process. There are multiple HRIS systems in the market but the problem with those systems are either too complicated for user or there are less functionalities so with this project I will attempt to solve this problem by providing a user friendly HRIS system with the functionalities that are required by the HR managers.

##### 2.1.2 Analysis of the problem

To identify what are the main issues that a HR manager have, the task that could be automated and to determine what information would help the human resource managers to make decisions a questionnaire was done. The target people of the questionnaire was the HR managers, students or anyone who has seen or used HRIS systems, I received fifty plus response from all the target people providing me with information on how happy they are with current HRIS systems, what functionalities a HRIS system should have, the problems they face as HR managers and more. These responses were not one sided but one main thing that all recipients agreed was that Human resources information management systems will improve the effectiveness of Human resource managers and benefit employees. In addition, provide a good performance culture in the business.

#### 2.2 Business objectives

The business may have multiple goals but one of the main goals of the business would be to have an effective human resource management department that manages employees to provide a good performance culture within the business. And To achieve this business goal the following business objectives should be accomplished.

* Automate some of the tasks done by employees to make them more efficient
* Provide human resource managers with analytic data to make important decisions for the betterment of the business
* To manage staff more efficiently and in an easy way
* To have a good communication between management and employees
* To motivate employees and provide a good working environment
* To ensure that organization resources are used efficiently
* To have accurate data within the organization

### 3. Project Objectives

At the end of this project, my goal is to provide a working user-friendly human resources information system that has the functionalities required to help the human resource managers and the objectives of this project are:

1. Identify what are the functionalities that the human managers need to manage task easily.
2. Identify what are the tasks done human resource managers that could be automated.
3. To provide a way to improve the communication between the employees and the management.
4. Create a good working environment for the employees with less arguments and fights within the organization.
5. To make the decision-making process of human resource managers easier using analytic data.
6. To keep the employees up to date on what is happening in the business and when it is happening.
7. To provide a way to manage employees effectively within the business.
8. To Provide self-service capabilities for employees in the business.

### 4. Initial scope

1. Identify what are the human recourses information systems in the current market and find what are the positives and negatives of these systems
2. Identify the human resource process what the human resource managers need to make decisions using questioners
3. The proposed system will allow:
   1. HR managers to get the attendance of each employee and find out the days the employee did not come
   2. HR managers to make decisions effectively by using analytic and statistic data
   3. HR managers to manage and change details about the current employees
   4. HR managers to add and remove the employees that are currently in the business
   5. HR managers to send notifications to the employee in the organization
   6. HR managers and employees to talk to each other using the chat facilities
   7. Employees to request for a holidays and other requests
   8. Employees to see how many holidays they have left for the year
   9. Employees to change some of their personal details
   10. HR managers to manage the hiring process
   11. Employees to review other employees in the same department
   12. HR managers should be able to add events to the calendar and employees can see them
   13. HR managers will be able to fill and submit different kind of forms
   14. HR managers to add bonuses and increase salary
4. A mobile application will also be developed for the employees and the human resource managers
5. The system will use machine learning and provide a suggestion to human resource managers which employee should receive the raise and when they should receive it.

### 5. Method of approach

The development process of system will take use of the incremental approach, The reason the incremental approach was chosen over the other approaches was because with the incremental approach I will be able to make changes throughout the development process after getting a respond to the each iteration and also the errors are easy to find. The incremental approach will have 3 increments. The first increment is the development Human resource manager functionalities for the web and mobile application. The second increment is the development of employee functionality for the web and mobile application. And finally, the third increment is the integration of machine learning and some of the other functionalities.

The web and mobile application will be developed using the above approach but what the technologies that will be used is not yet confirmed but these are some of the possible technologies that will be used, and they are Angular, Ionic, Nodejs and firebase which is a real time database.

### 6. System Design

Diagram

Description automatically generated

Diagram 1: The use case diagram

### 7. Project plan

|  |  |  |
| --- | --- | --- |
| **Project Plan** | | |
| **Stage** | **End date** | **Products/deliverables / outcome** |
| Project Initiation | 03/11/2020 | Project initiation document |
| Research on the development area | 05/11/2020 | A clear understanding of what human resource managers need and the short comings of the current HRIS systems |
| High Level designs of the system | 10/11/2020 | Design documents that is needed for the project and graphical user interface layouts |
| Increment 1 | 01/12/2020 | Development of the functionalities for human resource managers in the web and mobile application |
| Increment 2 | 20/12/2020 | Development of the functionalities for employees in the web and mobile application |
| Increment 3 | 31/01/2021 | Integration of machine learning and some of the other functionalities |
| System testing | 12/02/2021 | Testing the entire system using the component testing method |
| completion of final report | 15/03/2021 | Final report of the project |

Table 1: Project Plan

### 8. Stage Management

#### 8.1 control plan

The PRINCE2 techniques will be used to properly control the project so that the required project goal and objectives could be achieved. The PRINCE2 techniques that will be used are the end stage reports after each increment, review of the stage with the supervisor, highlight reports, risk management, quality plan, communication plan and exception reports where they are required.

#### 8.2 communication plan

To maintain a good communication throughout the project there will be multiple supervisor meetings and these meetings will be used to discuss the progression of the project, next stage of the plan, end stage report and feedbacks meetings will be held. In addition to mentioned meetings the necessary meetings will also be held.

### 9. Initial risk list

During the development of a project there are risks that are undertaken or problems that might occur and these risks should be managed during the planning process of the project so that when the particular risk occurs then we know what has to be done. And having a risk analysis can sometimes determine the success and failure of a project. During the risk analysis of the project these were the risk that was identified for this project.

|  |  |  |
| --- | --- | --- |
| **Risk Plan** | | |
| **Risk** | **Probability of Occurrence** | **Management Strategy** |
| Schedule overrun | High | To avoid running into this issue a clear plan is made when each stage of the incremental approach should be completed, and I plan to discuss with my supervisor to let him know my progress and get his option whether I could manage the work with the current project scope. |
| Acts of God | Low | In the case of an event as such then the development of the application would not be affected because it will be backed up and so the development could continue from where I left off. |
| Technical difficulties | Moderate | To avoid the entire project been lost due to technical failures a GitHub repository will be created and maintained so that each time a change is made to the project it can be updated to the GitHub. |
| Trouble learning required development technologies | Low | To avoid this a proper research was done during the planning phase and determined whether it was capable doing the project with the suggested technologies and checked whether there is enough documentation and tutorial if I run into any issue during the project. |
| Scope creep | High | To avoid the project scope from growing after the project plan a strict project scope will be followed to avoid getting sidetracked from the initial project scope. |
| User acceptance | Low | User acceptance is one of the most important things and to make sure that human resource managers will like the product a questioner will be made to check what they need, and the systems user friendliness. In addition, I will get my supervisors opinion on the application. |

Table 2: Risk Management Plan

### 10. Initial quality plans

During the development of a project quality is one of the essentials things that should be considered because it is one of the main things that a customer looks for in a product and due to poor quality, the customer may even reject the entire application. So, to ensure that this project provides a good quality HRIS system the following quality checks will be done and these strategies will be used to do these checks, So if these quality checks are done in a proper way then the quality of the system can be ensured.

|  |  |
| --- | --- |
| **Quality Plan** | |
| **Quality check** | **Strategy** |
| Major deliverables | To ensure that the major deliverables are met a plan is made on the work process so it is not rushed this will also ensure that the system has the functionalities mentioned and nothing will be missed. |
| Quality control activities throughout the project | To ensure the quality I will get a review from my supervisor after each increment of the project and during the testing period of the system |
| Sub system usability and validation | This will be done after each increment to ensure quality is maintained in the project |
| Quality assurance activities | To ensure that the quality of the application is maintained I will get the review of the quality from my supervisor after each stage. |
| Feasibility study | A feasibility study will be done on the project to ensure that the project is worth the time and effort and to show how it will benefit the business. |
| System validation and user acceptance | To ensure that the human resource managers accept the product and is also helpful to them a questioner was conducted of what they need and what they want from a human resource information system. So, it could be delivered to them. In addition, I will also get the option of my supervisor. |

Table 3: Quality Management Plan

### References

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### Appendix

#### 1. Questioner

Graphical user interface, text, application

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Image 1: Of Questioner

Graphical user interface, text, application

Description automatically generated

Image 2: Of Questioner

Graphical user interface, text, application, chat or text message

Description automatically generated

Image 3: Of Questioner

Graphical user interface, text, application, chat or text message

Description automatically generated

Image 4: Of Questioner

## 15.4 Interim Report 1

### 1. Introduction

The Project is to develop a HRIS system or also known as the Human resource information system, the system will be available as web app and as a mobile app for mobile phones, this is to improve the user experience and making it convenient for users to access the application whether they are in the office or not. This application will be mainly used by Human resource managers to manage the employees in the business in an effective and efficient manner. The HRIS systems main goal is to make the tasks of human resource manager easier and faster so that they can spend more time making strategic decisions to improve the business. Another main objective of this system is to improve the communication within the business so to do so this system has an employee’s interface of software added which allows employees to submit request forms, chat with others and much more. To develop this project the incremental approach is used because of its ability to allow me to make changes to the development within the increment and because of its other advantage which is the errors are easy to find when compared with the other types of approaches.

### 2. Research Results

#### 2.1 Research of the Project

##### 2.1.1 Brief

Research part of a project is crucial to a project success and its quality. Because of those reason and couple more an extent research was done in this project for over a course of three to four weeks to find each and important factor that may influence the project, to learn about the Human resource management, to identify existing systems and their issues, to identify the functionalities required by human resource managers and to find the perfect technologies and programming languages to be used to do this project. Some of the research methods are mention below along with what I learned with each research type and how they affected the project.

#### 2.1.2 Questioner

One way the research was done was through questioners to identify whether the people know what a HRIS system is and to know whether they think it is useful to the organization. The Questions were aimed for HR mangers or undergraduates who are doing Human resource management, but the questioners were also distributed to the public to understand what they think about HRIS systems. The questioner was a success and received around 52 response and from those response 43 people had past working experience, 6 people were working and 3 had no working experience and due to these various responses, that was received a large amount of valuable information was gathered. One of those interesting results were that almost 31 of those responses said that having a good HRIM system can affect the working environment for employees. And another one was when asked what are things that is wrong with current HRIM systems the majority answers stated that the functionalities were not enough and there is no proper communication between employees and Human resource managers. Much more information such as those were gathered through the questioners.

#### 2.1.3 Interviews

The other method used to gather information on Human resource management and the HRIS systems was using the interviews method. Even though substantial amount of information was gathered from questioner’s I could not ask questions which needed detailed answers so during the interviews this was possible. But an issue I ran into was because of the pandemic situation in the country the universities and business have been closed. so, I was not able to get interviews from industry professionals so the candidates I interviewed was mainly undergraduates who are in the final year and are doing human resource management as their degree. I was able to get 6 interviews done and gained a valuable information that was useful for the development of the application. Some of the main questions that were asked was what were the main documents that are submitted by human resource managers, what are the tasks that Human resource managers find boring or tiering. These were just some of the questions that was asked during the interview, the responses I got from them was greatly beneficial for the research.

#### 2.1.4 Conclusion

Questioners and interviews were not the only methods used to do research on Human resource management and HRIS systems in addition to those methods online articles were also used to do the research for the project. Articles were mainly used to identify the tasks and responsibilities that the human resource managers have, and this was done so that I can understand and determine whether the functionalities specified in the interviews is a need to have functionality or want to have functionality and I then can assess on them. These different techniques of collecting information help me to get to know more about human resource managers responsibilities and to identify the functionalities they need in a human resource information system.

#### 2.2 Research on Existing Systems

There are numerous existing human resource management systems and during my research I came to know their different types of human resources management systems as well and they are HCM which means Human Capital management system, HRMS which means Human Resources management systems and finally the system type developed in this project which is HRIS Systems. HRMS systems only cover the payroll, time and labor and there are numerous systems available for this type and is the most common type of human resource management system used in low level business. Next is the HCM covers everything in HRMS and some additional functionalities like analytics and so on. Finally, HRIS systems cover everything and has additional functionalities. There are numerous HRIS systems and HCM systems but during the questioner and the interview I found out that they do not have enough functionalities to help Human resource managers. Furthermore, during the interviews, a common thing that was mentioned was that some more functionalities could be added to the existing HRIS systems that are used by businesses. In addition, in Sri Lanka only the high-level companies use HRIS systems, but the employees and the human resource managers believe use of HRIS systems can improve the working environment of a business.

#### 2.3 Research Technologies & Languages

##### 2.3.1 Currently used technologies

To build this project Ionic and Angular will be used for the front-end development and for the backend I make use of Node.js and for the database I am using the firebase because it is easier to use and is an effective database. In this project I make use of both Fire store and the firebase real time database to provide a quality system. These languages were chosen after researching about each language and determining the advantages, disadvantages, and limits of them. Up to now around 40% of the project has been developed using these languages.

##### 2.3.2 Technologies that will be used in the future

In the coming days I plan to make use machine learning for this project to increase the functionalities of the system and to satisfy the users. So, to add machine learning I will be using Tensorflow.js which is a JavaScript library that will allow me to develop machine learning models in JavaScript and allow me to either use machine learning directly in the browser or in my back end which is the node.js.

### 3. Learning Undertaken

In this project there was large learning curve mainly due to the fact I did not know the languages that was used in the project because I have not used these languages before. In addition, during the research I found out using these languages were the best way to develop the system I planned for. So, to get the knowledge I had to be learn them from the beginning. In the database I did have some experience in using the fire store and NO SQL databases but not the real time database, so I had to learn about that section also. One of the greatest challenges were learning about machine learning and about how to implement them. Multiple machine learning courses were done in linked in learning and Udemy courses to get the basics of machine learning and understand the concepts. Next, I had to learn how to use machine learning in my project and once I came across tensorflow.js through research I started doing an online course on it as well and I am still doing this course and have completed almost 85% of the course. These were the key thing I had to learn for me to do this project to make it a successful project.

### 4.Architectural Diagrams

#### 4.1 Activity Diagram

Diagram, engineering drawing

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Figure 4.3: Activity Diagram

#### 4.2 Use case Diagram

Diagram

Description automatically generated

Figure 4.2: Use Case Diagram

#### 4.3 Context Diagram

Diagram

Description automatically generated

Figure 4.3: Context Diagram

### 5. Project status

#### 5.1 Progress

The development of the project initially began in November of 2020. The development was begun as soon as the research was completed to meet the strict time schedule met by me and within in the month of November almost 35% of the development was completed and was going in track according to the initial project plan mentioned in the project initiation document. But in December due to certain risk that affected the project such as schedule over run only 5% of the development work was able to be completed. Currently some of the functionalities that have been completed from the system includes authentication of users, notices, chat system and the event calendar which will be displayed in the video submitted.

#### 5.2 Testing and Quality

The testing has been completely done for the 40% of the development that has been completed and during this testing multiple bugs and errors were found and resolved. The quality is ensured in the completed part of the project because I was able to get opinions from couple undergraduates who are studding Human resource management, according to their response they find the functionalities useful and easy to use.

#### 5.3 Future Development

The project development being only 40% completed and there is 60% more to be done within the timespan of one and half month according to my updated project plan. Among the functionalities that is yet to be developed machine learning would be the one that word take the most amount of time and will be hard to implement so it will be done last after building the core functionalities of the system. Some of the main functionalities that is yet to be completed are attendance, employee management, and salary management.

#### 5.4 Screen shots of the project

A screenshot of a computer

Description automatically generated with medium confidence

Figure 5.1: Login page

A screenshot of a computer

Description automatically generated with medium confidence

Figure 5.2: Dashboard

A picture containing graphical user interface

Description automatically generated

Figure 5.3: Event calendar

A computer screen capture

Description automatically generated with medium confidence

Figure 5.4: Add events

A screenshot of a computer

Description automatically generated

Figure 5.5: Chat lobby

A picture containing text, screenshot, monitor, indoor

Description automatically generated

Figure 5.6: Chat group for HR Managers

A picture containing text, monitor, screenshot, indoor

Description automatically generated

Figure 5.7: Add Notices

A screenshot of a computer

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Figure 5.8: Documents page

A screenshot of a computer

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Figure 5.9: Add Documents

A screenshot of a computer

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Figure 5.10: Users Page

A computer screen capture

Description automatically generated with medium confidence

Figure 5.11: Add users

### 6. Risks Encountered

During the development of the project two main risk impacted the project but since those risks were identified and a plan was made on the project initiation document, they did not have a huge impact on the project. The risks that impacted and how they affected the project is mentioned below.

The first risk that occurred and impacted the highest was schedule over run. Even though I created the project plan giving time for the other projects and submissions. I did not correctly anticipate the time it would take to complete the other projects due to this I missed certain deadlines I kept for myself within this project and as a result the plan to finish at least 65% of the development before first interim report was not accomplished and could only do 40% of the development and had to create a new project plan that puts the project completion data a little behind than the initial plan.

The second and last risk that occurred was technical issues, even though this could have been a major issue but since I identified it and managed this issue by using version control software like GitHub it did not affect a lot because I uploaded to GitHub at least twice a week once I complete any part of the project due to this, I didn’t lose any part of the project and was able to get back to work once my device was fixed.

### 7. Changes to the project

#### 7.1 Brief

There are no huge changes to the project. The only change that will be done to the project will be a new project plan because the initial project plan was not feasible due to the risk encountered along the way, so a new project plan is made and with it the project will be able to be completed on time without any complications. The rest of the things mentioned in the project initiation document stays the same including the project scope.

#### 7.2 Finalized Project plan

|  |  |  |
| --- | --- | --- |
| **Project Plan** | | |
| **Stage** | **End date** | **Products/deliverables / outcome** |
| Project Initiation | 03/11/2020 | Project initiation document |
| Research on the development area | 05/11/2020 | A clear understanding of what human resource managers need and the short comings of the current HRIS systems |
| High Level designs of the system | 10/11/2020 | Design documents that are needed for the project and graphical user interface layouts |
| Increment 1 | 10/02/2021 | Development of the functionalities for human resource managers in the web and mobile application |
| Increment 2 | 31/02/2021 | Development of the functionalities for employees in the web and mobile application |
| Increment 3 | 15/03/2021 | Integration of machine learning and some of the other functionalities |
| System testing | 23/03/2021 | Testing the entire system |

### 8. Conclusion

The current stage of the project is that the research is completely done and have a clear idea of Human resource managers, their responsibilities, and their tasks. In addition, I have a clear understanding of the functionalities that will be provided in this project. I also know and have a clear understanding of the languages and the technologies that I will be using this project and because of this I can now focus fully on the development of this project.

The development status of the project is that only 40% is complete and I have another 60% of the development to work on but do note that the 40% of this development was implemented while I was learning the languages and phasing the risks mentioned above. And now since I have completed the learning process and have a clear understanding of the languages and the technologies that will be used it will be easier for me to implement functions to the project and I will be able to meet the updated project plan and provide a quality functioning human resource information system that will satisfy the Human resource managers and employees needs and wants.

### 9. Appendix

#### 9.1 GitHub Commits

Graphical user interface, application

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Figure 9.10: The dates on which commits were made to GitHub

## 15.5 Questioner

Chart, pie chart

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Figure 15.1: Questioner Results

Chart, pie chart

Description automatically generated

Figure 15.2: Questioner Results

Chart, pie chart

Description automatically generated

Figure 15.3: Questioner Results

Graphical user interface, table

Description automatically generated with medium confidence

Figure 15.4: Questioner Results

Chart, pie chart

Description automatically generated

Figure 15.5: Questioner Results

Chart, pie chart

Description automatically generated

Figure 15.6: Questioner Results

Graphical user interface, text, application, email

Description automatically generated

Figure 15.7: Questioner Results

Chart, pie chart

Description automatically generated

Figure 15.8: Questioner Results

Chart, pie chart

Description automatically generated

Figure 15.9: Questioner Results

## 15.6 GitHub Commits

Graphical user interface, application

Description automatically generated

Figure 15.10: The dates on which commits were made to GitHub

## 15.7 LinkedIn Courses Completed

Text

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Figure 15.11: Courses completed

Text

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Figure 15.12: Courses completed

## 15.8 Supervisor Meetings

**Final Year Project – Supervisory meeting minutes**

Meeting No: 01

Date : 16 October 2020

Project Title : HRIS System

Name of the Student : Nidula Nuran Wijesuriya

Students ID : 10674049

Name of the Supervisor : Dr. Rasika Ranaweera

**Items discussed:**

In this meeting I suggested the Human resource information system and the functionalities it will have along with what technologies I am planning to use. In addition, I was advised on some of the things I was going to implement and provided me with suggestions on the HRIS system. We also discussed the things that should be there in the project proposal.

**Items to be completed before the next supervisory meeting:**

I was asked to complete the project proposal and submit it to the DLE and start on the project initiation document

……………………….

Supervisor (Signature & Date)

**Final Year Project – Supervisory meeting minutes**

Meeting No: 02

Date : 23 October 2020

Project Title : HRIS System

Name of the Student : Nidula Nuran Wijesuriya

Students ID : 10674049

Name of the Supervisor : Dr. Rasika Ranaweera

**Items discussed:**

During this meeting we discussed about the project initiation document and the things it should contain and discussed on the things that I could add to improve it such as the questioner. We also discussed my decision of changing from desktop to a web and mobile application

**Items to be completed before the next supervisory meeting:**

I was advised to complete the project initiation document

……………………….

Supervisor (Signature & Date)

**Final Year Project – Supervisory meeting minutes**

Meeting No: 03

Date : 06 November 2020

Project Title : HRIS System

Name of the Student : Nidula Nuran Wijesuriya

Students ID : 10674049

Name of the Supervisor : Dr. Rasika Ranaweera

**Items discussed:**

During this meeting we discussed the current progress of the project and what is the future plan is and also discussed about the graphical user interface designs of the application

**Items to be completed before the next supervisory meeting:**

To complete the graphical user interface designs so that we can discuss about it and so I can start on the first increment of the incremental approach of the project.

……………………….

Supervisor (Signature & Date)

**Final Year Project – Supervisory meeting minutes**

Meeting No: 04

Date : 20 November 2020

Project Title : HRIS System

Name of the Student : Nidula Nuran Wijesuriya

Students ID : 10674049

Name of the Supervisor : Dr. Rasika Ranaweera

**Items discussed:**

During this meeting we discussed the current progress of the project and discussed what I should do in the future in addition we also discussed whether I am following the project plan and discussed whether I am meeting the project plan timeline.

**Items to be completed before the next supervisory meeting:**

To start development in the project and continue the work.

……………………….

Supervisor (Signature & Date)

**Final Year Project – Supervisory meeting minutes**

Meeting No: 05

Date : 12 February 2021

Project Title : HRIS System

Name of the Student : Nidula Nuran Wijesuriya

Students ID : 10674049

Name of the Supervisor : Dr. Rasika Ranaweera

**Items discussed:**

During this meeting we discussed the current progress of the project. I showed my progress in the software and then got the advice from the supervisor on the status of the project and the things in need to improve in the software.

**Items to be completed before the next supervisory meeting:**

I was advised to add more functionality to the current software and continue the development process.

……………………….

Supervisor (Signature & Date)