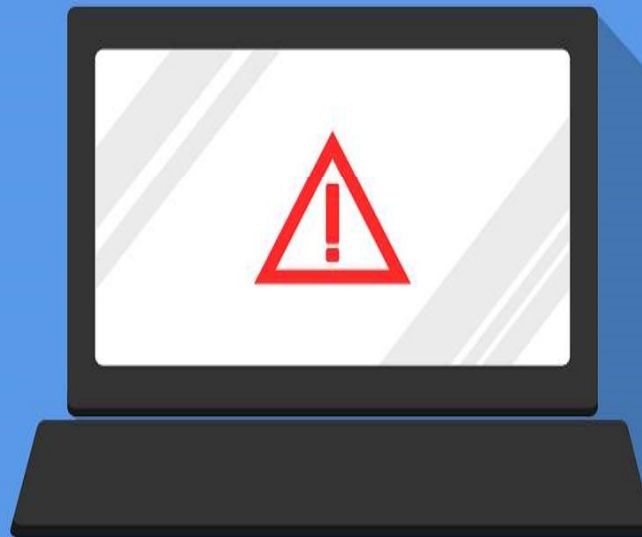




King Abdulaziz University  
Department of Computer Science  
Faculty of Computing and Information Technology  
CPCS-351 | 2nd Term 2020



# I AM AWARE



Version: 0.7

Status: **Draft**



# I AM AWARE

Date	Version	Description	Authors
10 Feb 2020	0.1	Introduction and SRS of the cybersecurity awareness mobile game, I AM AWARE.	All team members
12 Feb 2020	0.2	Finalized and added project goals and scope.	
15 Feb 2020	0.3	Done all other sections in the first phase.	
25 Feb 2020	0.4	Fixed all the remarks forwarded by the professor.	
7 March 2020	0.5	Complete the UML class and Object diagrams.	
26 March 2020	0.6	Complete the modeling diagrams and testing section.	
14 April 2020	0.7	Edit the project as the feedback required.	

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# **PHASE 1: PROJECT DESCRIPTION & BUSINESS REQUIREMENTS SPECIFICATIONS**









## **1.1 Introduction**

Since the dawn of time, humans were always tools builders. They build tools to improve their quality of life and make it as efficient and easy as possible. As we hit the information technology revolution; today, we find ourselves faced with many prominent issues such as cybersecurity and data privacy. The original vision of the early fathers of the internet was, “a group of mutually trusting users attached to a transparent network”.

We believe that the average user of the internet is clueless about the domain of cybersecurity. Unfortunately, we can observe that he/she does not know how to use the internet safely. For example, many people choose their phone number as a password which is highly public information.

Therefore, we aim through the development of a mobile serious game application to increase the average user of the internet awareness of cybersecurity. That is split into five key concepts in cybersecurity: What makes a strong password? How can an email be trusted? Is it safe to browse any website? How to use social media credibly? And, is any network safe to use? Finally, we aim to inform the user of the magnitude of risk they face by using their everyday technology through relatable and informative insights. We want to take the average user of the internet from saying “I AM CLUELESS”, to say “I AM AWARE”.

## 1.2 Project Objectives

-  Increase the user's awareness of the necessity of a strong password
-  Teach the user the fundamental of what makes a strong password
-  Instill the caution-mentality into the user when dealing with emails online
-  Broaden the user's knowledge of the internet and the proper and safe usage
-  Motivate the user to question the credibility of social media content
-  Transform the user into a positive force that makes the internet a safer space
-  Show the user how their data go about the internet
-  Present the user with insights and statistics of cybersecurity to help them understand the magnitude of the risk they are exposed to when using the internet

### 1.2.1 Project Organization

#### First Phase:

- ✓ Defining the introduction of the project
- ✓ Brief information about the project team
- ✓ Goal and Scope of I AM AWARE mobile game
- ✓ The SRS of the software
- ✓ The sources of data and gathering methodology
- ✓ Use cases of I AM AWARE

## Second Phase:

- ✓ Conversion from Use Cases to Class Diagram
- ✓ UML class diagram
- ✓ Association, Multiplicity, and Generalization
- ✓ Object diagrams

## Third Phase:

- ✓ System modeling
- ✓ Interaction diagram
- ✓ Testing strategy
- ✓ Closing and final touches

## 1.3 Project Team

ID	Name	Email	Responsibility
1742925	Talal Alqurashi	talqurashi0015@stu.kau.edu.sa	1.6, 3.1.2, 3.2
1943222	Younes Alturkey	yalturkey0002@stu.kau.edu.sa	1.1-1.5
1845792	Adel Alharthi	aalharthi0525@stu.kau.edu.sa	1.9, 2.1, 2.3
1740420	Fahad Alzahrani	falzahrani0456@stu.kau.edu.sa	1.10, 2.2
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## 1.4 Project Goal










Simply put, we are following the KISS principle in this project. Our team's goal is applying the good practices of software engineering to successfully develop a mobile game that will take a player who is not fully aware of the five key concepts that being: [Password strength matter, don't open any email, not all websites are safe, Social media is not credible, some networks are not safe, and finally, cybersecurity is a real hurdle that requires more attention and awareness from everyone]. To simply and stupidly execute our goal we have three main goals as below.

- 1) Research the latest findings of cybersecurity and present it to the user in a fun mini-game style that entertains and informs the user.
- 2) Develop the mobile game in such a way that it becomes a platform for cybersecurity professionals to share their latest findings with the ability to present it through a fun mini-game.
- 3) Essentially, develop a serious game that contributes to the world-wide efforts to improve awareness of cybersecurity and make the information technology safe to use for everyone involved.








## 1.5 Project Scope

### 1.5.1 Include

-  Proper and cohesive presentation of information
-  Attractive and friendly User Interface (UI)/User Experience (UX)
-  Special effects (SFX) and interactivity
-  Engaging and entertaining mini-games
-  Appealing graphics and uniform color accents
-  Content admin panel and functionality
-  User progression storing and retrieving
-  Periodical and extensive updating of information
-  Rating option to acquire feedback and performance analysis

### 1.5.2 Exclude

-  The game objective is pure entertainment
-  Commenting and editing content
-  Social media integration
-  Leaderboard functionality
-  Multiplayer capability

## **1.6 Domain Analysis**

### **1.6.1 Introduction**

Our goal is to develop a mobile application that educates people and improves Cybersecurity awareness in our society and reducing the risks or vulnerabilities.

Our group focusing develops a serious game for cybersecurity to provide a quick, effective and collaborative way to create awareness and change in people's attitudes and behaviors.

### **1.6.2 General knowledge about the domain**

Cybersecurity became an important field in all aspects to provide better protection. The game focuses on the common threats that are most Internet users face. The game strategy makes the player answer questions and faces real problems and how to deal with them, which increases the player's experience and understand faster and all this in a safe environment. Our approach offers:

#### **Exploration**

By replaying a situation, participants can reach an agreed constructive solution.

#### **Behavioral change**

By experiencing and reflecting on a situation, people become alert to their behavior and have the chance to replay with different (more desirable) behavior.

#### **Training**

By playing a game in an exceedingly safe environment, participants can safely make mistakes, experiment and learn by doing.

### **1.6.3 Users**

Information and cybersecurity companies, and everyone interested to increase their knowledge about cybersecurity and protecting themselves.

- End-user

### **1.6.4 The environment**

Mobile application, it can accept old versions.

### **1.6.5 Competing software**

There are many applications in this field, which makes us look for the best ways to educate the user by applying methodologies that affect the user positively and quickly, in addition to making sure to diversify the sections and questions to cover the most important aspects that the user brings to know.

## **1.7 Requirements**

How we describe the features and functionalities of the system, from gathering and analyzing the business needs and how we collect the information from them, we focused on some important types like functional, non-functional, performance, quality and security.

## 1.7.1 Functional requirements

### 1.Player

- 1.1 The player enters the app through registration or login in.
- 1.2 The player can get to know about cybersecurity and why he needs to be aware of.
- 1.3 The player can read the daily Tips about the 5 main awareness focus areas.
- 1.4 The player can choose one of the 5 main awareness focus areas.
- 1.5 The player can get to know about each focus area.
- 1.6 The player can see their progress and level and overall achievements.
- 1.7 The player must complete the current level in each area before jumping to the next level.
- 1.8 The player can play the game in sequence steps, watching a video, asked a question and playing mini-game.
- 1.9 If the player fails from the game, he could try to solve it again or return to previous steps.
- 1.10 The player can see a better solution to the problem through an educational video
- 1.11 The player can watch his progress in the game and at any level reached

	<p>1.12 The player can play at the same level again to solve the problem in a better way</p> <p>1.13 The player can ask for any help from the support team.</p> <p>1.14 The player can logout from the game anytime.</p>
2.Support team	<p>2.1 The Support team helps the players in misunderstand of the game.</p> <p>2.2 The support team fixes any technical issues in the system.</p>
3.Administrations	<p>3.1 Administrations can add or delete the sections, levels on each section or change the 3.2 rules of the games at any time.</p>
4.System	<p>4.1 The system can interact with the database to save and retrieve the data.</p>
5.Focus areas	<p>5.1 5 main focus areas and each area have own levels.</p> <p>5.2 Daily Tips about each area.</p>

### 1.7.2 Non-functional requirements

- The game can be played without the internet.
- Friendly user interface
- Both in English and Arabic language.
- The system should able to handle the new sections or levels without issues.

### **1.7.3 Performance**

- We tried as much as possible to reduce the game capacity storage.
- It can be played in old devices.
- It can be played in the old operating system.

### **1.7.4 Quality**

- High service quality.
- Fast support.
- Make sure the player be aware of, based on their results.
- The system never gets down.

### **1.7.5 Security**

- The password level is challenging, It should be more than 10 characters, it should contain 1 upper and 1 lower case and 1 for special character and 1 number at least. Encrypting the user's sensitive data.
- To increase the security of a user account, they should be prompted to enter a verification code sent to them via SMS to their registered phone number and/or E-mail.
- Make logging into an account hardware based, meaning there are trusted devices that the user can use to log in to their account easier.
- All the information be backed up in the database each minute.

## **1.8 Techniques Used For Gathering Data**

- Searching for online credible sources.
- Analyst Similar games like 'Cybersecurity Lab' and 'Game of Threats'.
- Asks the target group directly, like questioning our parents and also our friends who work in companies.
- Ask ourselves and putting us in the problem.

## 1.9 Use Cases

All Actors and their use cases:

### 1.9.1 All Actors:

- Register.
  - Allow new users to create a new account.
- Login.
  - To allow already registered users to enter their account.

#### *Register*

<i>Use Case ID:</i>	A1
<i>Use Case Name:</i>	Register
<i>Actors:</i>	All Actors
<i>Preconditions</i>	<ol style="list-style-type: none"><li>1. A user enters his/her name.</li><li>2. A user enters his/her email or phone number.</li><li>3. A user enters his/her password and confirms the password.</li></ol>
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. A user enters his/her information.</li><li>2. User clicks “Register”</li><li>3. The system will create a new account.</li></ol>
<i>Exception</i>	<ol style="list-style-type: none"><li>1. The name has already been used by another user.</li><li>2. The password is too weak.<ul style="list-style-type: none"><li>-It should be more than 8 <b>digits</b>.</li></ul></li><li>3. Invalid email.</li></ol>

#### *Login*

<i>Use Case ID:</i>	A2
<i>Use Case Name:</i>	Login
<i>Actors:</i>	All Actors
<i>Preconditions</i>	The user must be registered in the system.
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. A user enters his/her login information.</li><li>2. User clicks “login”</li></ol>

## 1.9.2 Admin:

- Register player.
  - Add a new player.
- Remove the player.
  - Remove a player from the system.
- Edit the user's details.
  - Edit player information.
- View player scores.
  - View the scores of the player.

### *Register Player*

<i>Use Case ID:</i>	B1
<i>Use Case Name:</i>	Register player.
<i>Actors:</i>	Administrator
<i>Preconditions</i>	<ol style="list-style-type: none"><li>1. The administrator must be registered in the system.</li><li>2. The player should exist in the system.</li></ol>
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The administrator selects the "Register Player" from the menu.</li><li>2. The administrator enters the player's information in the system.</li><li>3. The administrator clicks "register".</li></ol>



### *Remove player*

<i>Use Case ID:</i>	B2
<i>Use Case Name:</i>	Remove a player from the system.
<i>Actors:</i>	Administrator.
<i>Preconditions</i>	<ol style="list-style-type: none"><li>1. The administrator must be registered in the system.</li><li>2. The player should exist in the system.</li></ol>
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The administrator selects “remove player” from the menu.</li><li>2. The system asks the administrator to enter the player’s ID.</li><li>3. The system displays the player’s account.</li><li>4. The administrator clicks “remove”.</li><li>5. The system displays a message asking for confirmation.</li><li>6. The administrator clicks “yes”.</li></ol>

### *Edit user’s details*

<i>Use Case ID:</i>	B3
<i>Use Case Name:</i>	Edit user’s details
<i>Actors:</i>	Administrator.
<i>Preconditions</i>	<ol style="list-style-type: none"><li>1. The administrator must be registered in the system.</li><li>2. The player should exist in the system.</li></ol>
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The administrator selects “edit user details”.</li><li>2. The system asks the administrator to enter the user ID.</li><li>3. The system displays user information.</li><li>4. The administrator performs the editing.</li><li>5. The administrator clicks “OK”.</li></ol>

### *View player Scores*

<i>Use Case ID:</i>	B4
<i>Use Case Name:</i>	View player scores.
<i>Actors:</i>	Administrator.
<i>Preconditions</i>	<ol style="list-style-type: none"><li>1. The administrator must be registered in the system.</li><li>2. The player should exist in the system.</li></ol>
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. Administrator selects “View Player Scores”</li><li>2. The system displays player scores.</li></ol>

### **1.9.3 Player:**

- Play.
  1. New Game.
  2. Resume Game.
  3. Exit Game
- Options.
  1. Show Control.
  2. Change Configuration (Graphics).
  3. Change Sound/Music Volume.
- Report.
  - Write about the problem.
- Score Board.
  1. View Scores.
  2. Reset Score Board.
- Rate the System.
  - Allow users to give feedback.
- Quit.

## Play

<i>Use Case ID:</i>	C1
<i>Use Case Name:</i>	Play.
<i>Actors:</i>	Player.
<i>Preconditions</i>	The player must be logged into the system.
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The player selects “Play”.</li><li>2. Then the player can choose from three options:<ul style="list-style-type: none"><li>• New Game.</li><li>• Resume Game.</li><li>• Exit Game.</li></ul></li></ol>

## Options

<i>Use Case ID:</i>	C2
<i>Use Case Name:</i>	Options.
<i>Actors:</i>	Player.
<i>Preconditions</i>	The player must be logged into the system.
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The player selects “Options”.</li><li>2. Then the player can choose from three options:<ul style="list-style-type: none"><li>• Show Control.</li><li>• Change Configuration (Graphics).</li><li>• Change Sound/Music Volume.</li></ul></li></ol>

## Report

<i>Use Case ID:</i>	C3
<i>Use Case Name:</i>	Report.
<i>Actors:</i>	Players.
<i>Preconditions</i>	The player must be logged into the system.
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The player selects “Report”.</li><li>2. Then the player can choose from three options:<ul style="list-style-type: none"><li>• Report about the problem.</li><li>• Report a bug.</li><li>• Give us feedback.</li></ul></li></ol>

### Score Board

<i>Use Case ID:</i>	C4
<i>Use Case Name:</i>	Score Board.
<i>Actors:</i>	Players.
<i>Preconditions</i>	The player must be logged into the system.
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The player selects "Score Board".</li><li>2. Then the player can choose from three options:<ul style="list-style-type: none"><li>• View Scores.</li><li>• Reset Score Board .</li></ul></li></ol>

### Rate the System

<i>Use Case ID:</i>	C5
<i>Use Case Name:</i>	Rate the System
<i>Actors:</i>	Player
<i>Preconditions</i>	The user must be registered in the system.
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The user chooses "Rate the System"</li><li>2. The user chooses from 0 to 5 stars"</li><li>3. User clicks "Send"</li></ol>

### Quit

<i>Use Case ID:</i>	C6
<i>Use Case Name:</i>	Quit.
<i>Actors:</i>	Players.
<i>Preconditions</i>	The player must be logged into the system.
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The player selects "Quit".</li></ol>

### 1.9.4 Support team:

- View feedback about the system.
  - View feedback of players.
- View player's reports.
  1. Read the report.
  2. Fix the system.
- Update the system.
  - Upload the new patch.

#### *View players feedback about the system*

<i>Use Case ID:</i>	D1
<i>Use Case Name:</i>	View player's feedback about the system.
<i>Actors:</i>	Support team.
<i>Preconditions</i>	<ol style="list-style-type: none"><li>1. The Support team must be registered in the system.</li><li>2. The player should exist in the system.</li></ol>
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The Support team selects “view feedback”.</li></ol>

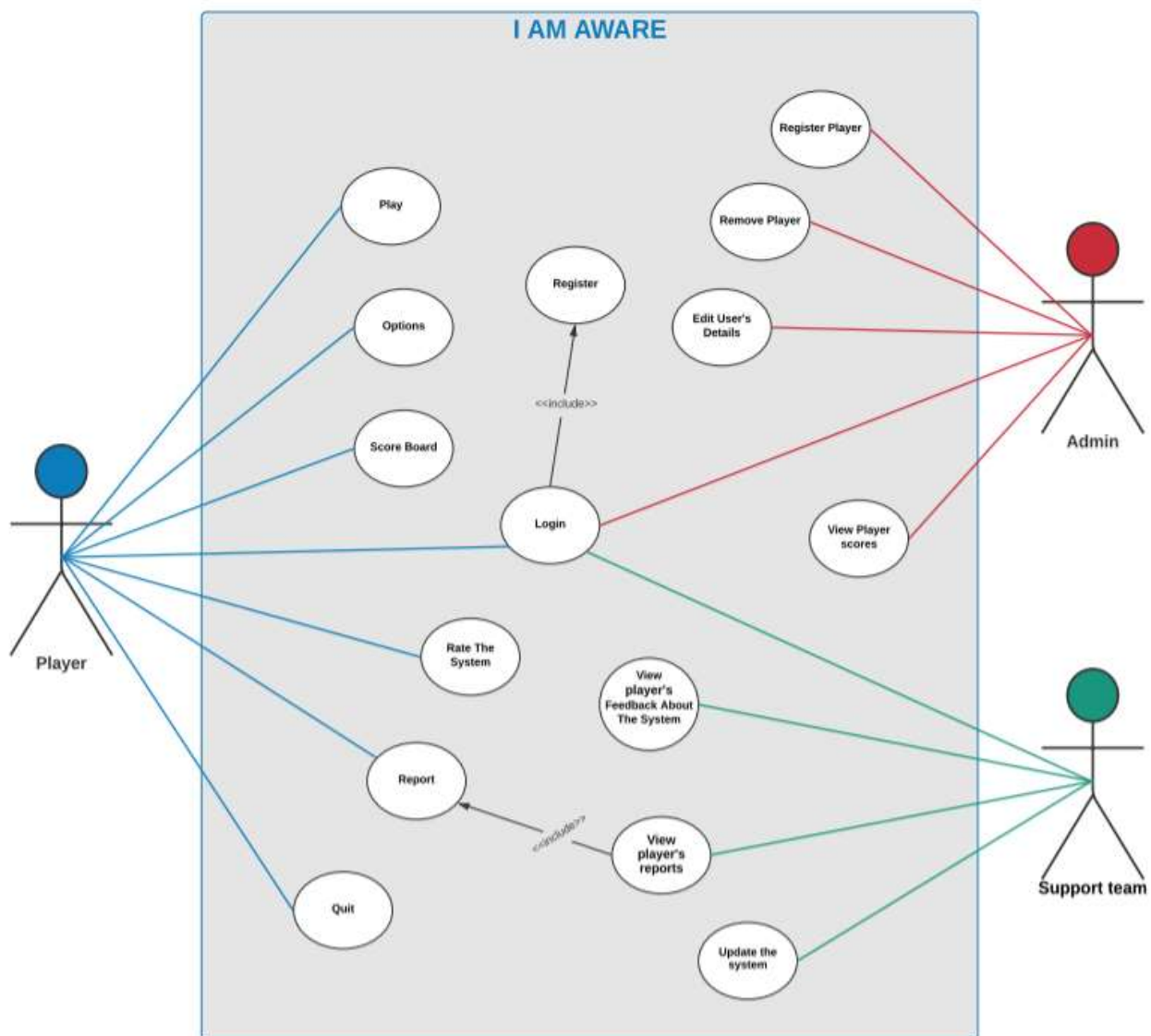
#### *View player's reports*

<i>Use Case ID:</i>	D2
<i>Use Case Name:</i>	View player's reports.
<i>Actors:</i>	Support team.
<i>Preconditions</i>	<ol style="list-style-type: none"><li>1. The Support team must be registered in the system.</li><li>2. The player should have sent a report.</li></ol>
<i>The flow of Events of the Primary Scenario:</i>	<ol style="list-style-type: none"><li>1. The Support team selects “view Reports”.</li></ol>

## Update the system

Use Case ID:	D3
Use Case Name:	Update the system.
Actors:	Support team.
Preconditions	<ol style="list-style-type: none"> <li>1. The Support team must be registered in the system.</li> <li>2. The patch is ready to upload.</li> </ol>
The flow of Events of the Primary Scenario:	<ol style="list-style-type: none"> <li>1. The Support team selects “Update the System”.</li> <li>2. Upload the new patch.</li> </ol>

### 1.10 Use case Diagram

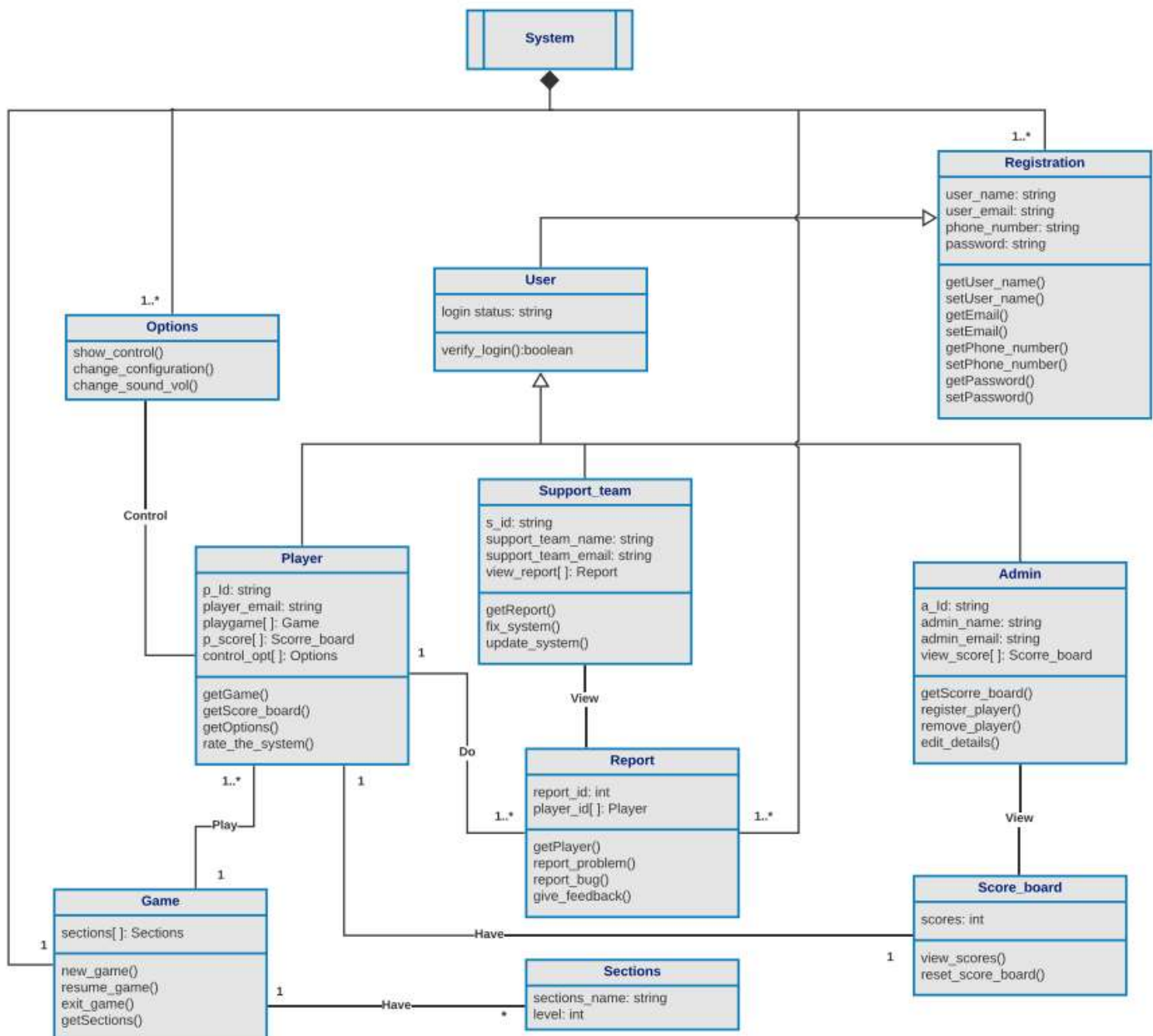


## PHASE 2: DOMAIN DESIGN AND STRUCTURING

### 2.1 Converting use cases to class diagram

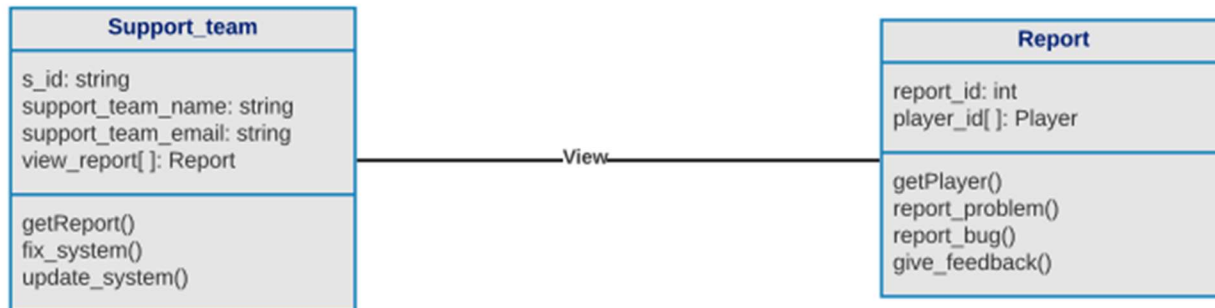
Here is the class diagram which converted based on the use case diagram, converting actors into different classes with some additional classes, and from use cases to methods performed by different classes. You can see the whole class diagram below with associations, multiplicity, and generalization between classes.

### 2.2 UML class diagram

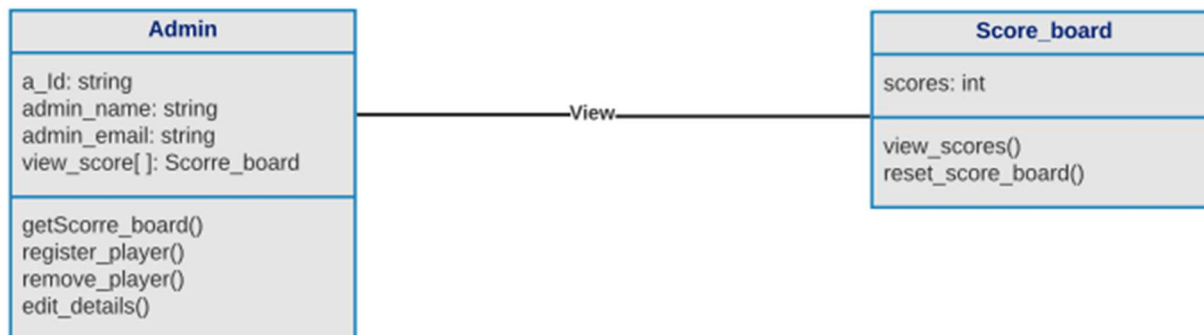


## 2.2.1 Association

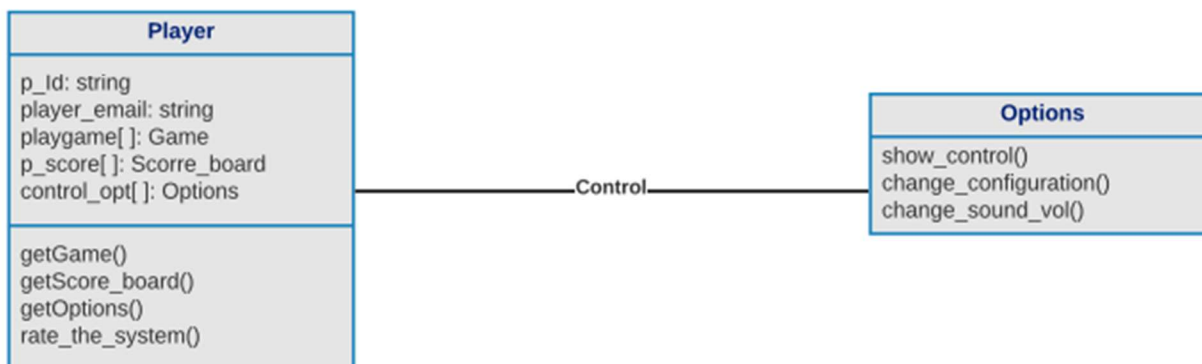
-Support\_team can view Reprt.



-Administrator can view the score\_board.

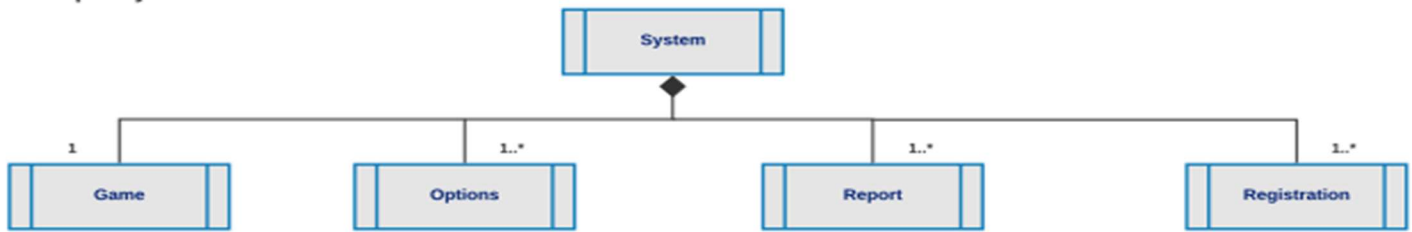


-Player can control the options.

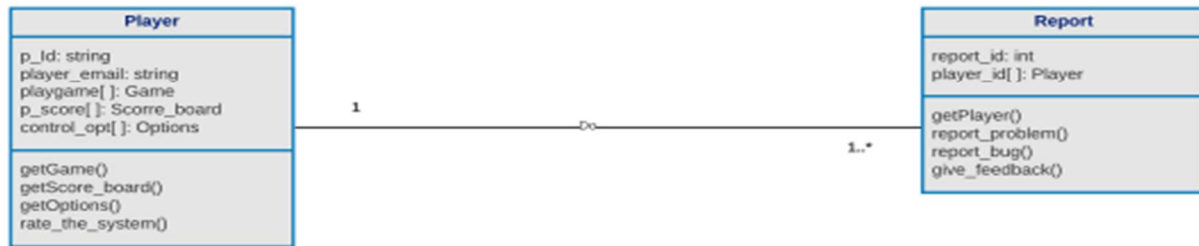




## 2.2.2 Multiplicity



-The system can have only one game, one or many options, one or many reports and one or many registration.



-One player can write one or many reports, that report can be written by only one player



-One player can have only one score\_board, that score\_board can be owned by only one player.

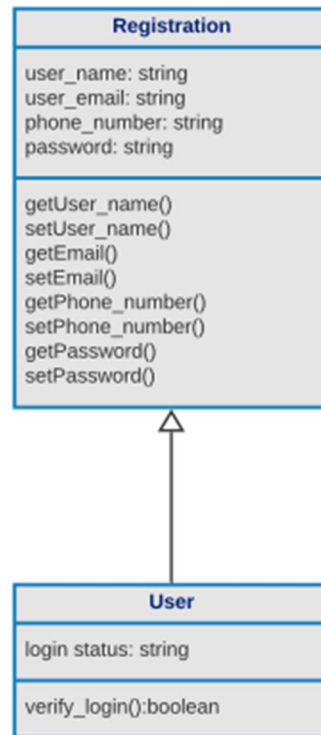


-One or many player can play only one game, that game can be played by one or many player.

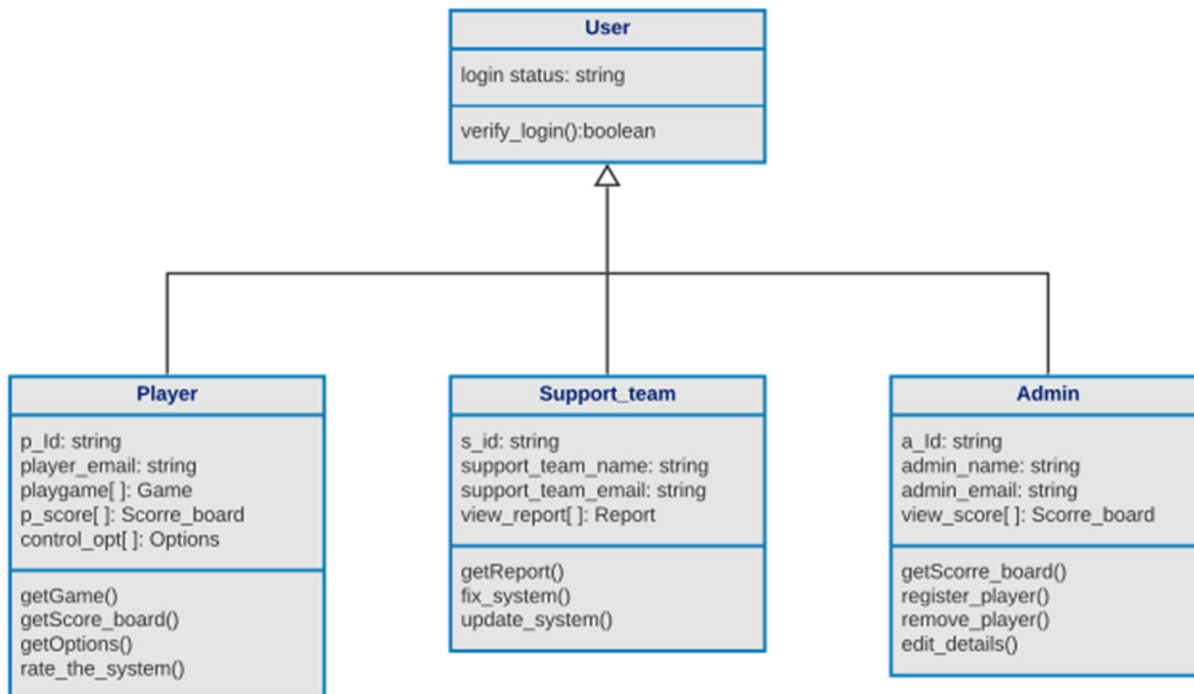


-One game can have many sections, that sections can be owned by only one game.

## 2.2.3 Generalization



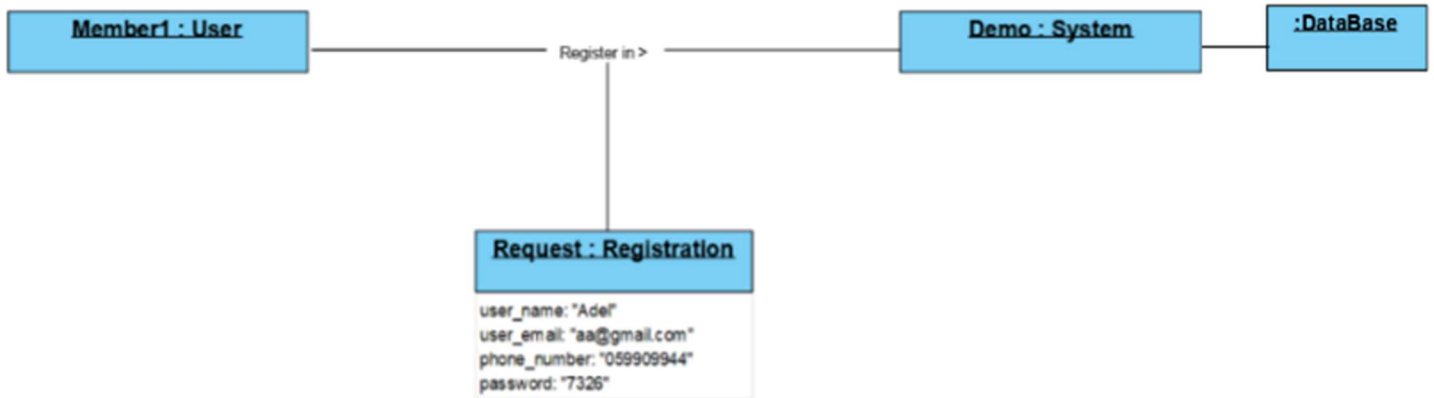
-The user class (chiled class) inherits all attributes and operations of the registration (parent class).



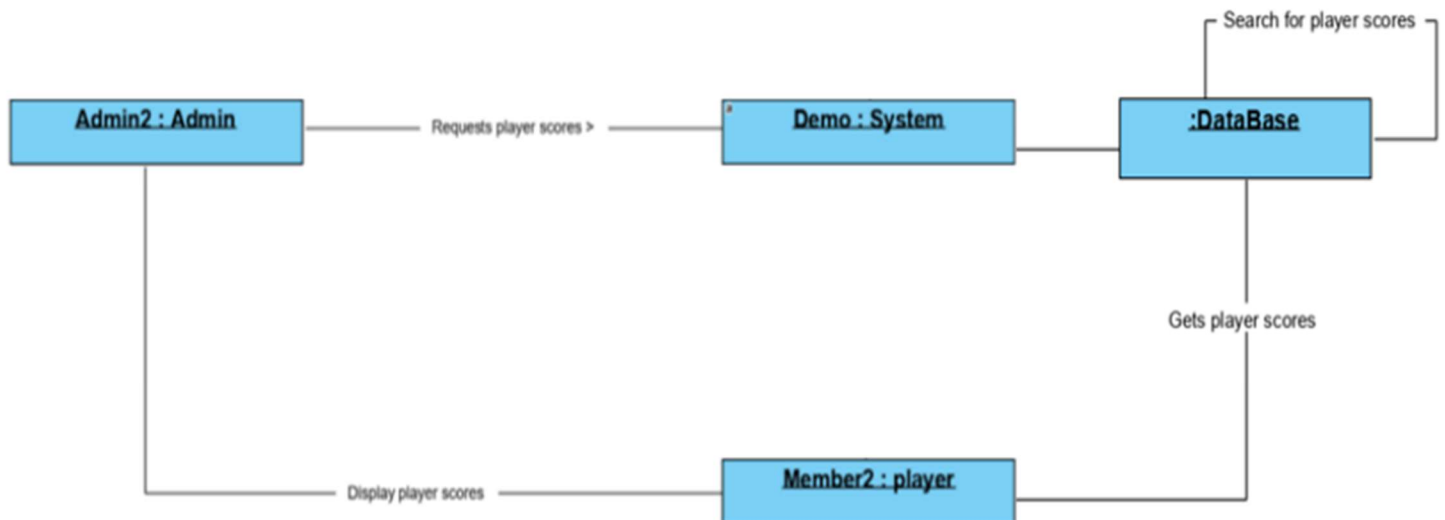
-The player class,support\_team class and admin class all are (chiled classes) inherits all attributes and operations of the user class (parent class).

## 2.3 Object Diagrams

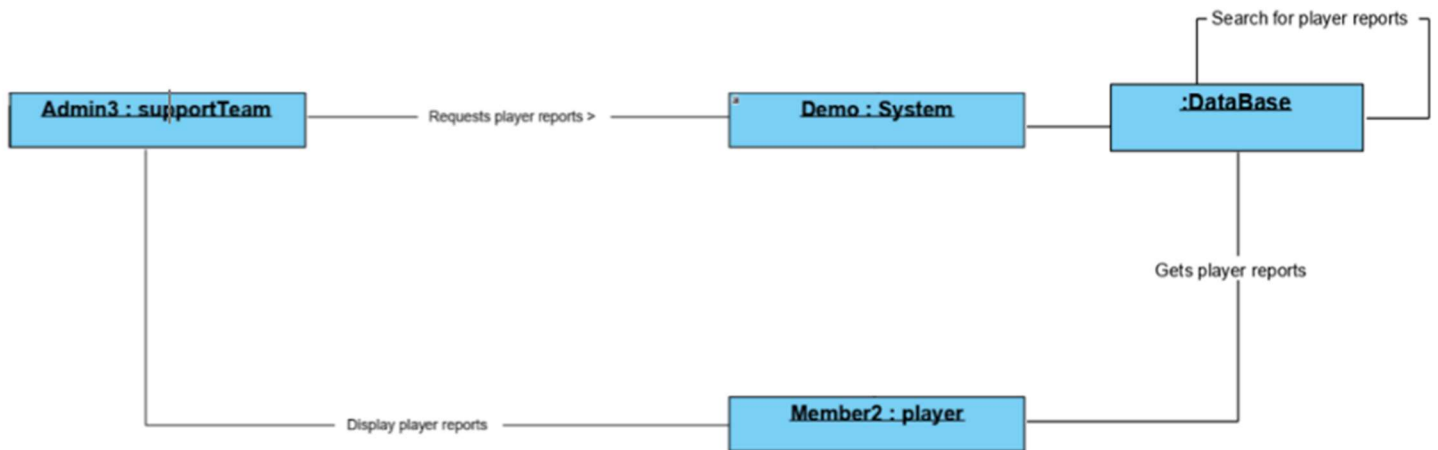
### Registration



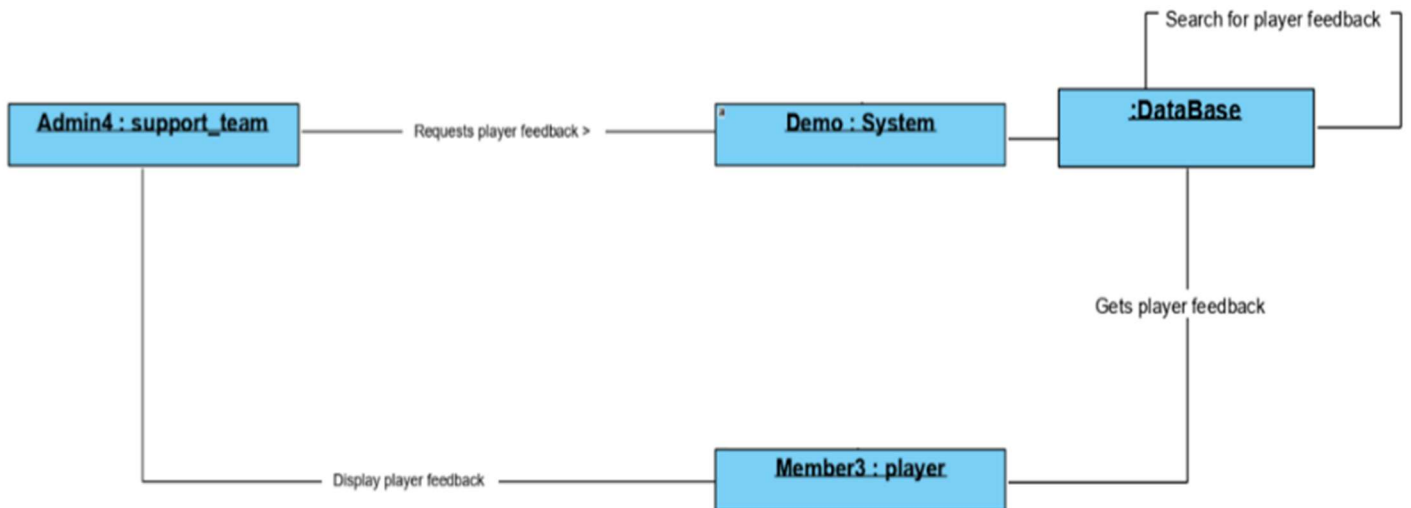
### View player scores



## View player reports



## View player feedback



## PHASE 3: MODELING AND TESTING

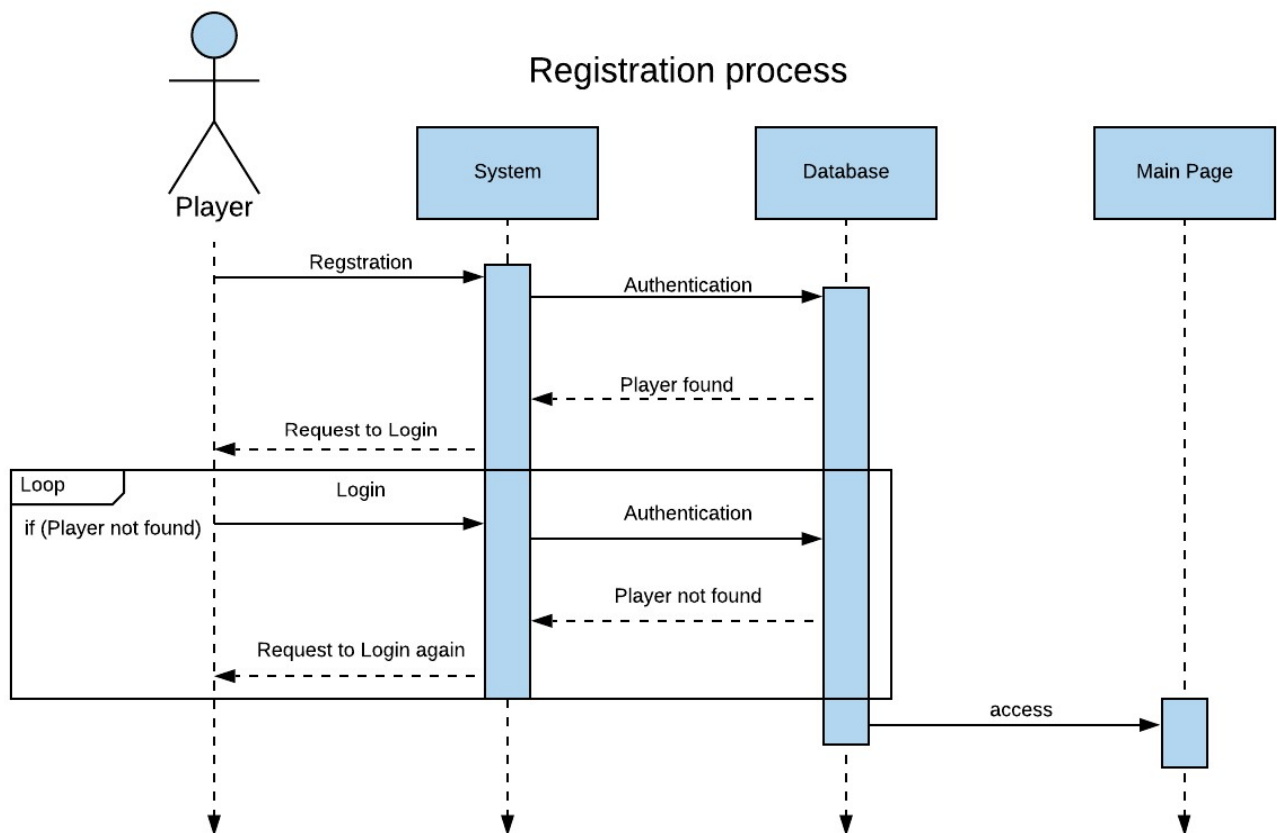
### 3.1 System Modeling & Interaction diagram

#### 3.1.1 Sequence diagram

It shows how the objects interact with each other, in arranged sequence time, it describes the objects and classes sophisticated in the scenario, and the sequence of messages exchanged between the objects.

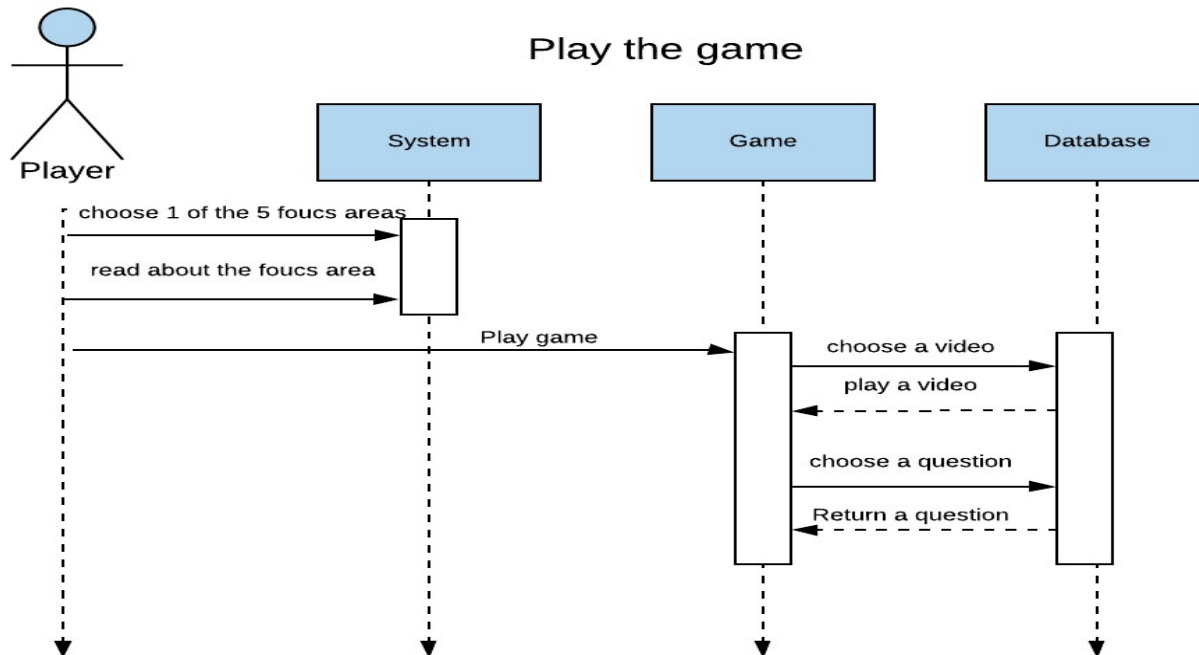
##### 3.1.1.1 Registration process

Describe the sequence of the registration process, from the player trying to register or login, to accessing the main page.



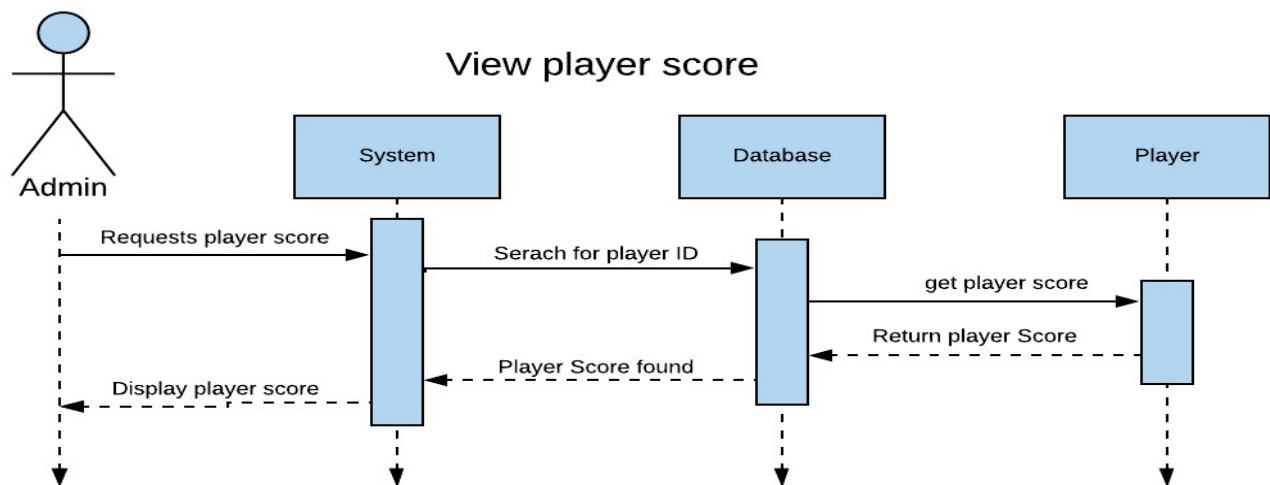
### 3.1.1.2 Playing the game

This sequence diagram shows how the player plays the game through steps, choosing one of the focusing areas, watching a video and answering questions.



### 3.1.1.3 viewing player score

when the admin request to view player score, the request go through sequence steps, from requesting the player score to displaying the score.

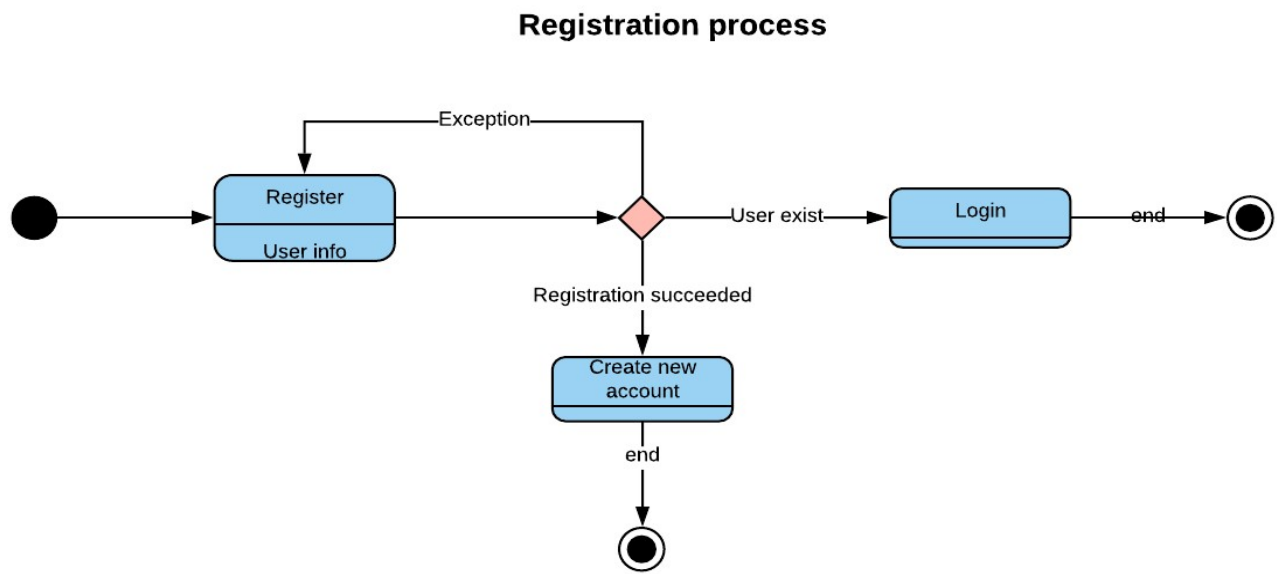


### 3.1.2 State diagram

The purpose of the state diagram is to describe the behavior of systems.

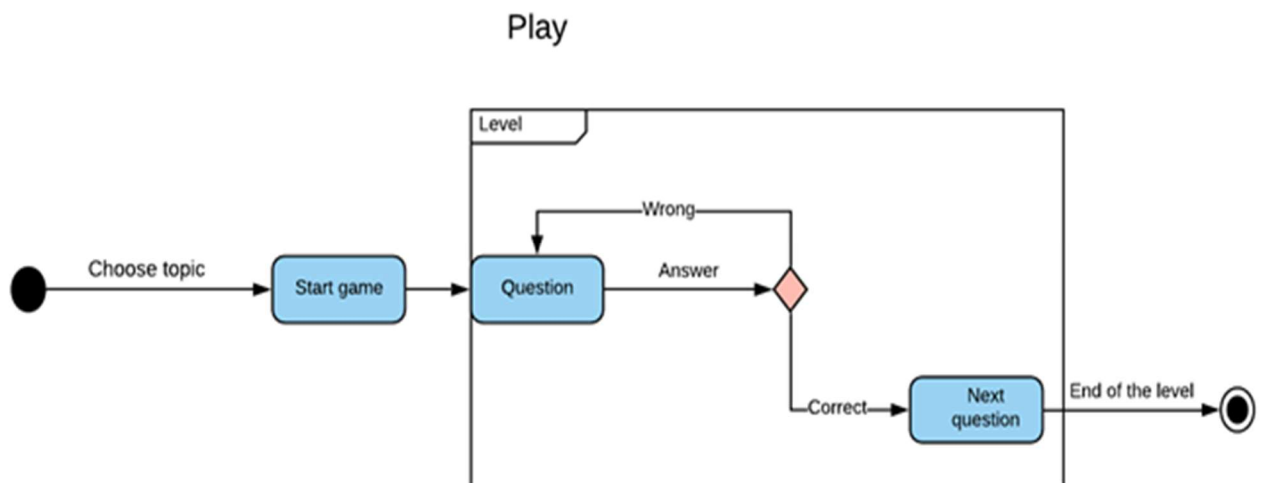
#### 3.1.2.1 Registration process

Here I draw the registration process state diagram and show how the system behavior as illustrated below:



#### 3.1.2.2 Playing the game

The same thing with Play state diagram the whole behaviors are described below:

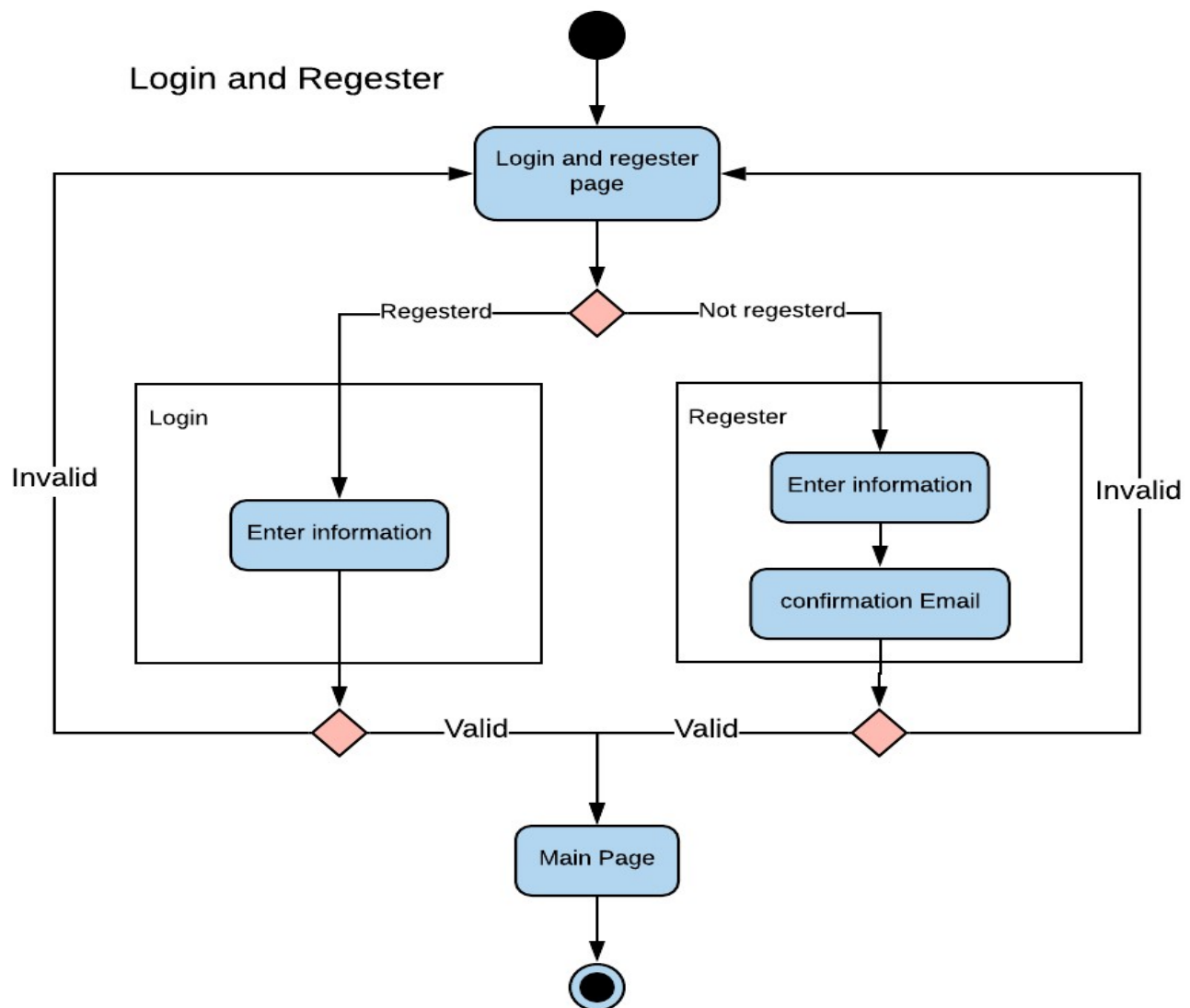


### 3.1.3 Activity diagram

Explain the system control flow and indicate the steps involved in implementing the use case, modeling concatenated and concurrent activities using activity diagrams, the activity diagram focuses on the flow state and the sequence in which it occurs.

#### 3.1.3.1 login and register

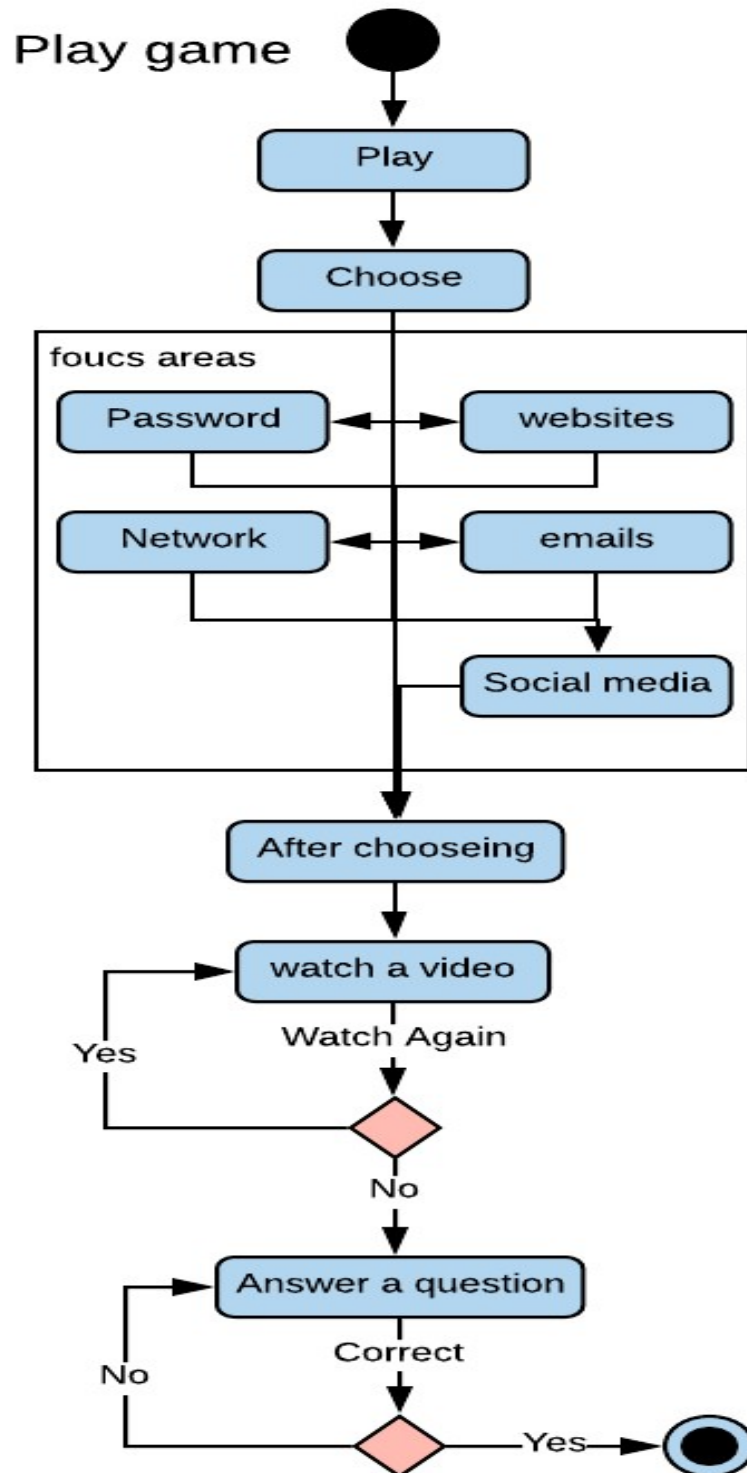
It shows the login and register activity diagram, and if it's valid or not.





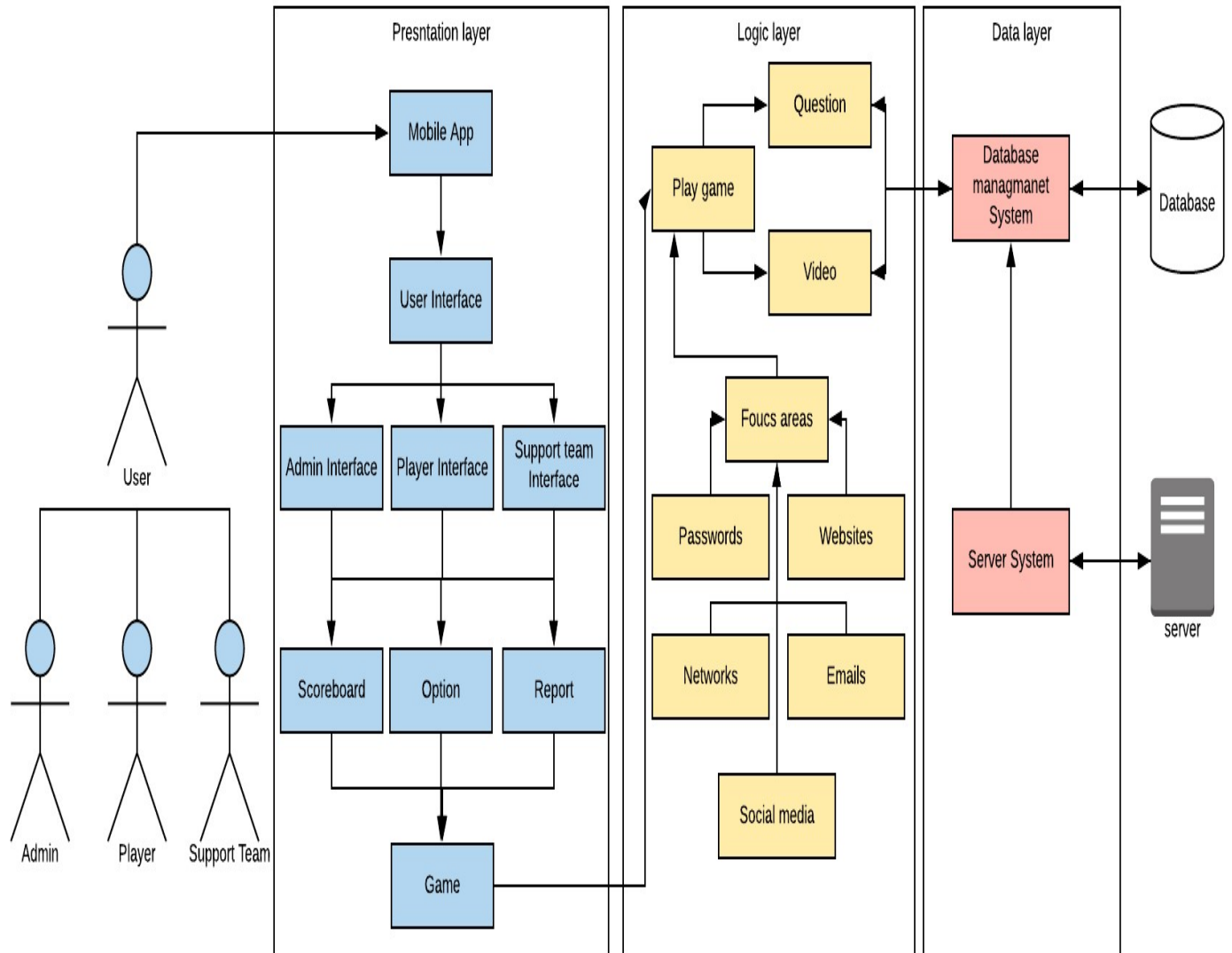
### 3.1.3.2 playing the game

How the activities of playing the game work, and the steps of the whole game.



### 3.1.4 Architecture diagram

It shows the connection between various components, the system includes hardware and software, and these are represented within the graph to indicate the interaction between them, our system architecture diagram contains 3 layers, presentation layer, logic layer, and the data layer.



## 3.2 Testing

### 3.2.1 Objectives

The main objective of testing is to check if the system is working and met the requirement and reached to the standard quality, we will use different methods to apply in some items in our test.

### 3.2.2 Testing Strategy

For all major application functions to work properly, the success percentage in test cases must be more than 95% and there must be no critical errors.

The items to be tested are log in, Scoreboard and Rate functions. For every function, we chose the most appropriate method to apply. Decision table testing will be used in login function, Boundary value analysis for Score Board function and Equivalence partitioning for Rate the system function.

#### 3.2.2.1 Login

In the login process, we must check if the email and password are correct and if not, the system will display a proper message to let the user to identify the problem.

<b>Email</b>	F	T	F	T
<b>password</b>	F	F	T	T
<b>Expected result</b>	Error message" Please enter email"	Error message" Please enter password"	Error message" Please enter email"	Login processed

### 3.2.2.2 Score Board

The score will be from (0 To 1000).

Invalid Partition – Valid Partition Lower Boundary		Invalid Partition – Valid Partition Upper Boundary	
Boundary value just below the boundary	Boundary value just above the boundary	Boundary value just below the boundary	Boundary value just above the boundary
-1	0	1000	1001

### 3.2.2.3 Rate the System

The rate will be from (0 To 5).

Invalid Partition	Valid Partition	Invalid Partition
-1	0	6
-2	.	7
.	.	.
.	.	.
...	5	...

# References

## Phase 1

KAU, FCIT, CPCS351 Slides, Lecture 5 (Chapter 4\_Requirement Elicitation)

[CISCO, What Is Cybersecurity?](#)

[PA consulting, How can you improve cybersecurity awareness in your organization?](#)

## Phase 2

[Visual Paradigm, UML Class Diagram Tutorial](#)

KAU, FCIT, CPCS351 Slides, Chapter 5 - Domain Modeling Part 1

## Phase 3

[Visual paradigm, What is Sequence Diagram?](#)

[Agile Modeling, UML 2 State Machine Diagrams: An Agile Introduction](#)

[GeeksForGeeks, Unified Modeling Language \(UML\) | Activity Diagrams](#)

[Edrawsoft, James Freeman, 12/27/2019, Architecture Diagrams](#)

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