DECLARATION

We hereby declare that we carried out the work reported in this report in the Department of

Information Communication technology at IPRC Tumba, under the supervision of MPORANZI

Joel. We solemnly declare that to the best of our knowledge, no part of this report has been

submitted here or elsewhere in a previous application for award of an academic qualification. All

sources of knowledge used have been duly acknowledged.

Date:...../2022

Date:...../2022

.....

BYAMUNGU Lewis

NIYONASENZE Aliane

Reg: 19RP00680

Reg: 19RP05407

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APPROVAL

This is to certify that the project titled "Ferwafa Match Day Reporting Mobile Application" carried out by BYAMUNGU Lewis and NIYONASENZE Aliane has been read, checked and approved for meeting part of the requirements and regulations governing the award of the Advanced Diploma of Information Technology of IPRC Tumba, Rwanda.

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DEDICATION

We dedicate our dissertation work to the king of the kings, our almighty God, for his protection.

We also dedicate this project to:

Our beloved parents

Our lovely brothers and sisters

Our teachers

Our trusted mentors

Our highly rated classmates for their support during our academic programs

Our country

And also to all Rwandan citizens in general

ACKNOWLEDGEMENT

As my academics and internship experience are success, We express my deepest appreciation to all those who provided me the opportunity and guidance.

First and foremost, we heartedly thank the almighty God for the gift of life and spirit of hard work that he has always stowed in us especially during this project. Afterward, we would like to acknowledge the contributions of the following group and individuals to the development of this project:

The class peer for the cooperation and fellowship, IT community, Lecturers, classmates but especially **Government of Rwanda** and **IPRC-Tumba** for their financial contribution for carrying out the studies.

We are also thankful to the supervisor of this project **Mr.** MPORANZI Joel, whose encouragement, guidance and support from the initial to the final level enabled us to develop an understanding of the subject and for providing necessary facilities to carry out this project work.

ABSTRACT

Football is the world's most popular ball game in numbers of participants and spectators, game in which two teams of 11 players plays to maneuver the ball into the opposing team's goal. in middle there is Referee who is the final decision-making and authority to start and stop play and impose disciplinary action against players and coaches during a match as Football continued to influence its lovers, so it has become essintial to manage the way referee make reporting about game. (Joy, 2003)

Recently in Rwanda association football once match end referee report through papers match (goals and players disciplinary action) obtained during match to arbitration commit then they make decision. Due to that report is in papers They Open Each Document To know player who got red card to be punished to miss 2 next match and count player's yellow cards obtained in previous match so that collection of data is Complicated and time consuming, and As Human being Often make Mistakes Referees may be mistaken for reports that lead to a team being Penalized Unfairly

In order to manage reporting in the FA, it is required to develop this system, which will give referees a means to submit reports through our system. Automatically calculates and reports the total number of cards (yellow and red) given to each player. It also assists the teams, the competition's organizer, and player disciplinary monitoring in identifying players who have received disciplinary sanctions in a prior match and should be suspended from the upcoming match so that the teams can prepare for it more effectively.

Design and implementation of Ferwafa Match Day Reporting Mobile Application is achieved from the knowledge gained from our classes facilitators, colleagues, different books and internet. With all those resources we develop innovative system for managing and controlling games event those have achieved by using WEB application, MOBILE application and E-mail API. This system will make contribution between FERWAFA and its stakeholder by operating in digital system from manual system.

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LIST OF ABBREVIATION

API: Application Programming Interface

CAF: Confederation Africaine de Football

CSS: Cascading Style Sheets

FA: Football Association

FERWAFA: Rwandese Federation of Association Football

FIFA: Federation Internationale de Football Associations

FMDRMA: Ferwafa Match Day Reporting Mobile Application

HTML: HyperText Markup Language

PHP: Hypertext Preprocessor

CHAPTER ONE: INTRODUCTION

1.0 INTRODUCTION

Ferwafa Match Day Reporting Mobile Application is management project which will help Ferwafa in Managing, monitoring and analyzing Report highlighted cards consist Scores, Red, Yellow Cards obtained during the match and disciplinary sanctions subjected to the player, the System also can count and provide the numbers of cards (yellow, Red) assigned on player and will also help the teams, Organizer of Competition and Player disciplinary Monitoring to know a player who is subject disciplinary sanctions on previsious match in order to be suspended for the next following matches due to the gravity of fault.

1.1. BACKGROUND

The Federation Rwandaise of Football Association – Ferwafa – a non -governmental and non-profit organization has the national mandate to develop and organize football competitions throughout out Rwanda.

It is the sole institution governing the football in Rwanda and recognized as such by the Government of Rwanda on one hand and by both FIFA (Federation Internationale de Football Associations) and CAF (Confederation Africaine de Football) as their member on the other hand.

Rwandese Federation of Association Football (FERWAFA) was founded in 1972 and became a FIFA and FIFA affiliate in 1978.

From the above setting, Ferwafa operates within the framework of the FIFA/CAF regulations; holding itself to respect them and its members to comply with its own statute and the directives/decisions from FIFA/CAF.

1.2 PROBLEM STATEMENT

Match Reporting in Rwanda Primus National League includes some different challenges or problems originated on how it is still difficult to collecting data where they use papers Which is very complicated to analyze it, Ensuring The Player who will not play the Next Game for the disciplinary sanctions taken to him. In additional, it's hard to remember all your players when they have punished by Cards (Red, Yellow) and sometimes Referees make Mistake on reports that leads the team be Penalized Unfairly.

It is not only that but also in Rwanda Primus National League incorporate some misunderstandings originated on misleading from referees and the team managers in forgerzing or falsifying the report after match. The problems avail when each of them referee tries to rise their own interest by accepting corruption due to there is no safe ways of keeping the true collected data after match that can be used or be considered.

Thus this is important or helpful to the organizer of the competition when they are making follow up how the competition has gone and also in preparation of it.

The manual process of collecting the data it requires a long process to analyzing the data after game that jeopardize earlier preparation to the teams for the next games thus the team manager should get an access or receive those data direct because it's an important to them.

1.3 OBJECTIVE OF THE STUDY

1.3.1 GENERAL OBJECTIVE

The general objective of this project is to providing a great contribution in Rwanda Football by Preventing Problems of Reporting, where there is a misleading or falsification of the data and unfair process by providing Web and Android App to Automation the Report.

1.3.2 SPECIAL OBJECTIVE

The specific objectives of this project are:

- ✓ Reducing long process report of the manual system
- ✓ Collecting Players cards And Produce Decision For Following Matches
- ✓ To Providing the safe framework of preparing Rwanda Primus National League

1.4 SCOPE OF THE STUDY

Project will help Rwandan 1st Division Football League (Primus National League) by managing and monitoring the competition and its arbitration throughout in good ways. And will help the shareholders (teams) to be informed or to know data which is real and safe on time through in our system.

1.5. INTERESTS OF THE PROJECT

1.5.1 Personal

The present work gives the opportunities to improve practical knowledge in the field of software development especially in application design and to be able to compete in the software development market. .

1.5.2 Public

- ✓ System provide way the teams be informed on time ,Results of game And punishment given to it's members through this System
- ✓ This system provide easy way of managing competitions in department of disciplinary action against players and coaches.
- ✓ It help Football fans and stakeholder to get real Information at time.

CHAPTER TWO: LITERATURE REVIEW

2.1 INTRODUCTION

We have watched rapid developments of football sport in the last couple of years as universal sport, where the most population all over the world became the familiar or got a notion of it by playing otherwise those who have not an ability of playing football becoming a fans of it. Football continued to influence its lovers, where some people started to create their own teams for luxury other tries to making as commercial activities for searching an interest through to some competitions prepared by some federations. Football play a great role of bring together of people and solidarity, improving your strength to those who playing as well in whole range of movement and technical skills not only that but also teamwork, to those act as a career changes their lives.

2.2 REVIEW OF SIMILAR PROJECT

Rwandese Federation of Association Football (FERWAFA) is the sole institution governing the football in Rwanda and is in charge of preparing the different competitions performed here in Rwanda. Actually this federation has the different department in charge of competitions and arbitrations for better to serve their stakeholders.

FA Referee who have ruled the game write on paper the report highlighted with the consistence Scores, Red, Yellow Cards provided during the game and that report must be submitted at department in charge of competition in 24 hours through an E-mail in order to decide the players or other persons who are subjected by disciplinary sanctions.

The stakeholder or teams are required to visit the website of Rwandese Federation of Association Football (FERWAFA) to search the results or the decisions provided by department of competitions for better preparations of the following or next games for instance to know the players who have been subjected by disciplinary sanctions at that time teams make much attention not use them.

With using our system of Ferwafa Match Day Reporting Mobile Application will correct all of these long process of how the stakeholder or teams obtain the information by getting an access on that informations automatically without delaying

2.2.1 FERWAFA MATCH DAY REPORTING MOBILE APPLICATION TOOLS

2.2.1.1 Season Fixtures

Fixtures is terming used in Football which is like A scheduled match show how Team will be facing with in Give time

2.2.1.2 Team Squad Lineup

In sports, a **starting lineup** is an official list of the set of players who will participate in the event when the game begins The players in the starting lineup are commonly referred to as starters, whereas the others are substitutes or bench players.

2.2.1.3 API

An **application programming interface** (**API**) is a way for two or more computer programs to communicate with each other. It is a type of software interface, offering a service to other pieces of software. (article, 2008)

2.2.1.4 Host

A host is any hardware device that has the capability of permitting access to a network via a user interface, specialized software, network address, protocol stack, or any other means.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1INTRODUCTION

Research methodology is the specific procedures or techniques used to identify, select, process, and analyze information about a topic. In a research paper, the methodology section allows the reader to critically evaluate a study's overall validity and reliability. The methodology section answers two main questions: How was the data collected or generated? How was it analyzed?

3.1.1 Methodology and Techniques of Research Used

The tools used to collect that for this project are observation of existing systems, face-to-face

3.2 Data collection

The tools used to collect that for this project are observation of existing systems, face-to-face interviews and internet documents.

3.2.1 Face to Face Interview

The face-to-face interview, also called an in-person interview, it has continued to be the best form of data collection when one wants to minimize non-response and maximize the quality of the data collected. By using this methodology we interviewed the Assistant Spokesperson of Rwanda Football Federation "Jules KARANGWA" he have asked on the process of how report—from the match provided after match ended? He replied that the referee who have ruled the game write on paper the report highlighted with the consistence Scores, Red, Yellow Cards provided during the game and that report must be submitted at department in charge of competition in 24 hours—through—an E-mail in order to decide the players or other persons who are subjected by disciplinary sanctions. After the stakeholder or teams are required to visit the website of FERWAFA to search the results or the decisions provided the department of competitions.

Face to face interviews outcomes

The outcomes of this interview were very interesting due to we got an imagination of bringing or making innovation by creating system of FERWAFA daily match report will correct all of these long process.

Within the discussions done with him, I found that there are many challenges of using existing system which led to the stakeholders or teams have been informed delay this resulted them to commit faults.

3.2.2 Internet

The internet will help me to search other related tasks done and what other people wide world are thinking about managing social media account using single platform.

3.3 Information gathering techniques

Information gathering is defined as the process of understanding how the current system works, its working principles, the characteristics and the limitations in order to come up with the new system that provides effective service, the researcher used the following techniques to gather the required information, Observation and Documentation techniques as follows.

3.3.1 Documentation

Documentation is one of data collection from written sources used in this project. Those sources are journals, internet, library and publications.

During this research, in order to compare and make a rational analysis and come up with relevant conclusions, the researcher uses books, others' related researches and reports, as well as internet sources.

CHAPTER FOUR: SYSTEM ANALYSIS AND DESIGN

4.1 INTRODUCTION

System analysis and design deal with planning the development of information systems through understanding and specifying in detail what a system should do and how the components of the system should be implemented and work together. System analysts solve business problems through analysing the requirements of information systems and designing such systems by applying analysis and design techniques. This course deals with the concepts, skills, methodologies, techniques, tools, and perspectives essential for systems analysts. (Group, 2000)

4.2 Description of the new system

As we mentioned and explained about the existing system in Background, this system allows Rwanda Football Association To Manager Match of the day reports by By calculating player cards obtained in Previous Matches and notifying players who will miss matches owing to cards received in prior matches

4.3 Software development model used

After making research and gathering the necessary information about project the next concern is how to arrange these processes to develop and implement the system. They are many models to arrange activities like waterfall, iterative/incremental that include spiral and rational unified process, agile process. For our system we chose to use an agile process.

4.3.1 Agile process

The Agile methodology is a way to manage a project by breaking it up into several phases. It involves constant collaboration with stakeholders and continuous improvement at every stage. Once the work begins, teams cycle through a process of planning, executing, and evaluating. Continuous collaboration is vital, both with team members and project stakeholders. (Www.wrike.com, 2006)

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4.4 Illustration of new system

4.4.1 Data Flow Diagram

A DFD is a graphical representation of the flow of data through an information system. Data flow diagram gives an overview of our system inputs, processes, and outputs when using this system. Data flow diagram focuses on the flow of data, the process to manipulate the data, and the storage for the data in the system.

There are only four elements in DFD, data flow, process, data store and external entity. Dataflow approach emphasizes logic underlying the system.

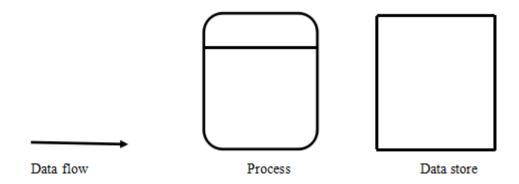


Figure 1: Data Flow diagram

DFD Element	Typical representation in real system				
Data flow	 Flow of data / Network connection Screen / Form (in the case of data flow to/from external entity) 				
Processes	 Sub-system / Program module / Equipment Human process 				
Data store	 Database / Data storage (hard disk, backup tape, etc.) Storage of things 				

Table 1: DFD Elements

DFD representation of Ferwafa Match Day Reporting Mobile Application

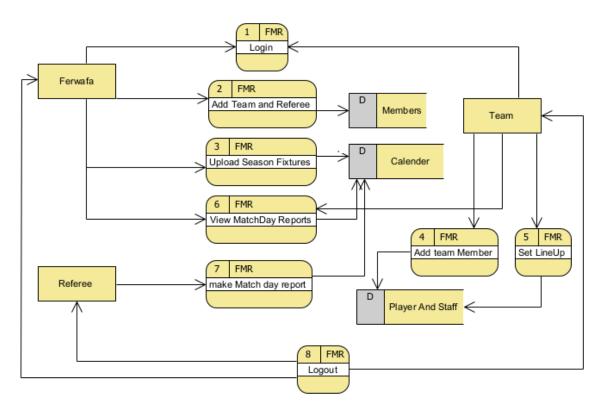


Figure 2: DFD representation of FMDRMA

4.4.2 Use Case

Use case diagram we have used it to captures global functional requirements of a booster system. It provides an implementation-independent view of what a system is supposed to do and allows the modeler to focus on user needs rather than realization details

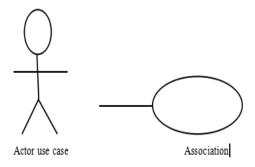


Figure 3: Use Case

Use case element	Typical representations in real system
Actor	 User / Operator / People involved in the system Any external entity for the system Agent-like process inside the system
Use case	Activity / Action / Process
Associatio n	 Involvement of an actor to a use case such as usage, communication, command, etc. Action or verb between actor and use case, or among use cases Usually, association will be drawn without any description. If necessary, however, you can describe the association by words or sentences. Note: You should NOT use arrow, but should use simple line

Table 2: Use case Element

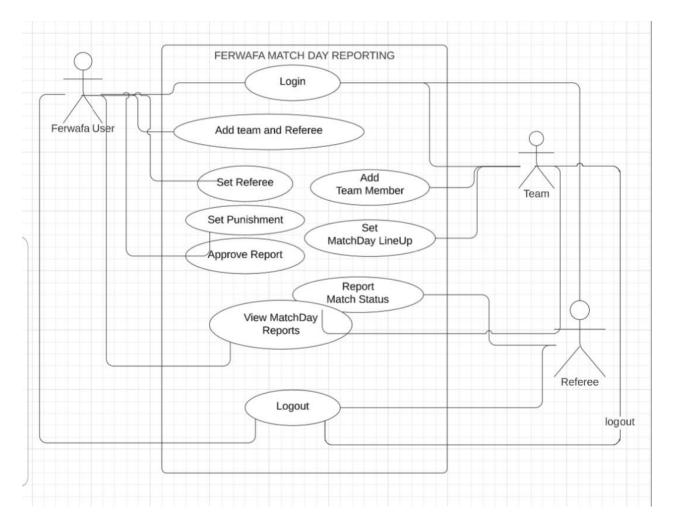


Figure 4 : User Case Diagram

4.4.3 Entity Relationship Diagram

Entity Relationship Diagram (ERD) is a data model for high-level descriptions of conceptual data models. It is typically used in system design process in order to analyze and design the data structure inside the system, and it describes information needs and/or the type of information that is to be stored in the database. ERD is normally used in System Design phase of data oriented approach, but is also sometimes used in requirements definition phase if the system is almost a pure database system with rather clear requirements of data structure for the database from the beginning.

ERD Element	Typical representations in real system
Attribute	 A static noun (not an encapsulated object with actions) A meaningful set of information Relation Document, form, table
Entity	 A verb (interaction or relation between entities) Relations, actions, procedures, events
Relationship	 Attribute that belongs to an entity or to a relationship Data element, field, parameter

Table 3: ERD Components



Figure 5: ERD Of FMDRMA

4.4.4 Data Dictionary

Data dictionary is a collection of descriptions of data objects or items in a data model for the benefit of programmers and others who need to refer to them. A first step in analyzing a system of objects with which users interact is to identify each object and its relationship to other objects. This process is called data modeling and results in a picture of object relationships. After each data object or item is given a descriptive name, relationship is described (or it becomes part of some structure that implicitly describes relationship), the type of data (such as text or image or binary value) is described, possible predefined values are listed, and a brief textual description is provided. This collection can be organized for reference into a book called a data dictionary



Figure 6 : Team User Table

1 referee_id 🔑	int(11)	No None	AUTO_INCREMENT
2 fname	varchar(40) utf8mb4_general_ci	No None	
3 Iname	varchar(40) utf8mb4_general_ci	No None	
4 image	varchar(30) utf8mb4_general_ci	No None	
5 email 🔎	varchar(40) utf8mb4_general_ci	No None	

Figure 7 : Referee table

1 member_id 🔑	int(11)		No	None	AUTO_INCREMENT
2 fname	varchar(30)	utf8mb4_general_ci	No	None	
3 Iname	varchar(30)	utf8mb4 general ci	No	None	
4 number	, ,		No	None	
	varchar(3)	utf8mb4_general_ci			
5 role_in_team	varchar(10)	utf8mb4_general_ci	No	None	
6 post	varchar(20)	utf8mb4_general_ci	No	None	
7 position	varchar(30)	utf8mb4_general_ci	No	None	
8 team	int(11)		No	None	

Figure 8 : Team Member Table



Figure 9 : Users table

)	1	report_id 🔑	int(11)		No	None	AUTO_INCREMENT
)	2	team_member	int(11)		No	None	
)	3	team	int(11)		No	None	
)	4	goal	varchar(2)	utf8mb4_general_ci	No	None	
)	5	goal_min	varchar(3)	utf8mb4_general_ci	No	None	
)	6	card	varchar(10)	utf8mb4_general_ci	No	None	
)	7	card_min	varchar(3)	utf8mb4_general_ci	No	None	
)	8	week	int(11)		No	None	

Figure 10 : Match Reporting Table

1	id 🔑	int(11)		No	None	AUTO_INCREMENT
2	home	varchar(30)	utf8mb4_general_ci	No	None	
3	away	varchar(30)	utf8mb4_general_ci	No	None	
4	week	int(11)		No	None	
5	stadium	varchar(40)	utf8mb4_general_ci	No	None	
6	date	varchar(30)	utf8mb4_general_ci	No	None	
7	time	varchar(10)	utf8mb4_general_ci	No	None	
8	season	varchar(30)	utf8mb4_general_ci	No	None	
9	status	varchar(20)	utf8mb4_general_ci	No	future	

Figure 11 : Season Calendar table

CHAPTER FIVE: SYSTEM IMPLIMANTATION

5.1 Introduction

The Ferwafa Match Day Reporting Mobile Application is developed and deployed using Java

and PHP in both web and mobile applications.

accomplishing user tasks. We were use HTML and CSS, Bootstrap and Java Language , MySql

database where it stores all information and run on Apache server.

5.2 Implementation tools and technology

We used a variety of tools and technologies to implement our project Ferwafa Match day

reporting Mobile Application, including the following:

Java

Java is a popular programming language, created in 1995. It is owned by Oracle, and more

than 3 billion devices run Java.

It is used for:

Mobile applications (specially Android apps)

• Desktop applications

• Web applications

• Web servers and application servers

Games

Database connection

• And much, much more!

MySQL

MySQL is a very capable relational client/server database system. It is sufficiently secure and

stable for many applications, and it offers an excellent cost/benefit ratio (not only because

MySQL is free itself, but also makes comparatively modest demands on hardware).

18

Bootstrap

Bootstrap is the most popular CSS Framework and powerful toolkit a collection of HTML, CSS, and JavaScript tools for creating and building webpages and web applications. Why web designers and web developers like bootstrap because it is flexible and easy to work with. Its main advantages are that it is responsive by design, it maintains wide browser compatibility, and it offers consistent design by using reusable component.

HTML

HTML stand for "Hypertext Markup language" is a markup language used to create the web pages you visit every day. It provides a logical way to structure content for web pages.

CSS

CSS stand for "Cascading Style Sheet." CSS are used to format the layout of web pages. They can be used to define text styles, table sizes, and other aspects of web pages that previously could only be defined in a page's HTML. CSS gives web developers more exact control over how web pages will look like than HTML does. This is why most web pages to day incorporate CSS as we used it also.

Visual studio code

VS Code is a source code editor developed by Microsoft for windows, Linux and MacOS and It comes with built-in support for JavaScript, TypeScript and Node.js

5.1.3. Screenshots of Ferwafa Match Day Reporting Mobile Application

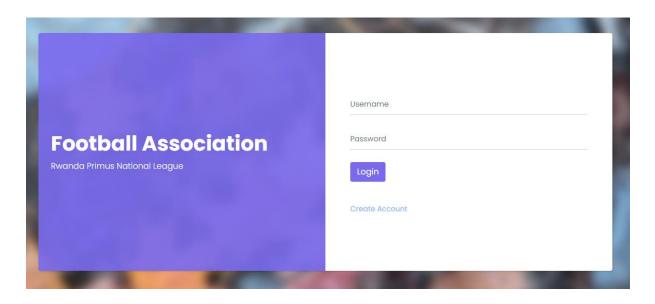


Figure 12: Login Form

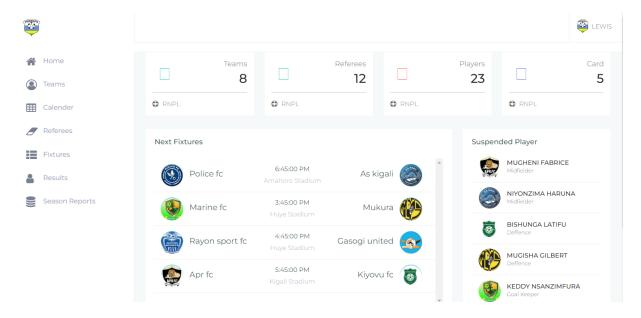


Figure 13 : Ferwafa home Page

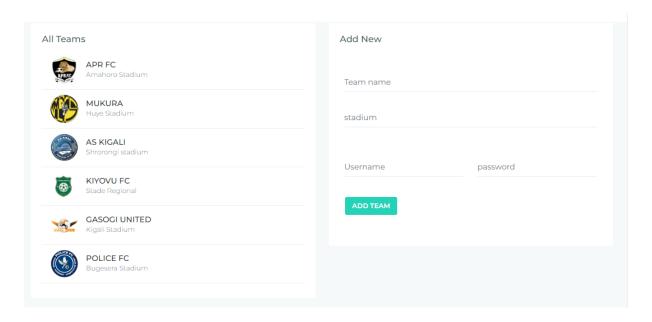


Figure 14: Add Team

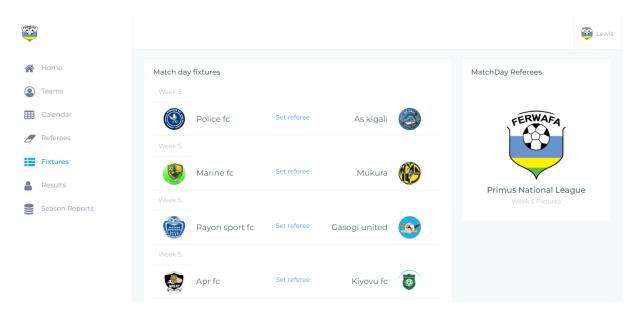


Figure 15: Allocating Referees

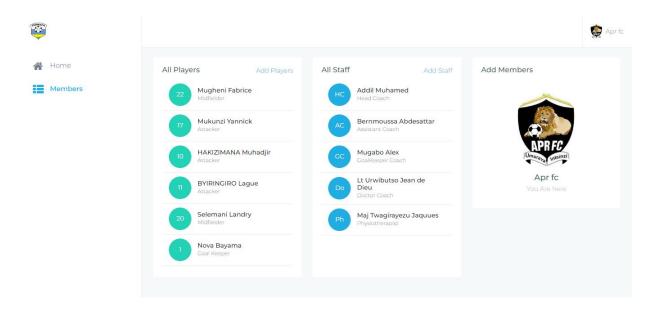


Figure 16: Team_Member registration Pages

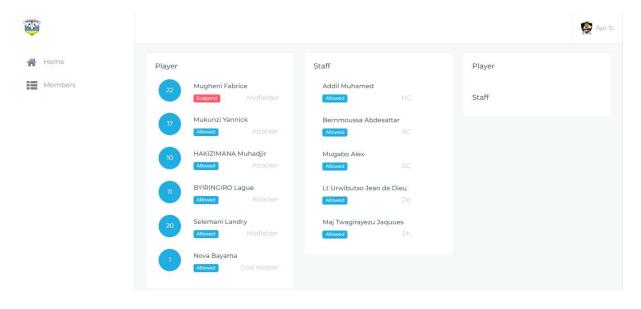


Figure 17: Upload Squad Page

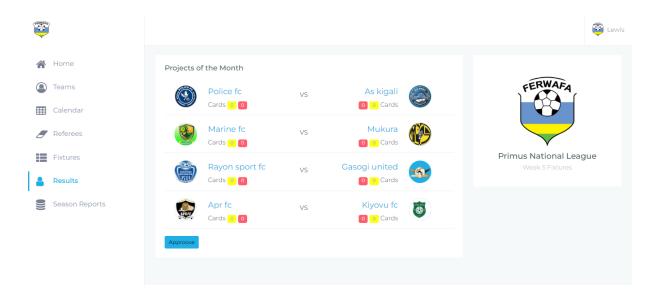


Figure 18: Report Pages

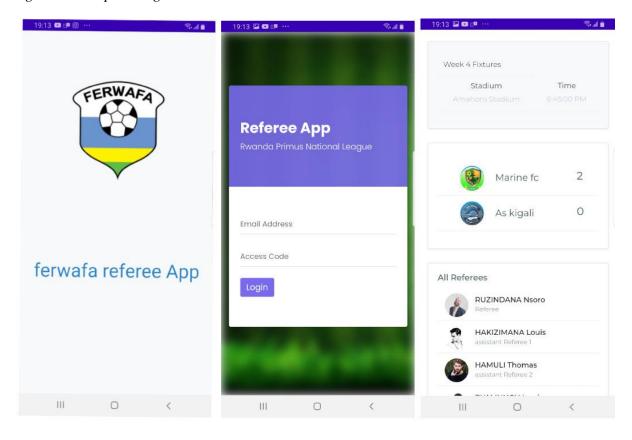


Figure 19: referee User mobile Application

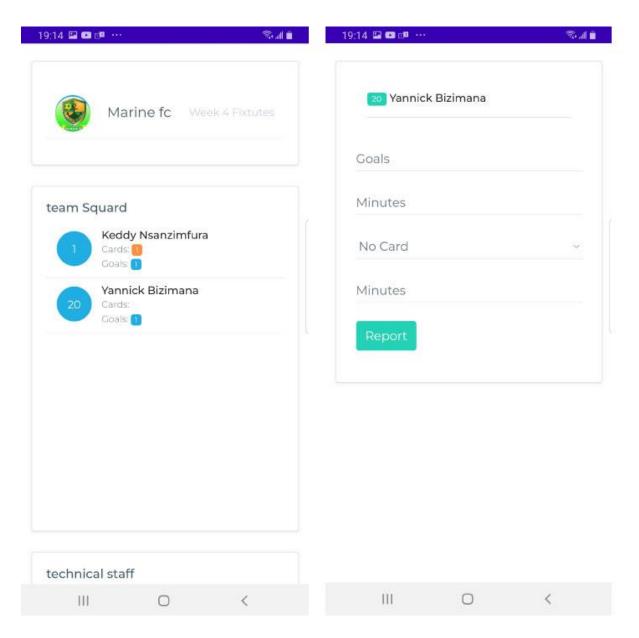


Figure 20 : Mobile Application Referee reporting

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

This chapter is based upon the conclusion of what was done so far and how the system can be further enhanced with an increase in requirements.

5.1 Conclusion

The Main Objective of This Project was To Improve the Manual FA Reporting System with a Focus on How It Manage Player Discipline Monitoring to identify players who have received disciplinary actions during a recent game in order to suspend them for the Next Game.

The goal has been successfully attained with the best practices for designing and building a web platform and mobile application, which will assist the Rwanda Football Association in moving from a manual system that is difficult and time-consuming and way that is not safe for keeping of data as it kipped on papers to working in Digital Technology.

5.2. Recommendations

During this work project, We have met different challenges like little time of implementing this system and that's the reason why We recommend to our school authorities,

To expand this system's features by including team rankings and player statistics.

We encourage my former computer scientist's young siblings and sisters to include additional games like volleyball, basket ball and so on in this system because it offers a better method of players disciplinary Management.

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APPENDIX

```
<?php
require 'init.php';
include "mail.php";
if (isset($_POST['submit'])) {
  $Referee = $_POST['select1'];
  Ass1 = POST['select2'];
  Ass2 = POST['select3'];
  $Official = $_POST['select4'];
  $match_id = $_POST['match_id'];
    $sql1 = 'SELECT * FROM calender WHERE id=?';
    $stmt = $connection->prepare($sql1);
    $stmt->execute([$match_id]);
    while($data=$stmt->fetch(PDO::FETCH_ASSOC)){
    $home = $data['home'];
    $away = $data['away'];
    $stadium = $data['stadium'];
    $date = $data['date']:
    $time = $data['time'];
    $week = $data['week'];
    $sql1 = 'SELECT * FROM referee WHERE referee_id=?';
    $stmt = $connection->prepare($sql1);
    $stmt->execute([$Official]);
    while($data=$stmt->fetch(PDO::FETCH_ASSOC))
    $email = $data['email'];
    access\_Code = (rand(10,1000000));
 try {
  $sql = 'INSERT INTO weekly_fixtures(match_id, referee, assistant1, assistant2,
official,access_code) VALUES (?,?,?,?,?)';
  $stmt = $connection->prepare($sql);
  if($stmt->execute([$match_id,$Referee,$Ass1,$Ass2,$Official,$access_Code]))
  send_mail($recipient,$subject,$message);
   $recipient = $email;
   $subject = "Rwanda Primus national League";
   $message ="";
   $message .= '<h3>Match Day '.$week.' Fixture</h3>';
   $message .= '<h4>'.$home. '<small> VS </small>'.$away.'</h4>';
   $message .= '<strong>Stadium: </strong>'.$stadium.'<br>';
```

```
$message := '<strong>Date: </strong>'.$date.'<br>';
$message := '<strong>Time: </strong>'.$time.' <br>';
$message := 'Match Access Code: <strong>'.$access_Code.'</strong>';
if(send_mail($recipient,$subject,$message))
{
    header("Location: ../fixture.php?set=$match_id");
    }
else {
    header("Location: ../fixture.php?Email_error");
    }
}
catch (PDOException $e) {
    //echo $e->getMessage();
header("Location: ../fixture.php?error");
}
}
}
```