

# CS 353 - Database Systems Spring 2020

## **Group 9 - Project Final Report**

## Scouter

"A Scouting Platform for Football Clubs"

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Section 3	Section 2	Section 3	

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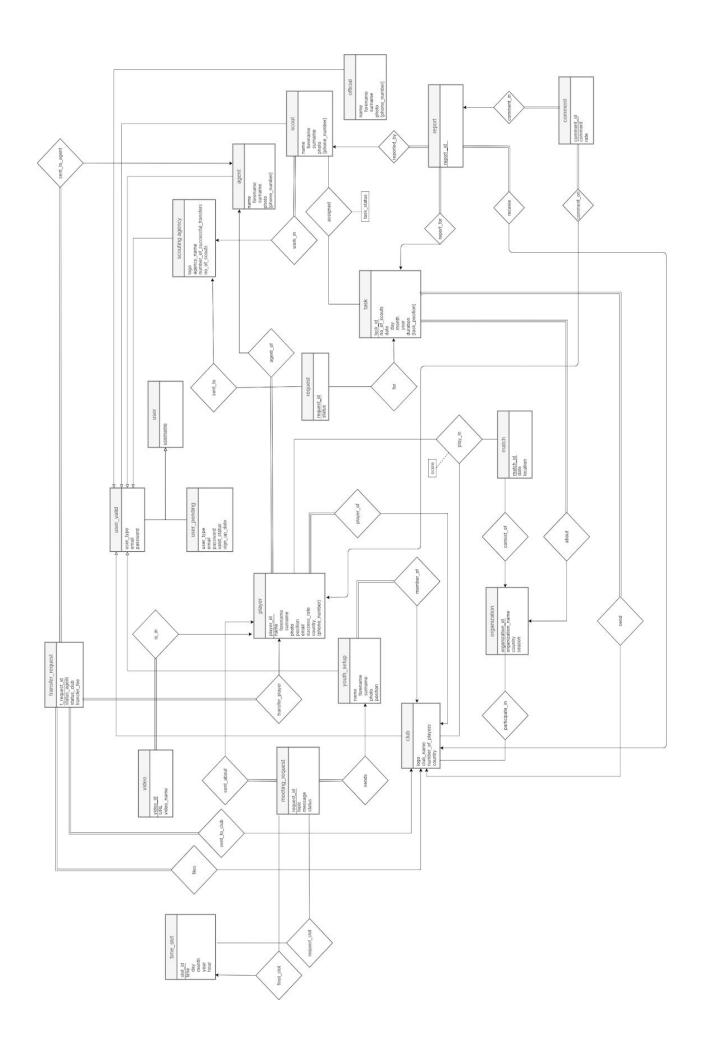
#### 1.0 PROJECT DESCRIPTION

Scouter is a web-based application for providing a scouting platform for football clubs. The application enables the interaction between clubs and scouting agencies , through assigned scouts in search for suitable football players. Through Scouter, interaction in between clubs, to request football players, is maintained. Our system also provides youth setup players of the registered clubs, with a platform to improve themselves via the offered videos of successful players who play in the same position with the particular youth setup player.

The system contains several entities such as football clubs, players, scouting agencies, scouts, youth setup players and agents. Football clubs will be able to request a selected number of scouts from agencies which will then be assigned to specific tasks for a limited time interval. Scouts can report back to clubs, the players they found talented. Football clubs can file transfer offers for the desired players, which can be responded by the players' current club and agent.

In our application, there are seven types of users, Officials, Clubs, Scouts, Scouting Agencies, Agents and Youth Setup players. Officials are able to add tournaments and matches, enter match scores to the system and enter the success rate of the players. Clubs are able to send requests to scouting agencies for a selected number of scouts, in search for suitable football players. They are also able to send transfer requests to the agents and clubs of the offered players and rate the players(?). Scouts, on the other hand, are able to list the players in the system, offer them to clubs and see the past transfers of a particular player. Scouting Agencies are able to assign scouts to the specific tasks. Youth setup players can view the videos of the successful players who play in the same position with them.

## 1.1 Final Entity/Relation Model



#### 2.0 RELATIONAL SCHEMAS

## 2.1 Request

#### **Relational Model**

```
request( request_id, task_id, agency_username, status )
FOREIGN KEY: agency_username REFERENCES
scouting agency(username)
```

## 2.2 User\_pending

#### **Relational Model**

```
user_pending( username, user_type, email, password,
valid_status, sign_up_date )
```

## 2.3 User\_valid

#### **Relational Model**

```
user valid( <u>username</u>, user type, email, password)
```

## 2.4 Scouting\_agency

#### **Relational Model**

```
scouting_agency( username, logo, agency_name,
number_of_successful_transfers, number_of_scouts)

FOREIGN KEY:username REFERENCES user valid(username)
```

#### 2.5 Club

#### **Relational Model**

```
club( username, logo, club_name, no_of_players, country )
FOREIGN KEY:username REFERENCES user valid(username)
```

#### 2.6 Task

#### **Relational Model**

```
task( task_id, club_username, organization_id, no_of_scouts,
day, month, year, duration )

FOREIGN KEY: club_username REFERENCES club(username)
FOREIGN KEY: organization_id REFERENCES organization(
organization id)
```

## 2.7 Task\_position

#### **Relational Schema**

```
task_position( task_id, position )
FOREIGN KEY: task id REFERENCES task(task id)
```

## 2.8 Organization

#### **Relational Schema**

```
organization( organization_id, organization_name, country,
season )
```

## 2.9 Organization\_club

#### **Relational Schema**

```
organization club ( organization id, club username )
```

```
FOREIGN KEY: organization_id ) REFERENCES
organization(organization id)
```

#### 2.10 Scout

#### **Relational Model**

```
scout( username, photo, agency_username, forename, surname )
FOREIGN KEY: username REFERENCES user_valid(username)
FOREIGN KEY: agency_username REFERENCES
scouting agency(username)
```

## 2.11 Scout\_phone

#### **Relational Model**

```
scout_phone( username, phone_number )

FOREIGN KEY: username REFERENCES scout(username)
```

## 2.12 Assigned

#### **Relational Model**

```
assigned( task_id, scout_username, task_status )
FOREIGN KEY: task_id REFERENCES task( task_id)
FOREIGN KEY: scout username REFERENCES scout( username)
```

## 2.13 Organization\_club

```
organization_club( organization_id, club_username )
FOREIGN KEY: organization_id REFERENCES
organization(organization_id)
FOREIGN KEY: club username REFERENCES club(username)
```

#### 2.14 Match

#### **Relational Model**

```
match( organization_id, match_id, club1_username,
club2_username, score1, score2, date, location )

FOREIGN KEY: organization_id REFERENCES organization(
organization_id)

FOREIGN KEY: club1_username REFERENCES club(username)
FOREIGN KEY: club2_username REFERENCES club(username)
```

## 2.15 Player

#### **Relational Model**

```
player( player_id, agent_username, club_username, forename,
surname, photo, position, email, success_rate, country)

FOREIGN KEY: agent_username REFERENCES agent(agent_username)
FOREIGN KEY: club username REFERENCES club(username)
```

## 2.16 Player\_phone

#### **Relational Model**

```
player_phone( player_id, phone_number )

FOREIGN KEY: player id REFERENCES player(player id)
```

## 2.17 Agent

```
agent( agent_username, forename, surname, photo )
FOREIGN KEY: agent username REFERENCES user valid(username)
```

## 2.18 Agent\_phone

#### **Relational Model**

```
agent_phone( agent_username, phone_number_)

FOREIGN KEY: agent_username REFERENCES agent(agent_username)
```

#### 2.19 Official

#### **Relational Model**

```
official( username, forename, surname, photo )
FOREIGN KEY: username REFERENCES user valid(username)
```

## 2.20 Offical\_phone

#### **Relational Model**

```
official_phone( username, phone_number )
FOREIGN KEY: username REFERENCES agent(username)
```

## 2.21 Transfer\_request

```
transfer_request( t_request_id, player_id, club_username,
club_username2, agency_username, status_club, status_agent,
transfer_fee )

FOREIGN KEY: player_id REFERENCES player(player_id)
FOREIGN KEY: club_username REFERENCES club(username)
FOREIGN KEY: club_username2 REFERENCES club(username)
FOREIGN KEY: agent username REFERENCES agent(agent username)
```

## 2.22 Youth setup

#### **Relational Model**

```
youth_setup( username, club_username, forename, surname,
photo, position )

FOREIGN KEY: username REFERENCES user_valid(username)
FOREIGN KEY: club_username REFERENCES club(username)
```

#### 2.23 Video

#### **Relational Model**

```
video( video_id, url, video_name, player_id )
FOREIGN KEY: player id REFERENCES player(player id
```

## 2.24 meeting request

#### **Relational Model**

```
meeting_request( request_id, y_s_username, player_id, topic,
message, status, slot_id )

FOREIGN KEY: y_s_username REFERENCES youth_setup(username)

FOREIGN KEY: player_id REFERENCES player(player_id)
```

## 2.25 Request\_slot

```
request_slot( request_id, slot_id )

FOREIGN KEY: request_id REFERENCES meeting_request(request_id)

FOREIGN KEY: slot_id REFERENCES time_slot(slot_id)
```

## 2.26 Time\_slot

#### **Relational Model**

```
time slot( slot( day, day, month, year, duration, hour )
```

## 2.27 Report

#### **Relational Model**

```
report( report_id, task_id, scout_username, club_username)

FOREIGN KEY: scout_username REFERENCES scout(username)

FOREIGN KEY: club_username REFERENCES club(username)

FOREIGN KEY: task id REFERENCES task(task id)
```

#### 2.28 Comment

#### **Relational Model**

```
comment( report_id, player_id, comment, rate )
FOREIGN KEY: report_id REFERENCES report(report_id)
FOREIGN KEY: player id REFERENCES player(player id)
```

## 2.29 play\_in

```
( club_username, match_id, player_id, score )

FOREIGN KEY: club_username REFERENCES club(username)

FOREIGN KEY: match id REFERENCES match(match id)
```

```
FOREIGN KEY: player id REFERENCES player (player id)
```

## 2.30 final\_slot

#### **Relational Model**

```
( request_id, slot_id )

FOREIGN KEY: request_id REFERENCES meeting_request(request)

FOREIGN KEY: slot id REFERENCES time slot(slot id)
```

#### 3.0 IMPLEMENTATION DETAILS

Scouter is a web application developed with the use of Visual Studio and the ASP.NET Core framework. For this purpose, as a toolset, Razor pages are used, which have cshtml extensions, and are written in razor language, which combines C# and HTML languages. For the project, Model-View-Controller design pattern is implemented. As for the front-end development, razor language is used and the back-end of Scouter is implemented in C#, the project has its database implemented in SQLite.

For this purpose, Model files are used to set the content of the database tables, and database is accessed and modified through the use of ViewModel files. These ViewModel classes are used to pass information from the razor view pages and gather data from the database in turn. In order for such a data transfer, ViewModel classes are passed through the corresponding Controller classes, to the database, in order to obtain an MVC pattern.

Throughout the development of Scouter, one of the most challenging parts was sticking to the naming conventions of the components. The reason behind this is that the environment requires controller names to be matched with view folders and the controller methods to be in the same name as the corresponding views in those folders, which are called upon the View() method from within the controller classes.

Apart from the naming conventions, the research part was a great challenge since there are only a few sources which combine SQLite and ASP.NET Core Web Application template in the VisualStudio environment, which also uses the Model View Controller pattern. Therefore, the data-gathering and the understanding of partial resources was tough.

All group members contributed to the term project, equally, during all parts of development of Scouter. Also considering the given circumstances, we found it best to go through the steps one by one, altogether, regarding the high dependencies among the project parts.

#### 4.0 ADVANCED DATABASE COMPONENTS

#### 4.1 Views

#### 4.1.1 Player List of The Club User View

This view lists the players of the current user of type club. (See Club Home Page in the following sections.)

```
CREATE VIEW players_of_club ( player_id, agent_username,
forename, surname, photo ) AS
SELECT P. player_id, P.agent_username, P.forename, P.surname,
P.photo
FROM Player P,
WHERE club username = @username
```

### 4.1.2 Recommended Players For Youth Setup View

This view lists the players who play in the same position with the current user of type Youth Setup Player. (See Youth Setup Home Page in the following sections.)

```
CREATE VIEW recommended_players ( player_id, forename,
surname, photo ) AS
SELECT P. player_id, P.forename, P.surname, P.photo
FROM Player P,
WHERE position = @position
```

## 4.2 Secondary Indices

For each user club, in the club user home page each player of the particular club is listed. Thus, a secondary index <code>club\_username</code> for the table <code>player</code> may be used for easy access and fast retrieval.

```
CREATE INDEX idx_club ON player(club_username);
```

## 4.3 Reports

❖ For the youth setup players, the maximum success rate for the position that they play in, will be shown in the home page in the actual implementation when completed.

```
SELECT MAX (success_rate)
FROM Player P
WHERE P.position = @position
GROUP BY P.position
```

Position	Max(success_rate)
Right back	80

Figure 1: Sample Database instance for the max report(@position = Right Back)

#### 4.4 Constraints

For the registration of the user, as a result of PRIMARY KEY constraint on the attribute username, and UNIQUE constraint on the attribute email two users having the same name or same email cannot be registered to the system. Furthermore because of the PRIMARY KEY constraint on the attribute username and NOT NULL constraint on the attribute email, these areas cannot be left blank during registration. (See Registration page in the following sections.)

```
CREATE TABLE user_valid(
username VARCHAR( 40 ) PRIMARY KEY
usertype VARCHAR(20) NOT NULL
email VARCHAR(64) NOT NULL UNIQUE
password VARCHAR(32) NOT NULL
)
```

Besides, attribute club\_username of the player entity has a FOREIGN KEY constraint on the club, which corresponds to one to many relations between club and player. (See Club Home Page in the following sections for the correspondence.)

```
CREATE TABLE player(
player_id INT PRIMARY KEY AUTO_INCREMENT,
agent_username VARCHAR(40) NOT NULL,
club_username VARCHAR(40) NOT NULL,
forename VARCHAR(25) NOT NULL,
surname VARCHAR(25) NOT NULL,
```

#### 4.5 Stored Procedures

Since, in our system by many of the user types(Scouts, Clubs, Youth Setup players) of our system, the list of the players with their details are retrieved repetitively. Thus, a stored procedure as follows can be created to improve performance.

```
CREATE PROCEDURE player_details
AS
BEGIN
SELECT * FROM player
END
```

## 4.6 Triggers

#### 4.6.1 Before Insertion Of User

Checks if the email syntax is valid. ( See Registration Page )

```
CREATE TRIGGER validate_email_before_insert

BEFORE INSERT ON user_pending

BEGIN

SELECT

CASE

WHEN NEW.email NOT LIKE '%_@__%.__%' THEN

RAISE (ABORT, 'Invalid email address')

END;

END;
```

## 6.0 Sample Output Reports and User Manual

Welcome to Scouter!



Scouter Home Privacy

Are you ready for quality scouting?

Join us now!!

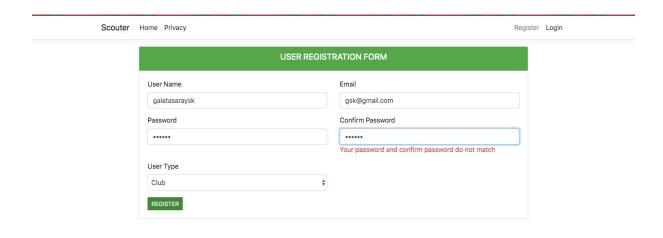
Scouter provides you with an interface where you can easily find players, make transfer requests, communicate with managers and clubs.

Register Login

Our platforms also enables young footballers to watch videos of their dream players and contact with them.

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From the Welcome Page, the user can either choose to register or to login to their already existing accounts, through the links in the upper right corner.



Upon clicking the "Register" link on the Welcome Page, users are directed to the User Registration Form, where they enter their username, e-mail, password and the type of the user they want to register as. The options for the user-type are Admin, Club, Agency, Agent and Scout.

Upon clicking the "Register" button users are directed once again to a register page, where they are required to provide further information regarding the type of their account.

	CLUB FURTHER INFORMATION	IFORM
Club Name	Number of Pl	layers
Galatasaray Spor	or Kulübü 20	
Country		
Turkey		
REGISTER		

The figure above shows "Club Further Information Form", which is the respective page for the user type Club. After providing a club name, the maximum number of players and the country information, the "Register" button directs the users to the home page of their newly created accounts.

Scouter Home Privacy galatasaraysk Logout

#### Club Home Page

**Players** 

Create Player Forename

Surname

Position

Position

Youth Setup

Forename Surname

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All registered users, just like in the scenario explained in this section, are redirected to a further information form related to their account types and after the form is complete, are directed to their respective home pages, where they are provided with different functionalities according to their user types.

Further Information Pages for other types of users are provided in other sections.

Upon clicking "Create Player" button located at the home page of Club users, users are directed to a form where they enter the name, surname and position data of the player they wish to add to their club, and thus to the system.

Below, we see that three players are created by the club with username "galatasaraysk".

Scouter Home Privacy galatasaraysk Logout

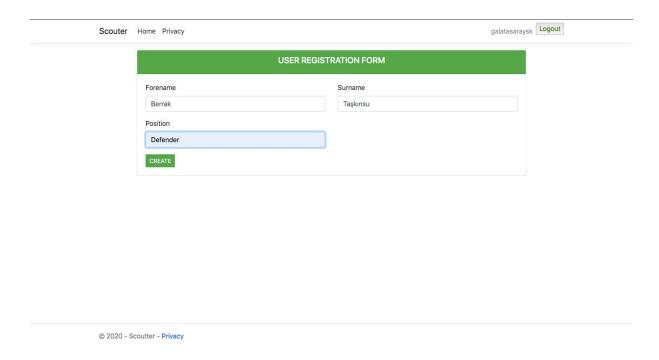


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Scouter Home Privacy

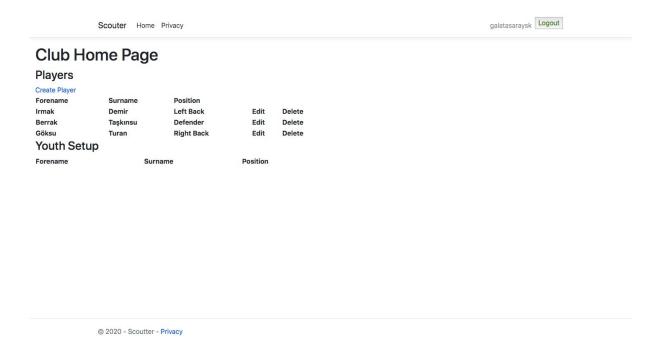
galatasaraysk Logout



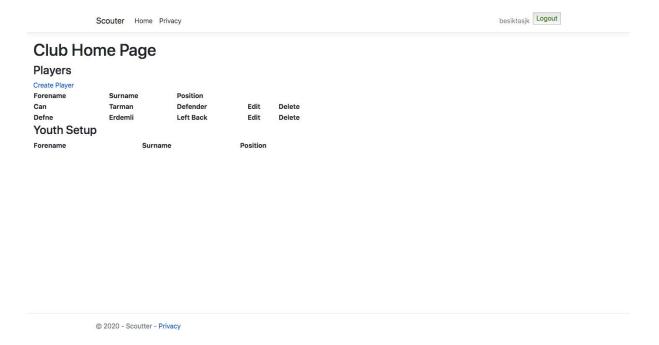


After each creation, the specified player is added and users are directed to home page, where now, since the player list is not empty, they can see the players in their club.

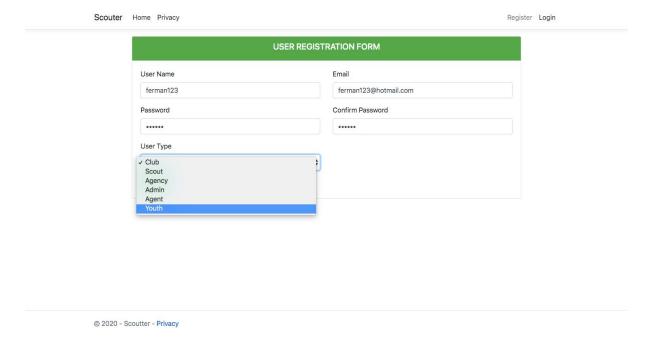
After all three creations, the following is the content of the home page of club with username "galatasaraysk".



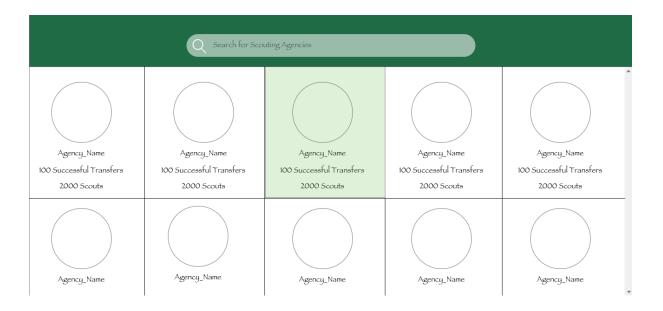
If we were to add a new club with username "besiktasjk" and create two new players as that club, the homepage of the club would be as follows.



Here it can be seen that the query for listing players of the club does not list all players in the system but those who are in the current logged in club.



All scouting agencies are listed with their information including their username, logo, agency name, number of successful transfers and number of scouts unless a keyword is entered to search for an agency by the club as it can be seen from the figure below.



A new task is created by the club as follows.

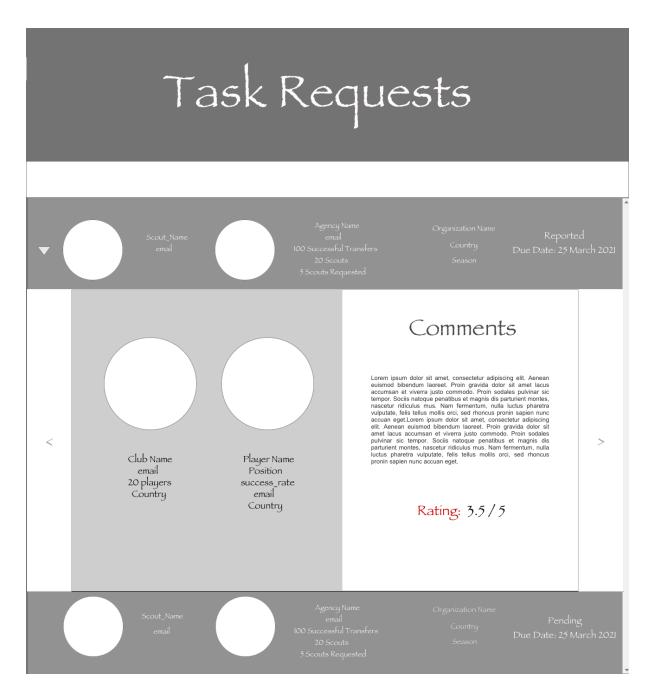
The details of the task are specified by the club, as in the figure below, all organizations are listed for the club to select one among them, and enter other task details.

	Search for Org	anizations		
Organization Name Country Season				
Country	Country	Country	Country	
Season	Season	Season	Season	
Organization Name				
Country	Country	Country	Country	Country
Season	Season	Season	Season	Season
Organization Name				
Country	Country	Country	Country	Country

The request corresponding to the newly created task is sent to the agency as follows.



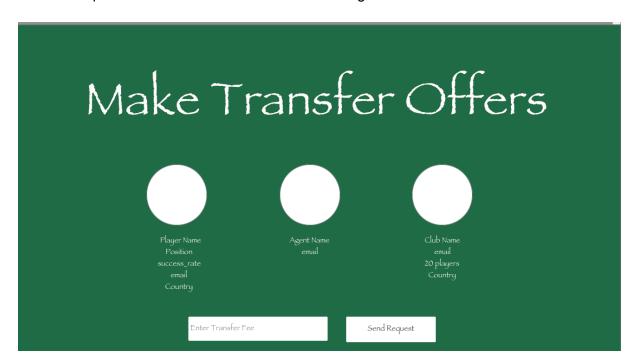
Clubs can see all of their previous requests and further information about them as shown in the figure below.



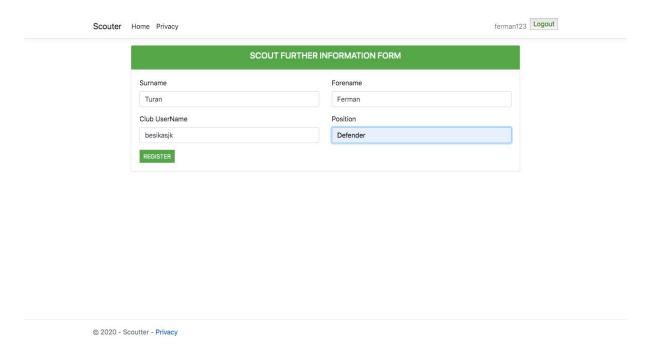
All transfer requests listed to the club by the system.



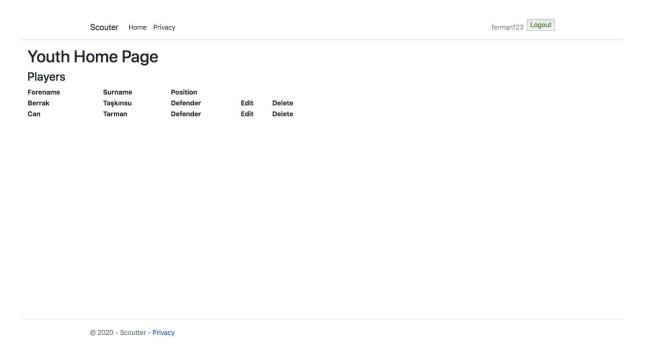
Transfer request is sent to the footballer's club and agent.



When a new youth setup player registers, Scouter asks for the users to also enter the username of the club that they are in, in addition of their name and forename.

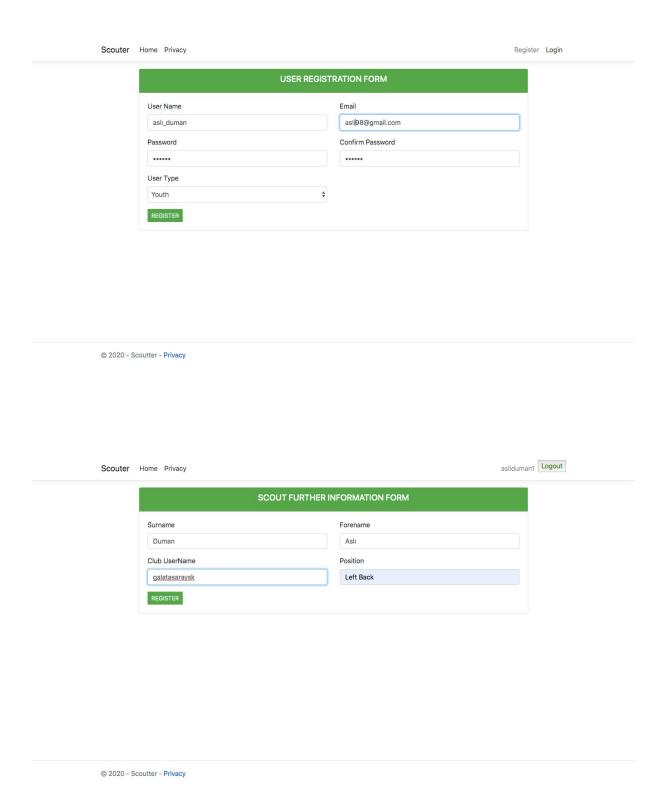


If such a club exists, the system, upon "Register", directs users to his/her homepage. At the homepage of a youth-setup account, users can see a list of all players in the Scouter system who play in the same position of the logged-in youth-setup. Notice here that Berrak Taşkınsu is a member of club "galatasaraysk" whereas Can Tarman is a player in club "besiktasjk", yet, since they play in the same position as our logged-in youth-setup (that is, "Defender"), they are listed at the homepage.

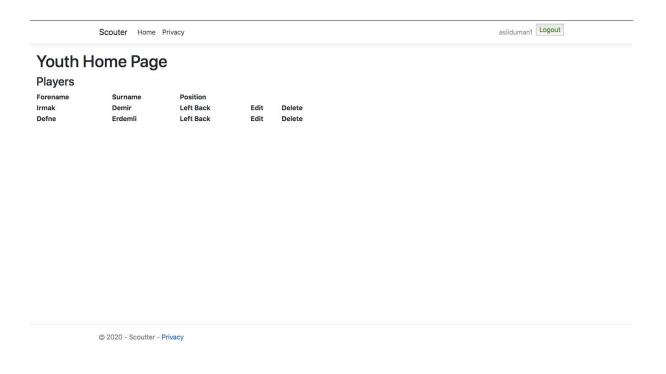


Yet, if a club with the same username provided by the field "Club Username" of "Youth Setup Further Information Form" does not exist in the system, the user is not created.

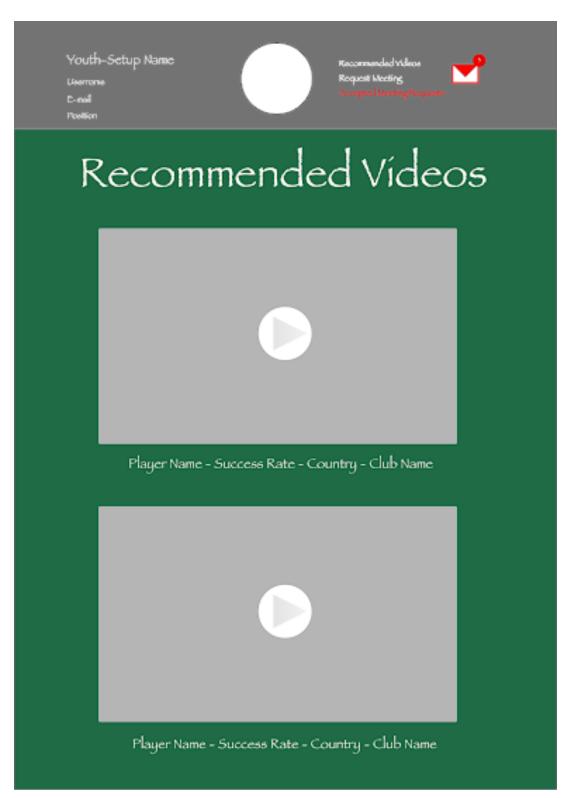
We now register as another youth setup user, with username "asli\_duman" , as a youth-setup member of the club with username "galatasaraysk" this time.



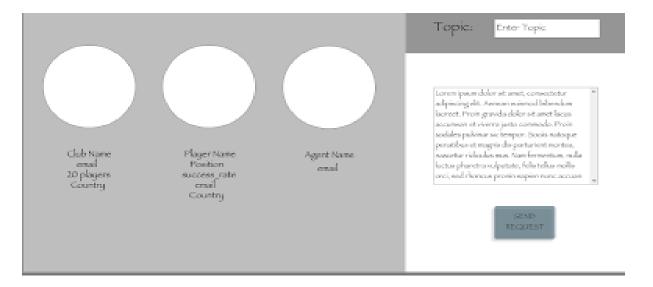
Upon register, we are directed to the home page of the newly created youth-setup. Here, players in the system playing in the same position as our user are lister.



Youth setup will also be able to watch recommended videos and contact with players playing in these videos through their agents, as below.



Youth setup can view recommended videos related to successful players according to their positions.



Youth setup sends a request to an agent of the desired player from a video.

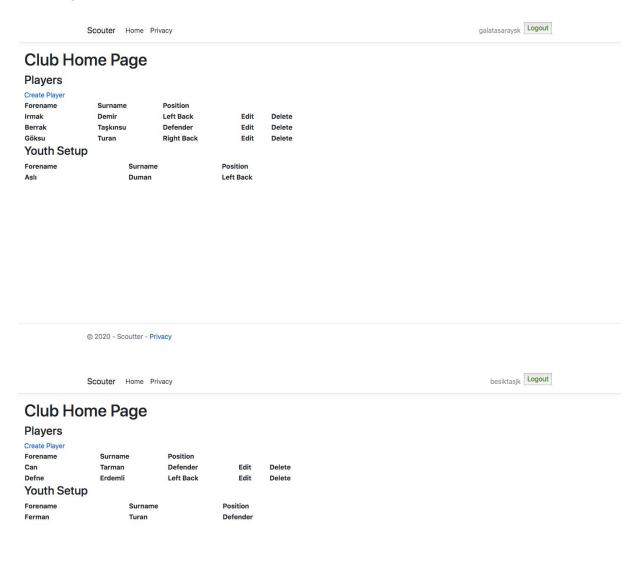
Agent accepts or rejects a request. If accepted, the agent enters player's available time slots to the system and sends a notification related to the meeting request.

# Accepted Meeting Requests Player Message April 2020 Ban $\mathbb{Z}$ pes $1\,\mathrm{pm}$ 2 pm3-pm ± pm

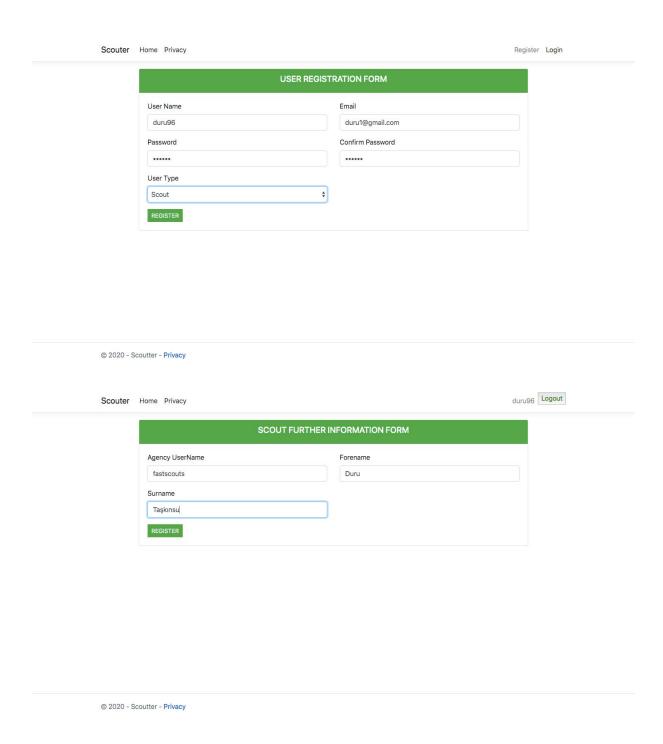
Youth setup selects a time slot from the received available schedule

Club homepage normally has both a list of the current players in the club and the list of the youth setups in the club. Yet, unless a youth setup account is created with the club username at hand given as input, the list will be empty.

Yet, above, we have created two new youth setups, each in a different existing club, "galatasaraysk" and "besiktasjk". Therefore, now each club has a single youth-setup and the homepages are as below.



If the user-type specified is "Scout", the player is directed to a new information form where he/she enters his/her agency username, surname and forename, as below.

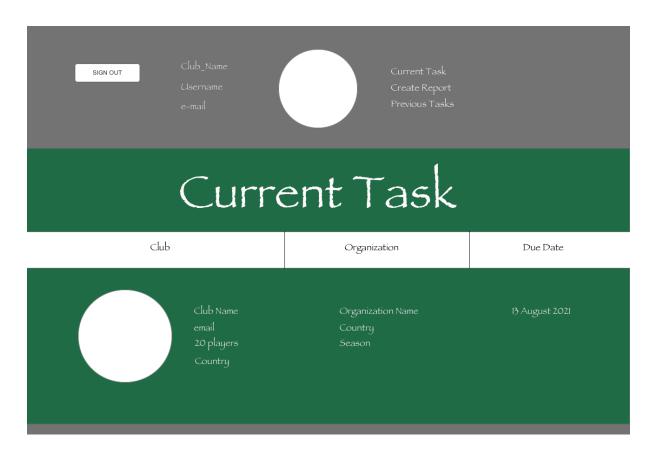


Scouter Home Privacy duru96 Logout

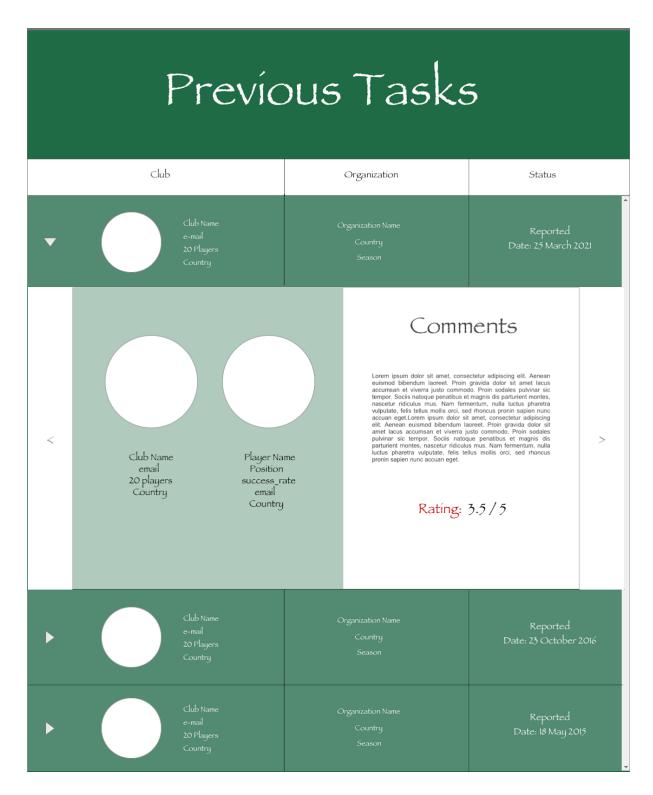
## **Scout Home Page**

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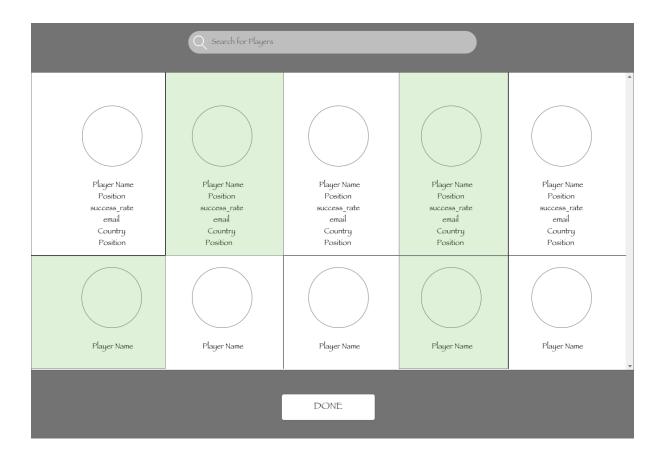
A scout gets notified about the assigned task.



Scouts see their previous tasks.



Assigned scout selects a few number footballers with desired positions from clubs that participate in the organization mentioned in the task. All players with desired position are listed as in the figure below.



Scout comments on each selected footballer, rate them and put it in a report to send it to the club, as shown in the below figure.

## Create Report

Club Name email 20 players Country Player Name Position success\_rate email Country

## Comments

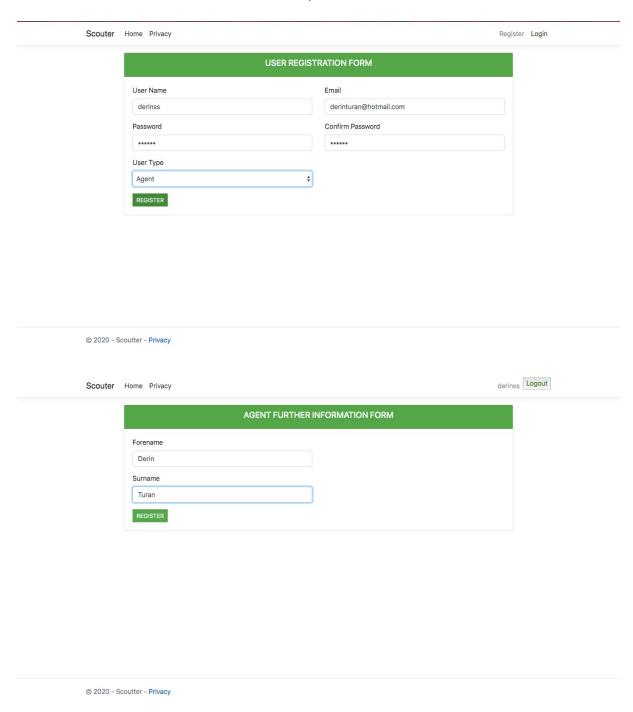
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean euismod bibendum laoreet. Prein gravida dolor sit amet lacus accumsan et viverra justo commodo. Prein sodales pulvinar sic tempor. Sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Nam fermentum, nulla luctus pharetra vulputate, felis tellus mollis orci, sed rhoncus prorin sapien nunc accuan eget.Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aenean euismod bibendum laoreet. Proin gravida dolor sit amet lacus accumsan et vivera justo commodo. Prein sodales pulvinar si tempor. Sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Nam fermentum, nulla luctus pharetra vulputate, felis tellus mollis orci, sed rhoncus pronin sapien nunc accuan eget.

Rating:

Enter Rating

SUBMIT REPORT

If the user-type specified is "Agent", the player is directed to a new information form where he/she enters his/her surname and forename, as below.



Scouter Home Privacy derinss Logout

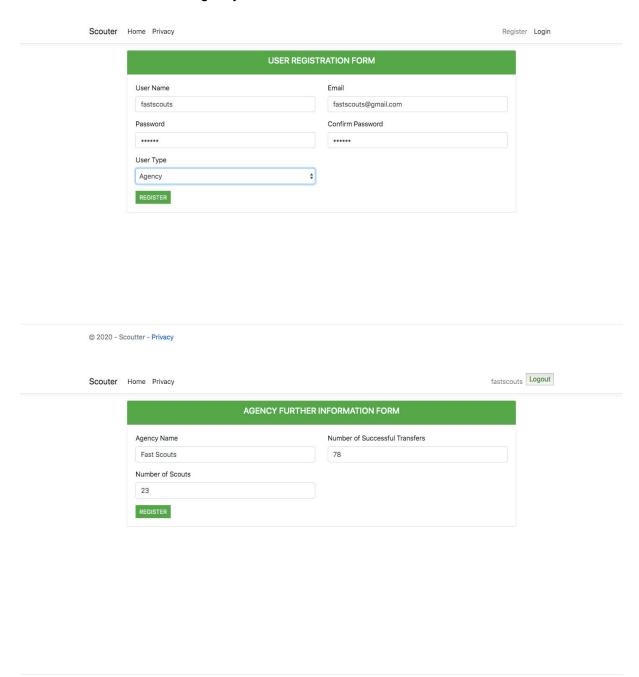
#### **Agent Home Page**

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All transfer requests listed to the agent by the system.



If the user-type specified is "Agency", the player is directed to a new information form where he/she enters his/her agency name, number of scouts in the agency and number of successful transfers of the agency, as below.



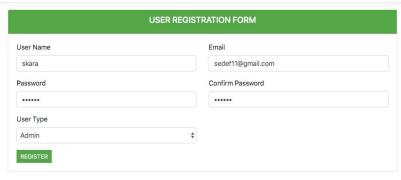
Scouter Home Privacy fastscouts Logout

## Agency Home Page

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If the user-type specified is "Admin", the player is directed to a new information form where he/she enters his/her surname and forename, as below.





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Scouter Home Privacy skara Logout



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## **Admin Home Page**

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## 7.0 WEBSITE

Our project Webpage: <a href="https://irmakdemir1998.wixsite.com/scouter">https://irmakdemir1998.wixsite.com/scouter</a>