Software Requirements Specification

for

Robotic competition organization system

Version <1.5>

Prepared by

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Date: 5.04.2013

Contents

1 Introduction

The software system provides everything from participant registration to the live competition carry out by the referees. It contains web based interfaces and real-time applications such as score and time overlay on video broadcast. Different competition (tournament) formats are needed. As much as possible smart solutions and freely available components shall be used in order to keep the development time short.

1.1 Expected outcome

System design description including component, database and sequence diagrams. Suggestion on database, programming language and reusable components is expected. Creating a project time plan with at least two scenarios (full scope, minimum scope) is secondary objective. Prototype solution covering some part of the system would be a bonus task.

2 Methodology Used

2.1.1 Use Cases

Use case is the description of a scenario or a set of scenarios which are closely linked. A use case defines and describes the interaction between the actors (actors) and specific operating part of the application (System Services). I.e. a use case describes at a high level, systematically and methodically that an application will be used for achieving specific goals. Many cases uses cover eventually all requirements and the desired behavior of the application. The use cases describe system behavior without entering into the details such as ways of implementation.

A use case typically includes many scenarios and gives the possibility to avoid unnecessary information and descriptions of the functions of a system. What we are trying to achieve with the use cases is a comprehensive view of the functions and the behavior of the system software.

The use cases are structured with specific and standard way. This is done through structured description. The components of this structure are:

- Name/short description
- Characters (actors): communicating with the use case
- Conditions (what conditions must be met at the start of the use case)
- Post-Treaty (what conditions must be met at the end of the use case)
- Stimulus (Trigger): an event that triggers the use case
- Relations: Association (association), Include (include), Extend (extend), Specify (generalization):
- Smooth flow Events (description of the behavior of the use case)
- Components flow events
- Alternate streams – exceptions: deviations from the main success scenario

In order to describe the use cases in a structured manner should adopt a form of recording. In the literature there are various forms of recording such as that illustrated in the tables below by Dennis et al and j. Araújo.

Use case	Description
Name	Represents the name of the use case.
Description	Gives a brief description of the use case.
Actors	List of actors that use the use case.
Viewpoints	List of viewpoints associated with the use case.
Primary scenario	Specification of the happy day scenario.
Secondary scenarios	Specification of the other scenarios.
Extends	List of use cases that this use case extends.
Includes	List of use cases that this use case includes.
NFRs	List of NFRs that affect this use case.

Table 1: Use Cases Template Using a Viewpoint-Oriented Requirements Method (J. Araújo)

Use Case Name:	ID:	Importance Level:
Primary Actor:	Use Case Type:	
Stakeholders and Interests:		
Brief Description:		
Trigger:		
Relationships: (Association, Include, Extend, Generalization)		
Normal Flow of Events:		
Subflows:		
Alternate/Exceptional Flows:		

Table 2: use case Description Ingredients according to (Dennis et al. 2005)

2.1.2 Method Analysis of Development & use cases & Scenarios of Robotic System

For the analysis and development of use cases were selected the following recording techniques:

- Text/narrative events,
- Structured description form
- Imaging diagrams using the UML use case diagrams

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These techniques allow recording the gradual enhancement and enrichment of the detail of the use cases and their resolution in interactive scenarios. For the analysis and development of usage scenarios were selected the following recording techniques:

- text/narrative events,
- numbered sequence of steps
- design scribbles

The recording techniques of the above scenarios give the possibility to the reader to easily acquire a global view of each scenario.

The scenarios for each use case analyzed and developed in such a way as to give the possibility to the reader to identify easily the steps, and the flow of events in each scenario. For this purpose, developed interface in the form of sketches handwritten charts.

Deliverable goal is to provide a simple, understandable and accessible to readers who do not hold analysis and software design abilities to read and understand the use cases and scenarios that have been developed.

3 Robotex Use Case scenarios

In this chapter we will deal with the interaction of Robotex scenarios. The structure and the design philosophy and implementation of Robotex allow us to develop interactive scripts in various fields like:

Use Case	Scenario
Competition Registration	New User Approve new user Login / Logout Profile Management
Competition Management	Create / Update General Info Update Specific Information Update Important Dates
Competition Pre-Registration	Participant Registration Registration Checking
Competition Check-In	Arrival checking Robot technical check Create competition schedule Edit competition schedule
Competition Ongoing	Start/Stop match Decide winner Edit score Competition Info
Competition ending	Diploma generation

3.1 Competition Registration Use Case Development

In this section we will analyze all the use cases arising from the above description of the script so as to identify the usage scenarios of Robotex and to record all cases of interaction by users of Robotex with the system.

3.2.1 Competition Registration

In use case form of the following table elaborates on these steps as part of the use case in the Normal Flow of Events.

Use Case Name: Competition Registration	**Importance Level: Intermediate**
Primary Actor: Participant	**Use Case Type: essenial**
Stakeholders and Interests: *Competition participants and referees*	
Brief Description: *At this case there take place three actions: Create account, fill the form,*	
Trigger: *Create competition account*	
Relationships: Association : Include : Initialization, Processing, Development, Customization Extends : Generalization:	
Normal Flow of Events: 1. Create new User 2. Approve User 3. Login/Log out 4. Profile management	
Subflows: SB1.	
Alternate/Exceptional Flows:	

Table 2: Use Case Record Form: Competition Registration

The use case “competition registration” may be illustrated diagrammatically as shown in Figure 3. Goal of imaging is to give the reader a comprehensive and complete picture of the registering system in a Robotex competition and focus on the individual steps that are followed in order to create a representative and customized snapshot of the corresponding action.

Picture 3: Competition registration

3.1.1.1 Use Case Scenarios: Competition Registration

System: ROBOTEX	
User: Competition admin, Referee, Participant, Spectator	
Use case: Competition Registration	
Scenario	**Actions**
New User	Display „new user“ form
	Fill the form with data
	Click the „save“ button
Approve user	Display approve user form
	Tick the “approve” checkbox
	Click the “save” button
Login / Logout	Display „login“ form
	Insert login information
	Click the „login“ button
	Click the „logout“ button
Profile Management	Display the profile editing form
	Edit data that is currently in the form
	Click the „save“ button

3.1.1.2 Scenario: New User

Use Case Scenarios: Competition Registration

Scenario: New User

To enable the system to identify its users, we need to register them. In order to register users to the system, you will need to take the following steps:

Scenario steps:

1. Display „new user“ form
2. Fill the form with data
3. Click the „save“ button

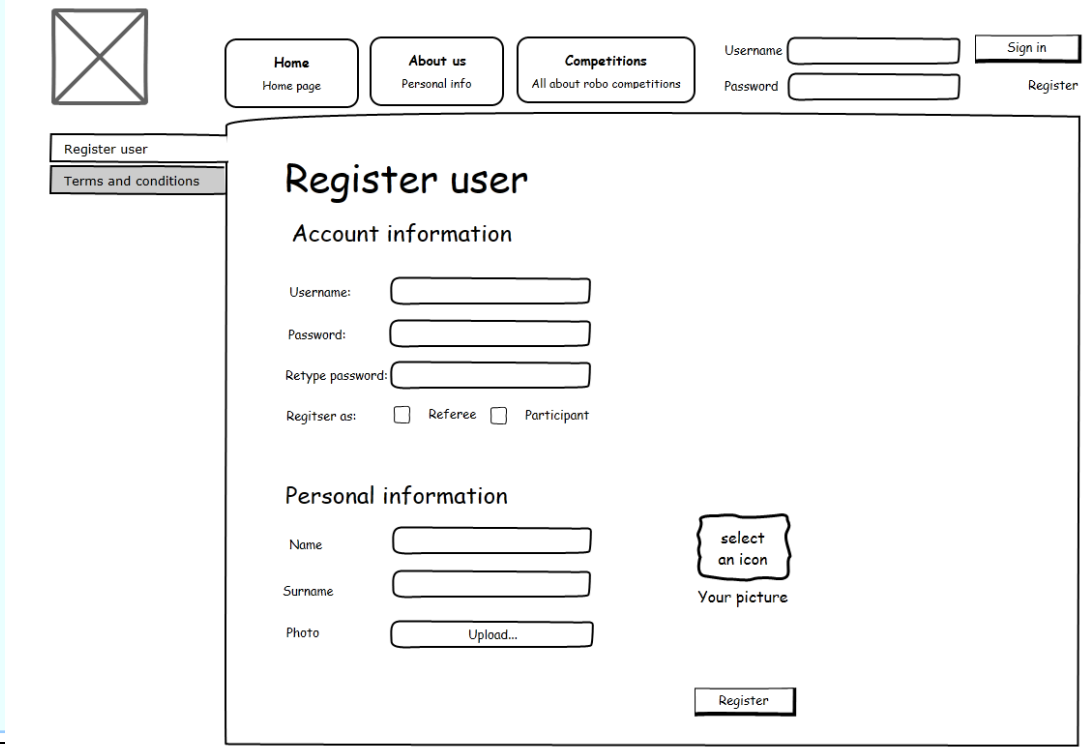
A detailed description of the scenario steps

Step 1: Display „new user“ form
User, that wishes to register to the system, navigates to the „new user“ form.

Step 2: Fill the form with data
The user fills the form with necessary data.

Step 3: Click the „save“ button
After filling the form with data the user clicks the „save“ button. After clicking the „save“ button an account will be created for that user.

Schematic illustration of scenario



3.1.1.3 Scenario: Approve user

Use Case Scenarios: Competition Registration

Scenario: Approve user

In order for the competition manager to have a good overview of the registered users he needs to approve everyone before their account is activated. To approve an account the competition manager need to take the following steps:

Scenario steps:

1. Display „approve user“ form
2. Tick the “approve” checkbox
3. Click the „save“ button

A detailed description of the scenario steps

Step 1: Display „approve user“ form
The competition manager first needs to navigate to the approve user form.

Step 2: Tick the “approve” checkbox
At this form the competition manager sees all yet to be approved users information and approves the ones he sees fit.

Step 3: Click the „save“ button
After approving one or many users the competition manager clicks the save button, after which the accounts for those user(s) will be activated in the system.

Schematic illustration of scenario

Background processes with no UI

3.1.1.4 Scenario: Login/Logout

Use Case Scenarios: Competition Registration

Scenario: Login/Logout

To enable the system to distinguish the current user and its rights, it needs to have the user authenticate. For the user to authenticate he need to take the following steps:

Scenario steps:

1. Display „login“ form
2. Insert login information
3. Click the „login“ button
4. Click the „logout“ button

A detailed description of the scenario steps

Step 1: Display „login“ form
User, that wishes to authenticate himself to the system, navigates to the „login“ form.

Step 2: Insert login information
At the login form the user inserts his username and password.

Step 3: Click the „login“ button
After the user fills in his credentials he needs to click the “login” button. After which the system will check if the user exists and if the user has entered a correct password. Upon verifying the credentials the user will be logged in.

Step 4: Click the „logout“ button
When the user is logged in to the system he can log out at any time. To log out the user need to click the “logout” button.

Schematic illustration of scenario

Background processes with too simple UI

3.1.1.5 Scenario: Profile management

Use Case Scenarios: Competition Registration

Scenario: Profile management

Sometimes users information has been inserted incorrectly or it has just changed, upon which the user will need to change it. For the user to change his profile information he need to take the following steps:

Scenario steps:

1. Display the profile editing form
2. Edit data that is currently in the form
3. Click the „save" button

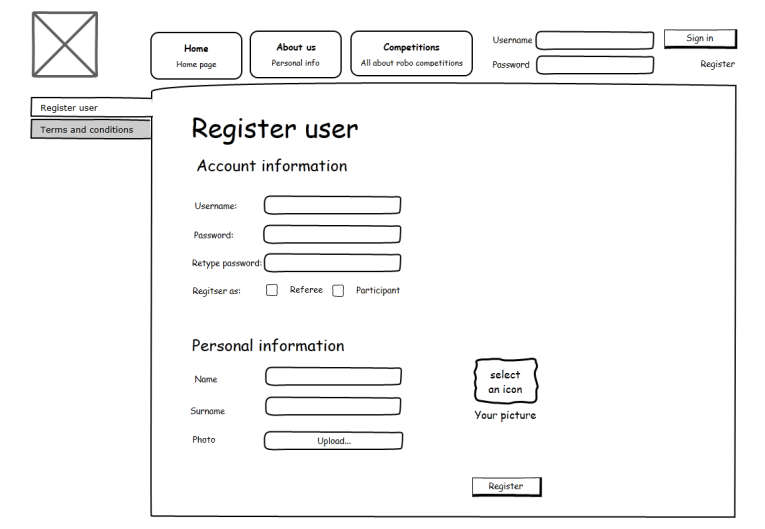
A detailed description of the scenario steps

Step 1: Display the profile editing form
User that wishes to update his information will navigate to the profile editing form.

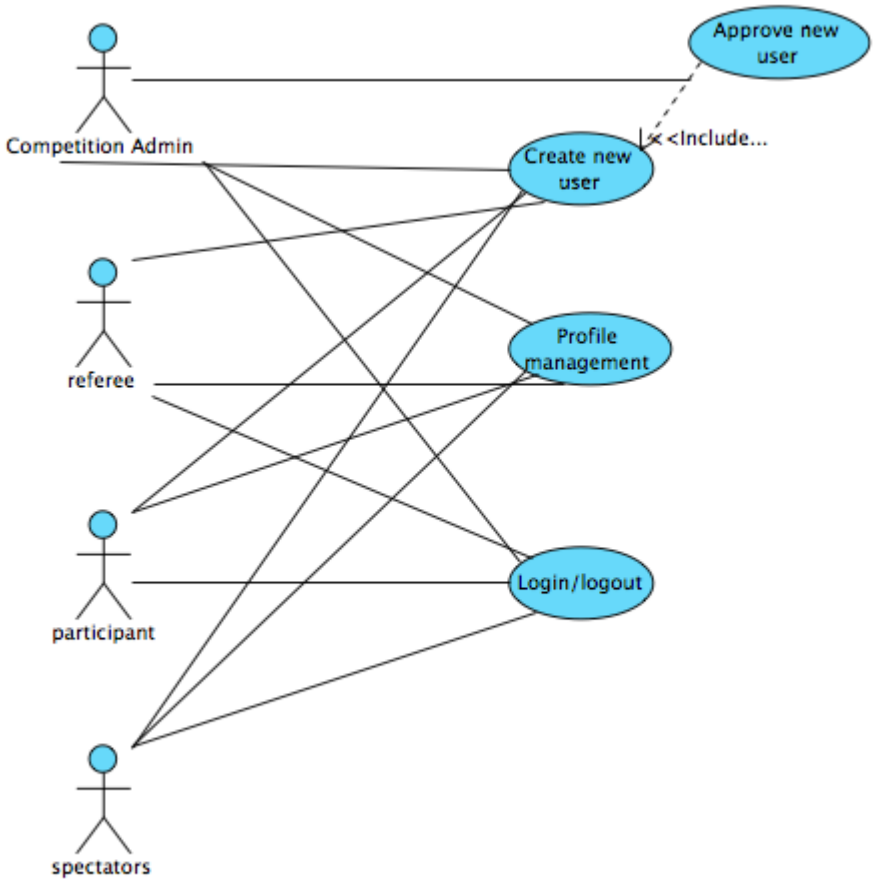
Step 2: Edit data that is currently in the form
The user will then insert or updates the information needed.

Step 3: Click the „save" button
After the user fills in the information needed, he click the "save" button upon which the information will be updated in the whole system.

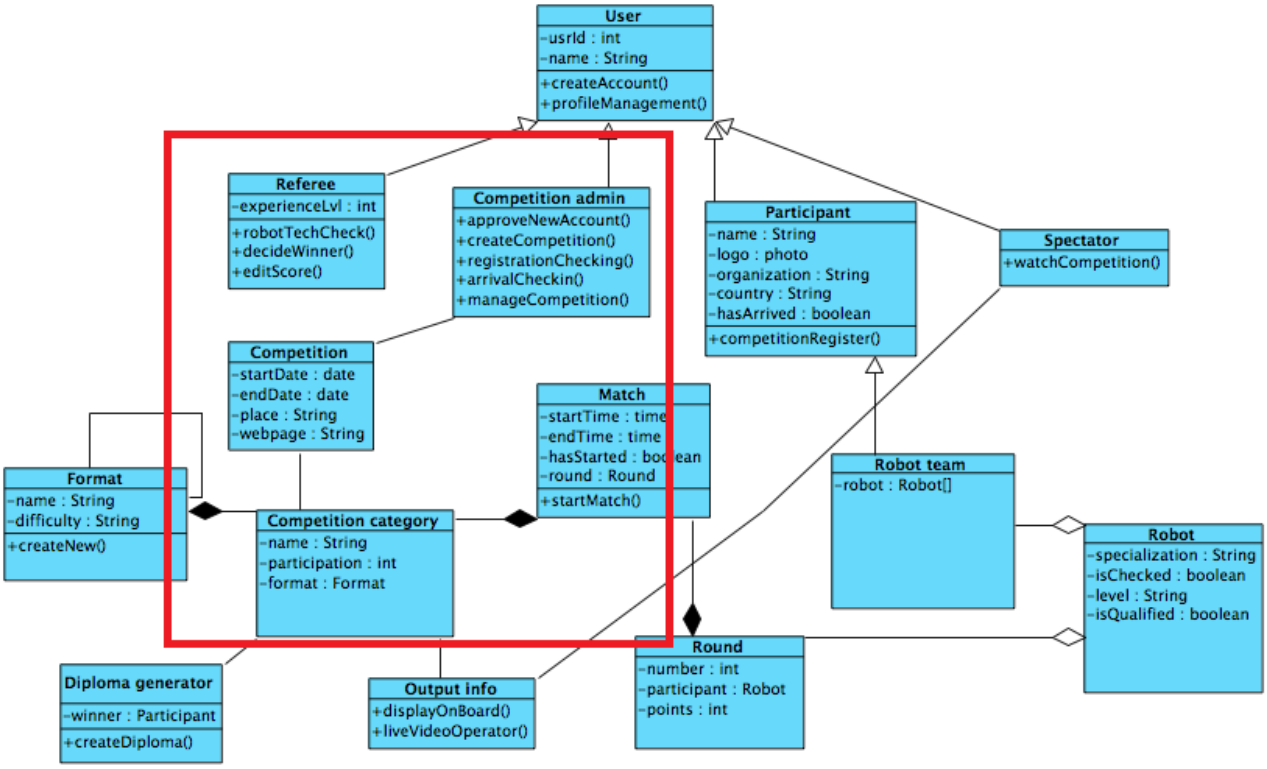
Schematic illustration of scenario



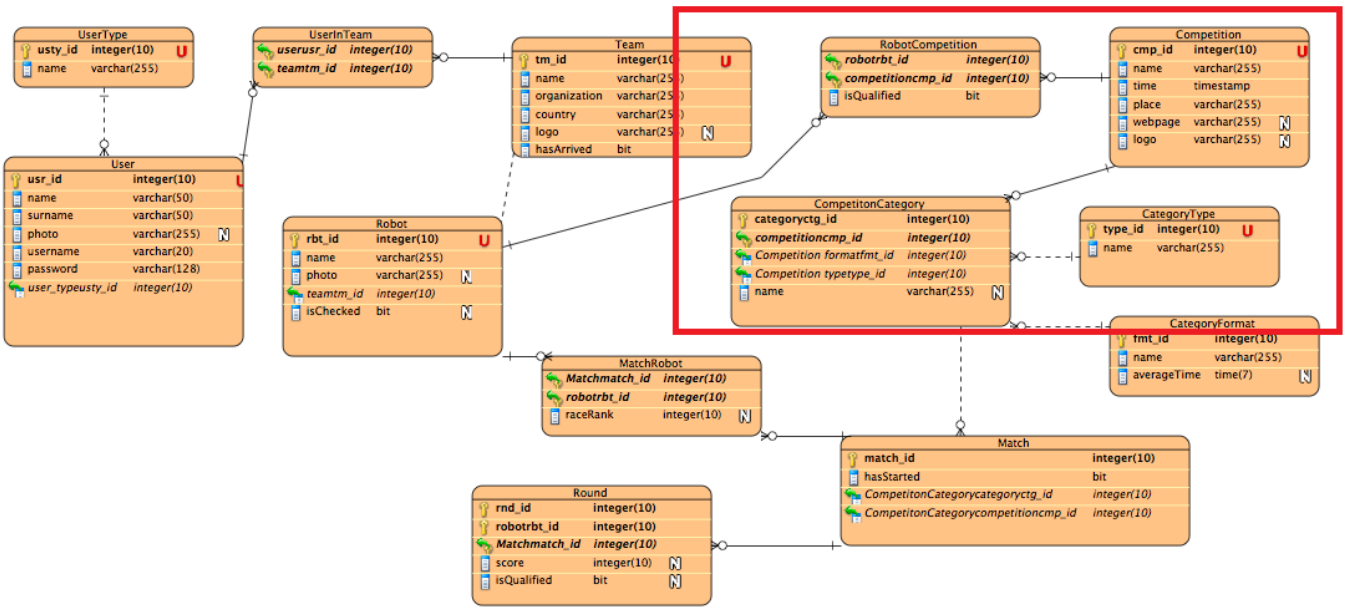
Use Case Diagram: Competition Registration



3.2.2 Class Diagram: Competition Registration



3.2.3 ERD Diagram: Competition Registration



3.2 Competition management Use Case Development

In this section we will analyze all the tasks, that take place in order to manage creation and all updates of a competition as it organized.

Table 5 records use case "competition management"

Use Case Name: Competition Management	**Importance Level: High**
Primary Actor: Competition Administrator	**Use Case Type: Essential**
Stakeholders and Interests: *Administrator, participants*	
Brief Description: *In this use case we manage all tasks for the competition managing before it announced.*	
Trigger: *Create general info, specific info, important dates*	
Relationships: Association : Includes : Create, Update, Announce competition Extends : Generalization :	
Normal Flow of Events: 1. Create general info 2. Announce competition 3. Update Specific Info 4. Announce Important dates	
Subflows: **SB1.**	
Alternate/Exceptional Flows:	

Table 5: Use Case Record Form: Competition Management

3.1.1.6 Use Case Scenarios: Competition management

System: ROBOTEX	
User: Competition admin	
Use case:. Competition management	
Scenario	**Actions**
Create General Info	Display competition creating form
	Fill the form with necessary information
	Click the "save" button
Update General Info	Display the competition general information form
	Edit the forms information
	Click the "save" button
Update Specific Information	Display the competition specific information form
	Edit the forms information
	Click the "save" button
Update Important Dates	Display the competition important dates form
	Edit the forms information
	Click the "save" button

3.2.1.1 Scenario: Create general info

Use Case Scenarios: Competition management

Scenario: Create general info

To create a competition and distinguish it from other competitions, time and place, we need to create a new competition in the system. To create a new competition we need to take the following steps:

Scenario steps:

1. Display competition creating form
2. Fill the form with necessary information
3. Click the "save" button

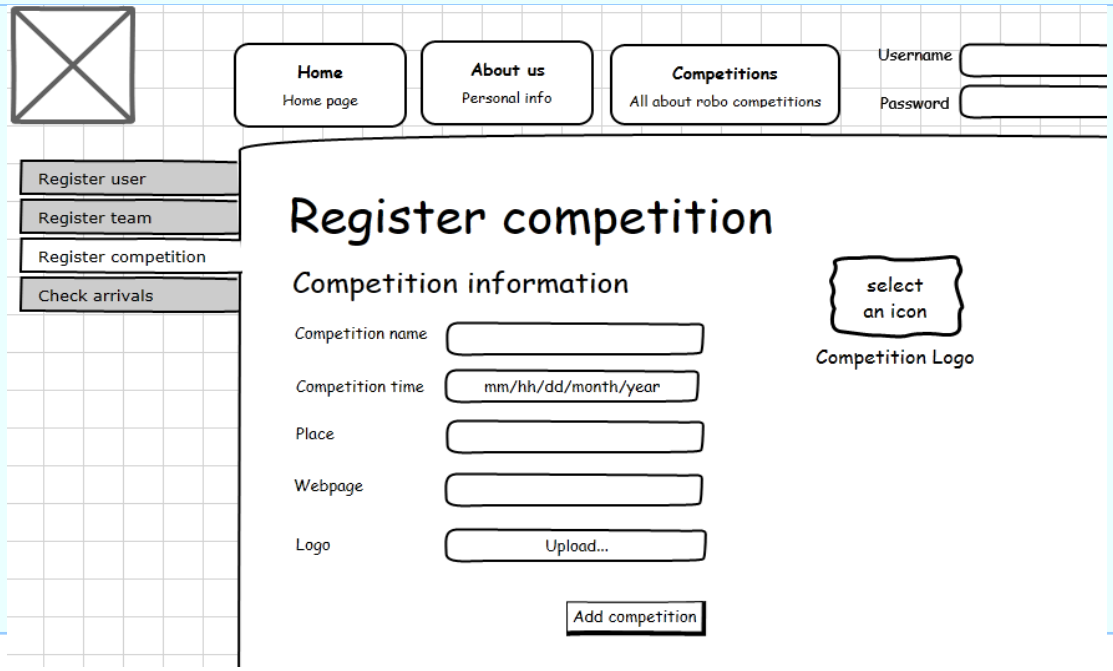
A detailed description of the scenario steps

Step 1: Display competition creating form
To create a competition the competition manager need to navigate to the competition creating form.

Step 2: Fill the form with necessary information
In this form the competition manager need to enter general information about the competition.

Step 3: Click the „save" button
After the competition manager has entered all the necessary information about the competition he will click the "save" button which then saves the competition to the system.

Schematic illustration of scenario



3.2.1.2 Scenario: Update general info

Use Case Scenarios: Competition management

Scenario: Update general info

To edit the existing general information about a competition we need to take the following steps:

Scenario steps:

1. Display the competition general information form
2. Edit the forms information
3. Click the “save” button

A detailed description of the scenario steps

Step 1: Display the competition general information form

To edit the competitions general information we need to navigate to the competition general information form.

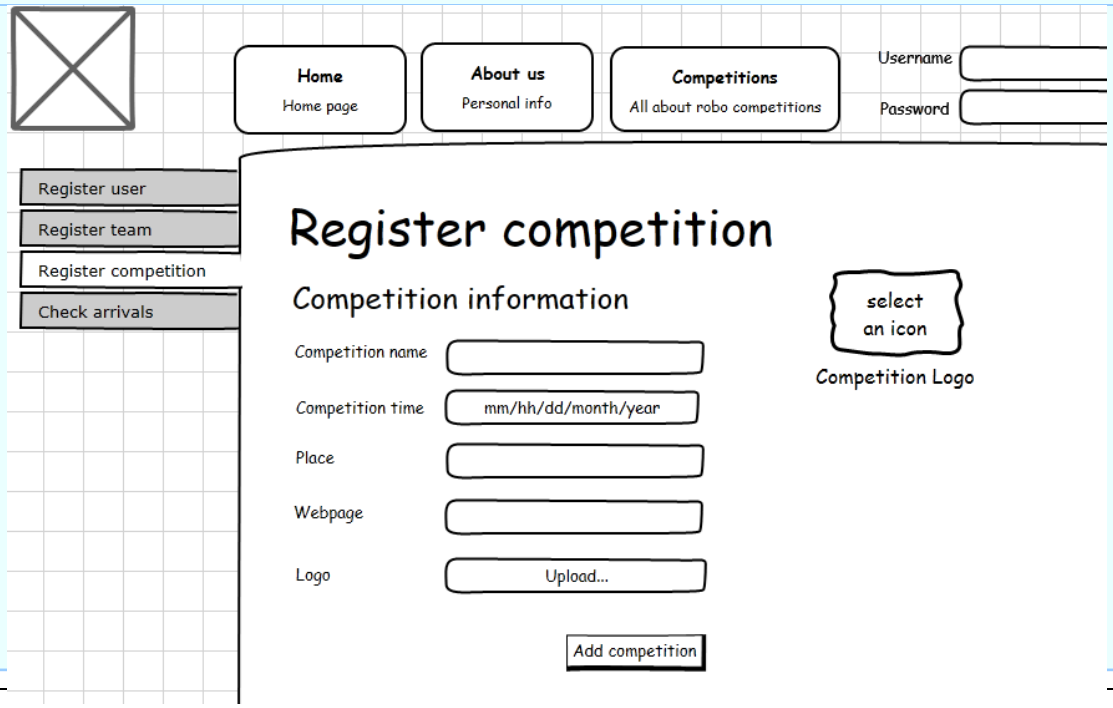
Step 2: Edit the forms information

On the form the competition manager needs to update the necessary fields.

Step 3: Click the „save“ button

After the competition manager has edited the necessary fields he will click the “save” button which will make the changes in the system.

Schematic illustration of scenario



3.2.1.3 Scenario: Update specific information

Use Case Scenarios: Competition management

Scenario: Update specific information

To edit the existing specific information about a competition we need to take the following steps:

Scenario steps:

1. Display the competition specific information form
2. Edit the forms information
3. Click the “save” button

A detailed description of the scenario steps

Step 1: Display the competition specific information form

To edit the competitions specific information we need to navigate to the competition specific information form.

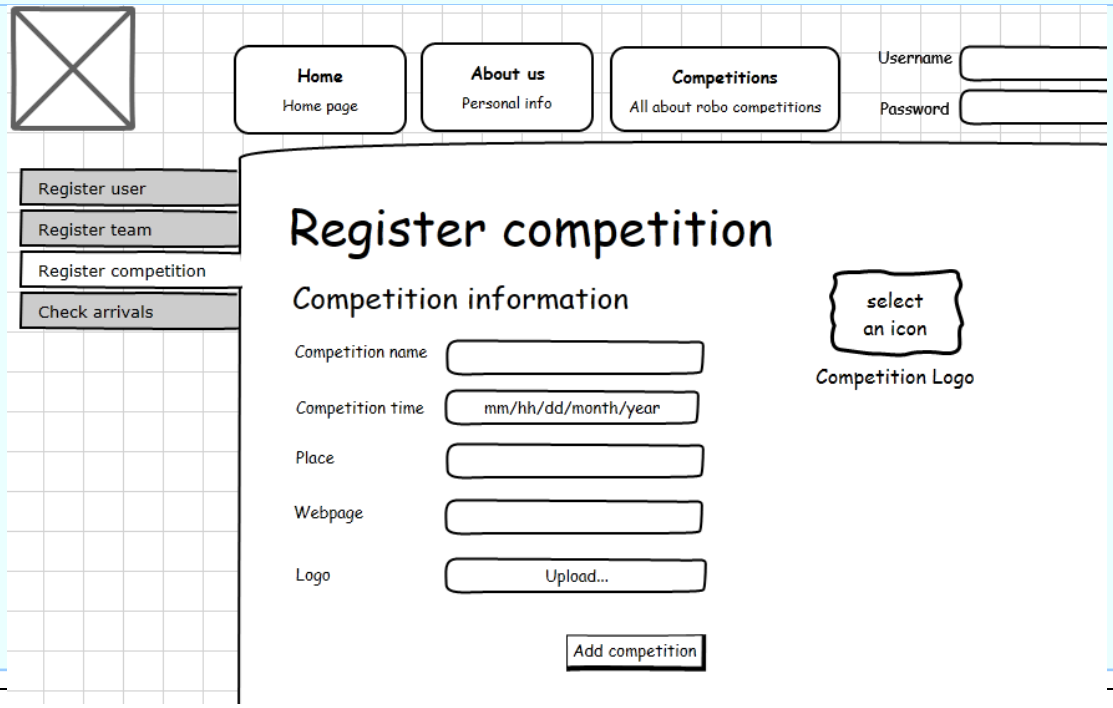
Step 2: Edit the forms information

On the form the competition manager needs to update the necessary fields.

Step 3: Click the „save“ button

After the competition manager has edited the necessary fields he will click the “save” button which will make the changes in the system.

Schematic illustration of scenario



3.2.1.4 Scenario: Update important dates

Use Case Scenarios: Competition management

Scenario: Update important dates

To edit the existing important dates about a competition we need to take the following steps:

Scenario steps:

1. Display the competition important dates form
2. Edit the forms information
3. Click the “save” button

A detailed description of the scenario steps

Step 1: Display the competition important dates form

To edit the competitions important dates we need to navigate to the competition important dates form.

Step 2: Edit the forms information

On the form the competition manager needs to update the necessary fields.

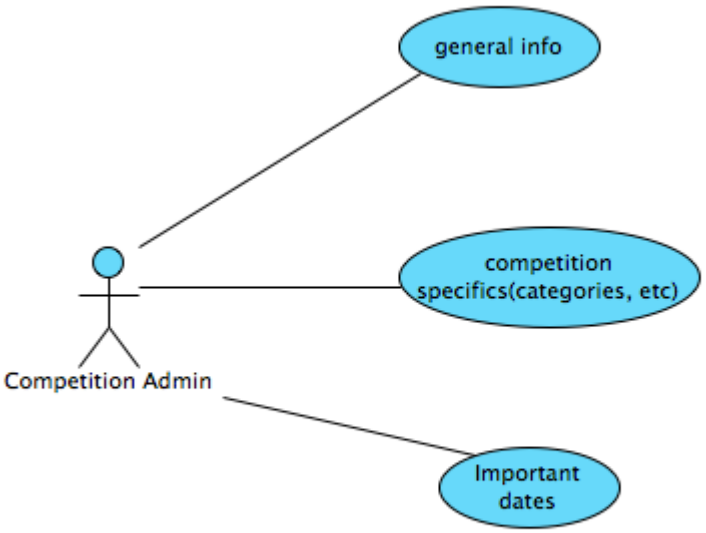
Step 3: Click the „save“ button

After the competition manager has edited the necessary fields he will click the “save” button which will make the changes in the system.

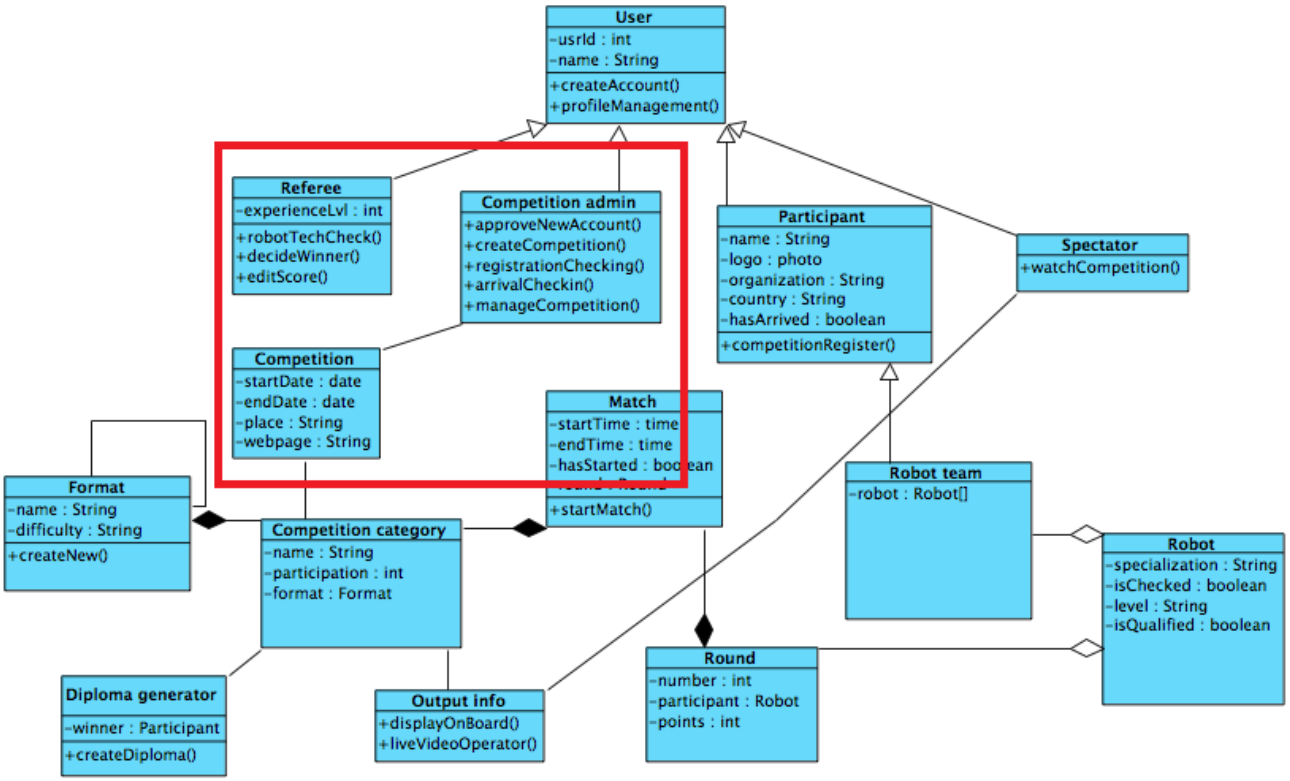
Schematic illustration of scenario

Background processes with no UI

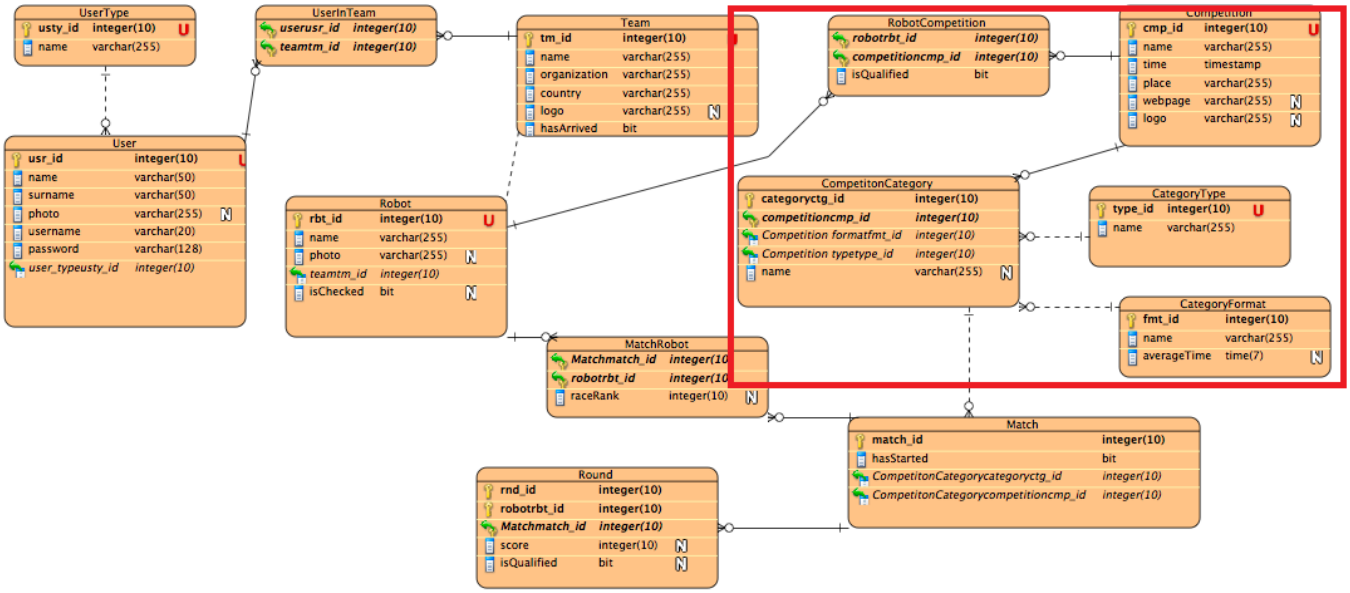
Use Case Diagram: Competition management



3.2.1 Class Diagram: Competition management



3.2.2 ERD Diagram: Competition management



3.3 Competition pre-registration Use Case Development

In this case we manage to figure out the pre competition tasks such as the validity of the participants, that have registered.

3.2.3 Competition pre-registration

Table 6 records use case: Competition pre – registration

Use Case Name: Competition pre - registration	**Importance Level: Intermediate**
Primary Actor: Administrator	**Use Case Type: Essential**
Stakeholders and Interests: *Administrator, Participants*	
Brief Description: *Within subscription and electronic presentation are performed the following actions: Participant registration and registration checking*	
Trigger: *Register new participant, check registration from admin*	
Relationships: Association : Includes : Create paricipation, Check, Validate Extends : Generalizaiton	
Normal Flow of Events: 1. Participant registration 2. Registration checking 3. Confirm registration	
Subflows: **SB2.**	
Alternate/Exceptional Flows:	

Table 6: Use Case Record Form: Competition pre - registration

3.1.1.7 Use Case Scenarios: Competition pre-registration

System: ROBOTEX	
User: Competition manager, participant	
Use case:. Competition pre-registration	
Scenario	**Actions**
Participant Registration	Display participant registration form
	Fill the form with the teams information
	Click the “save” button
Registration Checking	Display the registration checking form
	Check the necessary information

3.2.1.1 Scenario: Participant registration

Use Case Scenarios: Competition pre-registration

Scenario: Participant registration

To create a competition and distinguish it from other competitions, time and place, we need to create a new competition in the system. To create a new competition we need to take the following steps:

Scenario steps:

1. Display competition creating form
2. Fill the form with necessary information
3. Click the "save" button

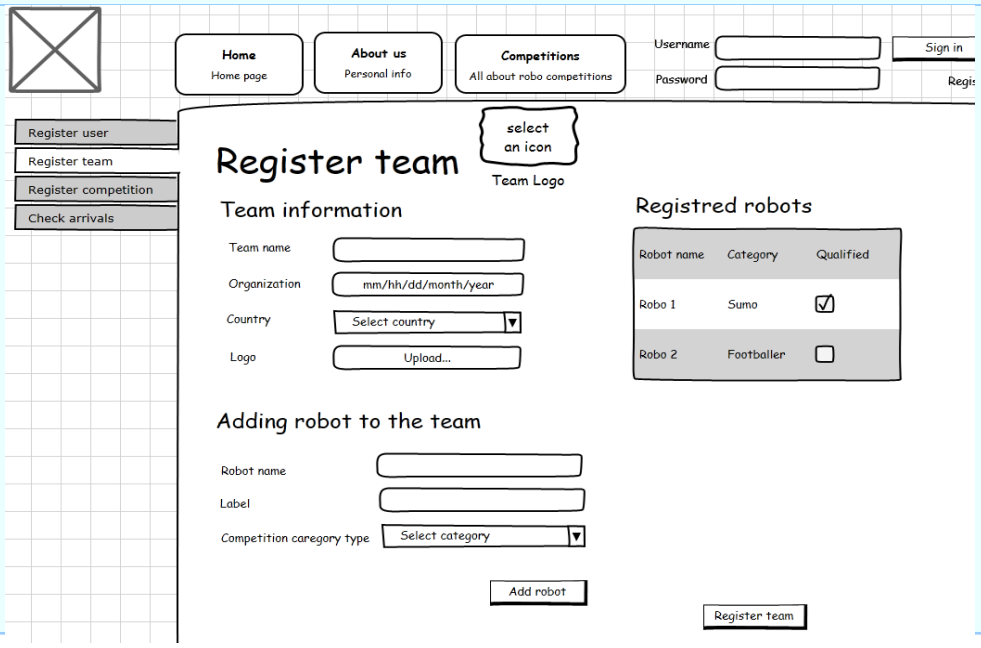
A detailed description of the scenario steps

Step 1: Display competition creating form
To create a competition the competition manager need to navigate to the competition creating form.

Step 2: Fill the form with necessary information
In this form the competition manager need to enter general information about the competition.

Step 3: Click the „save" button
After the competition manager has entered all the necessary information about the competition he will click the "save" button which then saves the competition to the system.

Schematic illustration of scenario



3.2.1.2 Scenario: Registration checking

Use Case Scenarios: Competition pre-registration

Scenario: Registration checking

To edit the existing general information about a competition we need to take the following steps:

Scenario steps:

1. Display the competition general information form
2. Edit the forms information
3. Click the “save” button

A detailed description of the scenario steps

Step 1: Display the competition general information form

To edit the competitions general information we need to navigate to the competition general information form.

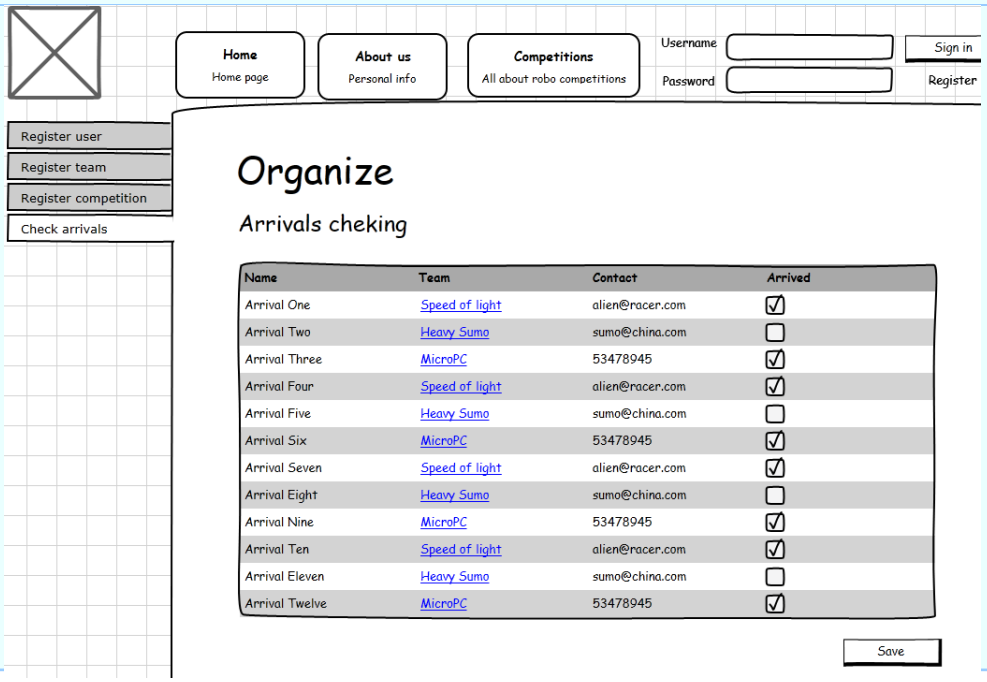
Step 2: Edit the forms information

On the form the competition manager needs to update the necessary fields.

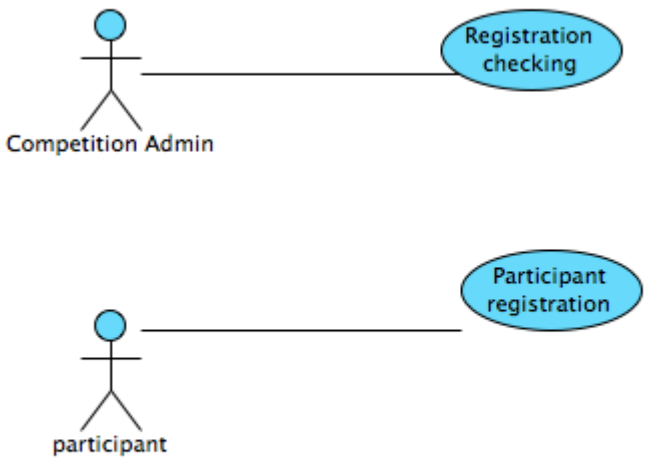
Step 3: Click the „save“ button

After the competition manager has edited the necessary fields he will click the “save” button which will make the changes in the system.

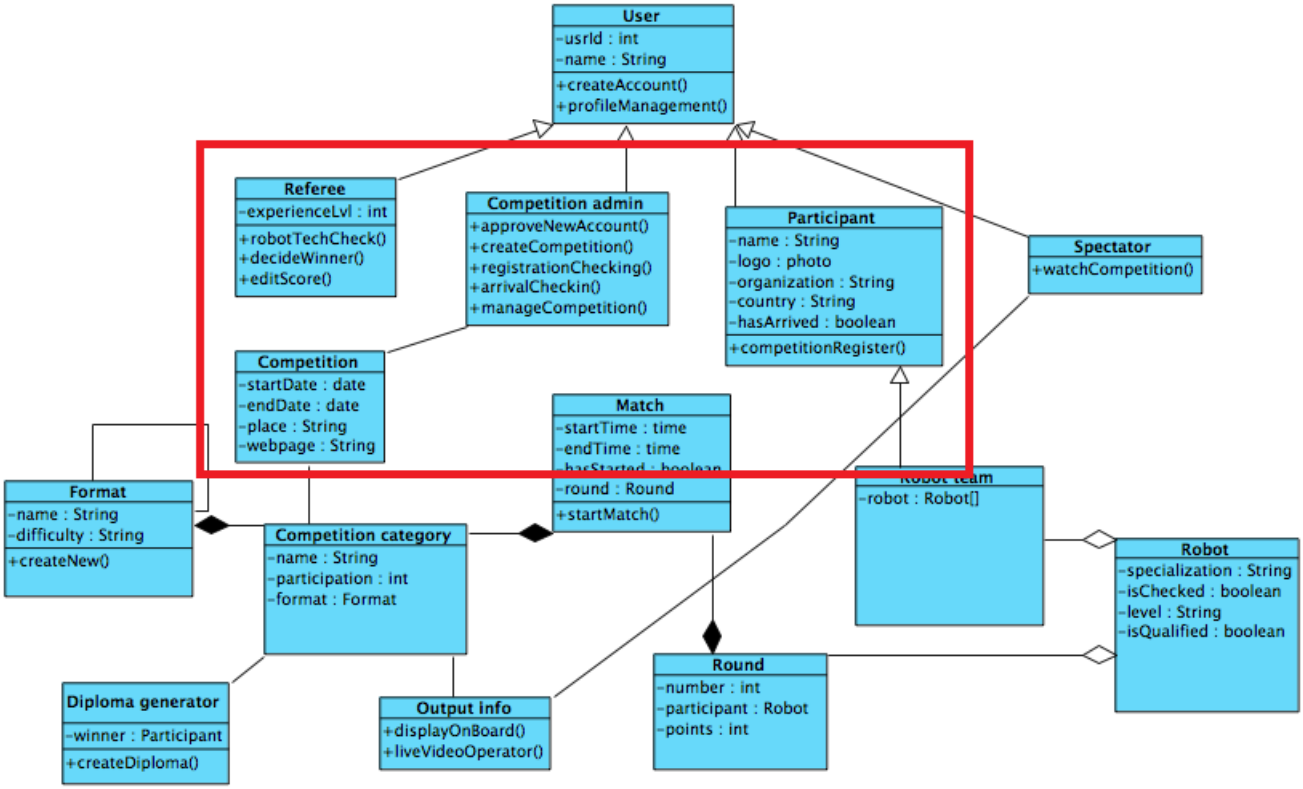
Schematic illustration of scenario



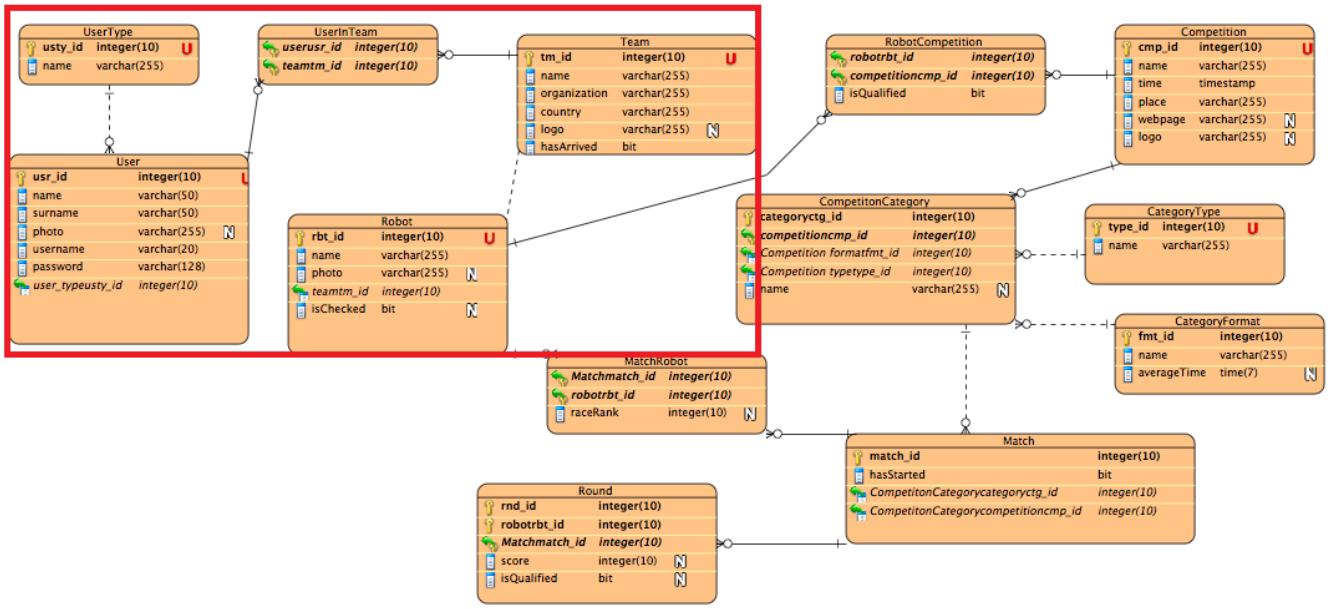
Use Case Diagram: Competition Pre-Register



3.2.4 Class Diagram: Competition Pre-Register



3.2.5 ERD Diagram: Competition Pre-Register



3.4 Competition check-in Use Case Development

In this section we will analyze the actions that take place at the competition day and the check –in actions, the robot technical check and the confirmation of each participant.

3.2.6 Competition check-in

Table 7 records use case: Competition check – in.

Use Case Name: Competition check in	**Importance Level: High**
Primary Actor: Administrator	**Use Case Type: Essential**
Stakeholders and Interests: *Administrator, Referee, Participants*	
Brief Description: *In this use case the organizers checks every participant in order to continue in competition.*	
Trigger: *Arrival check-in, Robot technical check, create competition schedule*	
Relationships: Association : Includes : Arrival check in, Robot technical check, confirm participation, create competition schedule. Extends : Generalizaiton	
Normal Flow of Events: 1. Arrival Check in 2. Robot check in 3. Confirm participation 4. Create competition schedule for each category 5. Update competition schedule for each category	
Subflows: **SB3.**	
Alternate/Exceptional Flows:	

Table 7: Use Case Record Form: Competition: Competition Check in

3.1.1.8 Use Case Scenarios: Competition check-in

System: ROBOTEX	
User: Competition manager, referee	
Use case:. Competition check-in	
Scenario	**Actions**
Arrival checking	Display arrival form
	Tick „arrived“ check-box for the participant
	Save data
Robot technical check	Display robot form
	Tick „robot checked“ check-box for the robot
	Save data
Create competition schedule	Display schedule form for the competition category
	Click the „create schedule“ button
Edit competition schedule	Display schedule form for the competition category
	Edit a matches participating team
	Save data

3.2.1.3 Scenario: Arrival checking

Use Case Scenarios: Competition check-in

Scenario: Arrival checking

To be enable the competition admin of Robotex to easily find the participant and mark him as arrived, the following steps will need to be taken:

Scenario steps:

1. Display arrival form
2. Tick “arrived” check-box for the participant
3. Save data

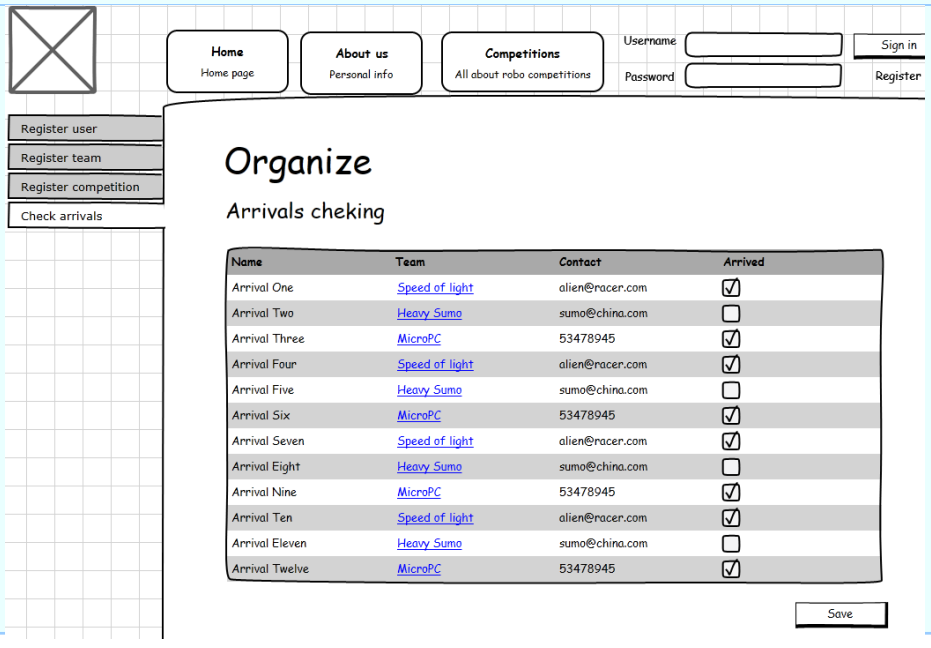
A detailed description of the scenario steps

Step 1: Display arrival form
Competition admin navigates to the arrival form.

Step 2: Tick “arrived” check-box for the participant
Competition admin uses search to search for the participants name from the list of participants. Upon finding the necessary participant the competition admin ticks the check-box.

Step 3: Save data
Upon ticking the box the participants data will be automatically updated.

Schematic illustration of scenario



3.2.1.4 Scenario: Robot technical check

Use Case Scenarios: Competition check-in

Scenario: Robot technical check

After a team has arrived, and also they´re robots, we will have to check their robots to see if they are technically compliant. To mark a robot technically compliant, we will have to take the following steps:

Scenario steps:

1. Display robot form
2. Tick „robot checked“ check-box for the robot
3. Save data

A detailed description of the scenario steps

Step 1: Display robot form
The referee that inspected the robot will navigate to the list of robots.

Step 2: Tick “robot checked” check-box for the robot
Competition admin uses the search function to find the robot he needs and ticks the “checked” box. If necessary the referee could also add a comment.

Step 3: Save data
Upon ticking the box the robots data will be automatically updated.

Schematic illustration of scenario

Background processes with no UI

3.2.1.5 Scenario: Create competition schedule

Use Case Scenarios: Competition check-in

Scenario: Create competition schedule

After all the teams have arrived or if it´s time to start the competition, then we need the system to generate a schedule. For the system to create the schedule, we need to take the following steps:

Scenario steps:

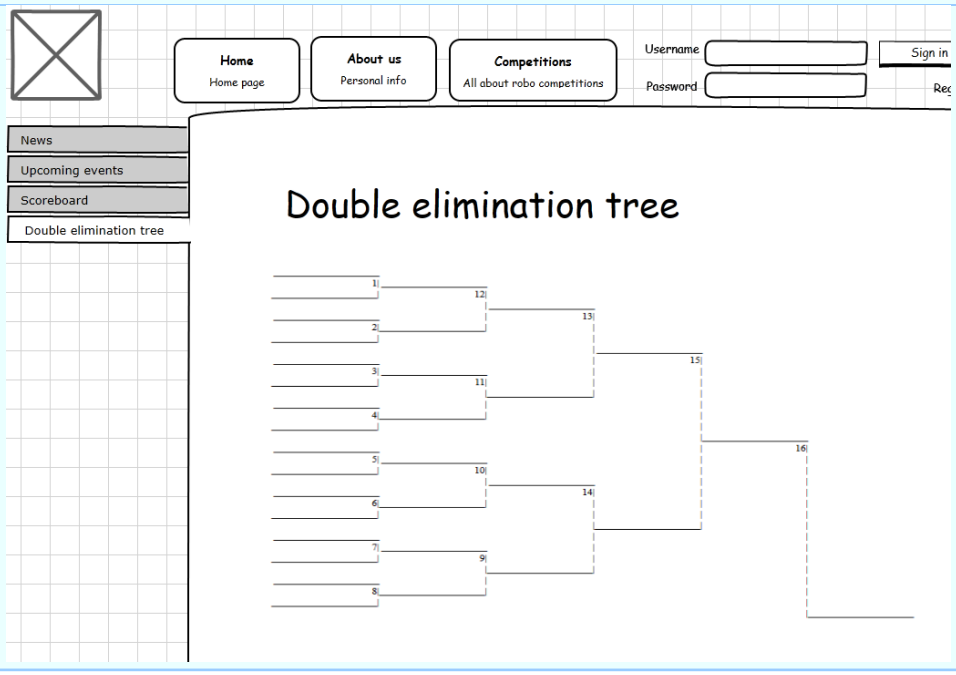
1. Display scedule form for the competition category
2. Click the „create schedule“ button

A detailed description of the scenario steps

Step 1: Display scedule form for the competition
Competition admin navigates to the one of the competition category´s schedule form.

Step 2: Click the „create schedule“ button
On the schedule form the competition admin clicks the “create schedule” button. After the click the system will generate a schedule.

Schematic illustration of scenario



3.2.1.6 Scenario: Edit competition schedule

Use Case Scenarios: Competition check-in

Scenario: Edit competition schedule

After automatically creating a schedule for the competition category, the competition admin can make changes to the schedule. To make changes to the schedule we take the following steps:

Scenario steps:

1. Display schedule form for the competition category
2. Edit a matches participating team
3. Save data

A detailed description of the scenario steps

Step 1: Display schedule form for the competition category

The competition admin navigates to the schedule form of the desired competition category.

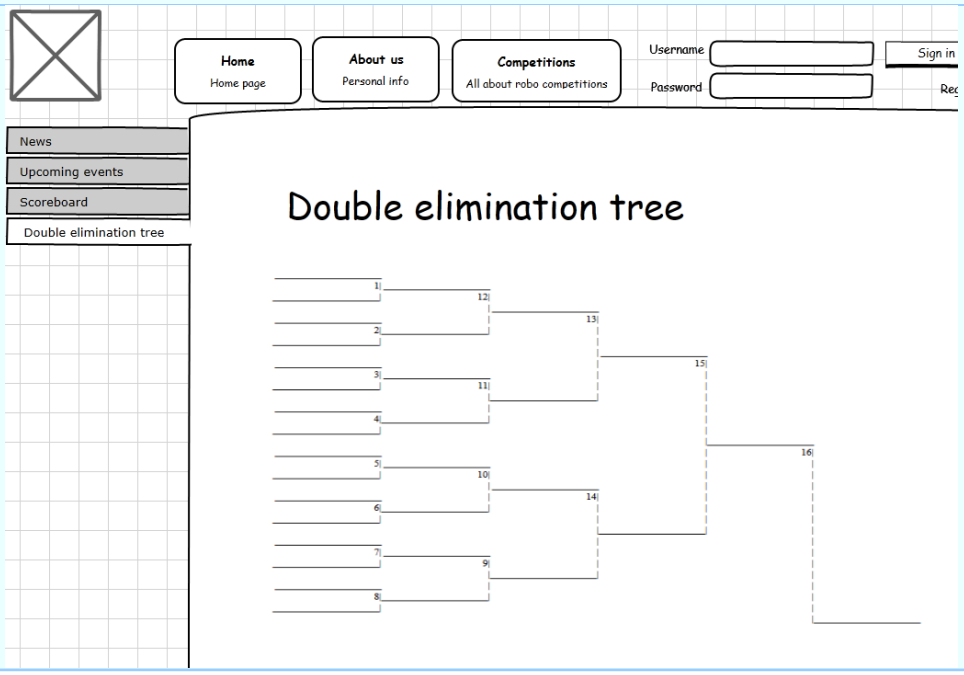
Step 2: Edit a matches participating team

The competition admin picks another team to play in a certain match. Upon picking the desired team, it will then change places with the previous team.

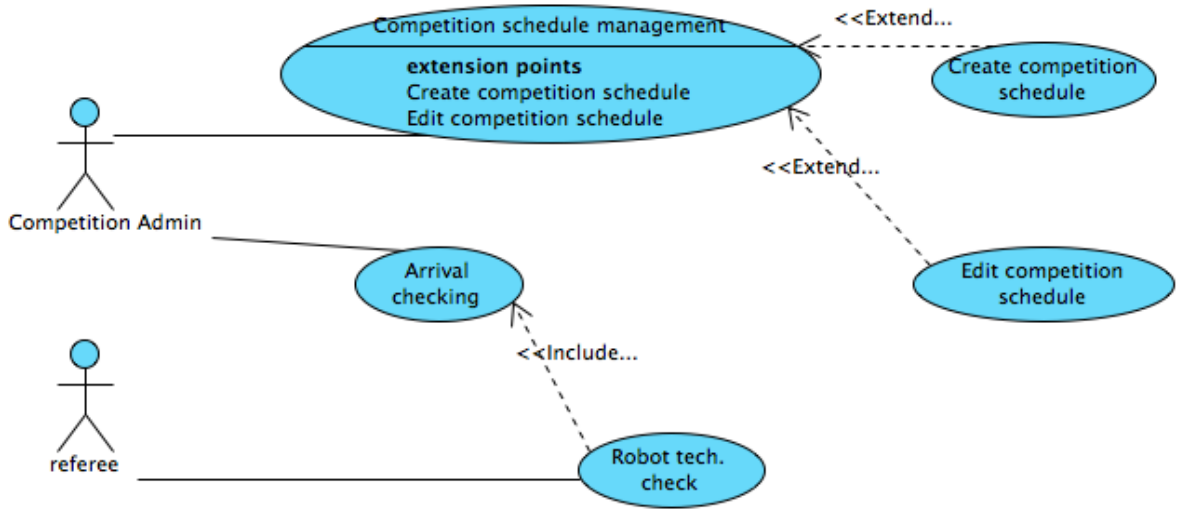
Step 3: Save data

After the necessary changes have been made the competition admin clicks the save button. Upon clicking the button all of the changes will be implemented.

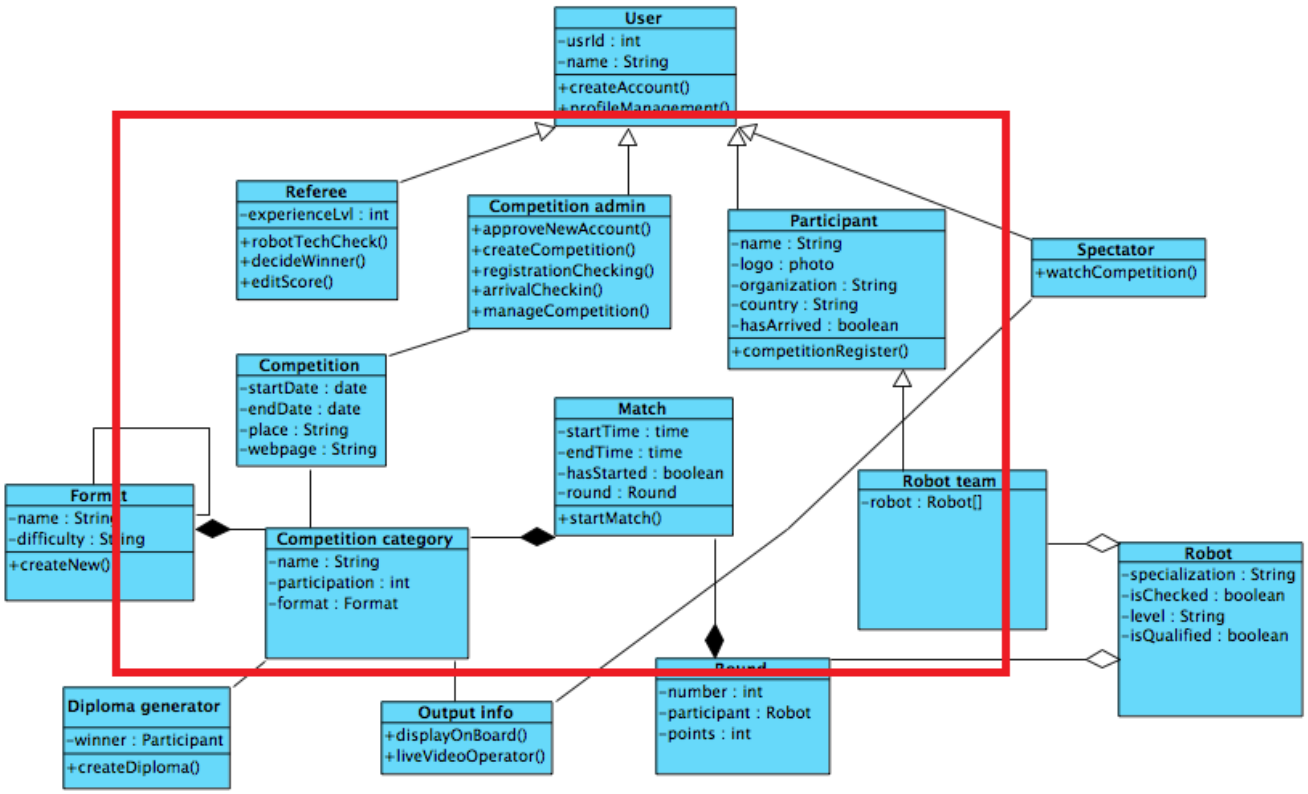
Schematic illustration of scenario



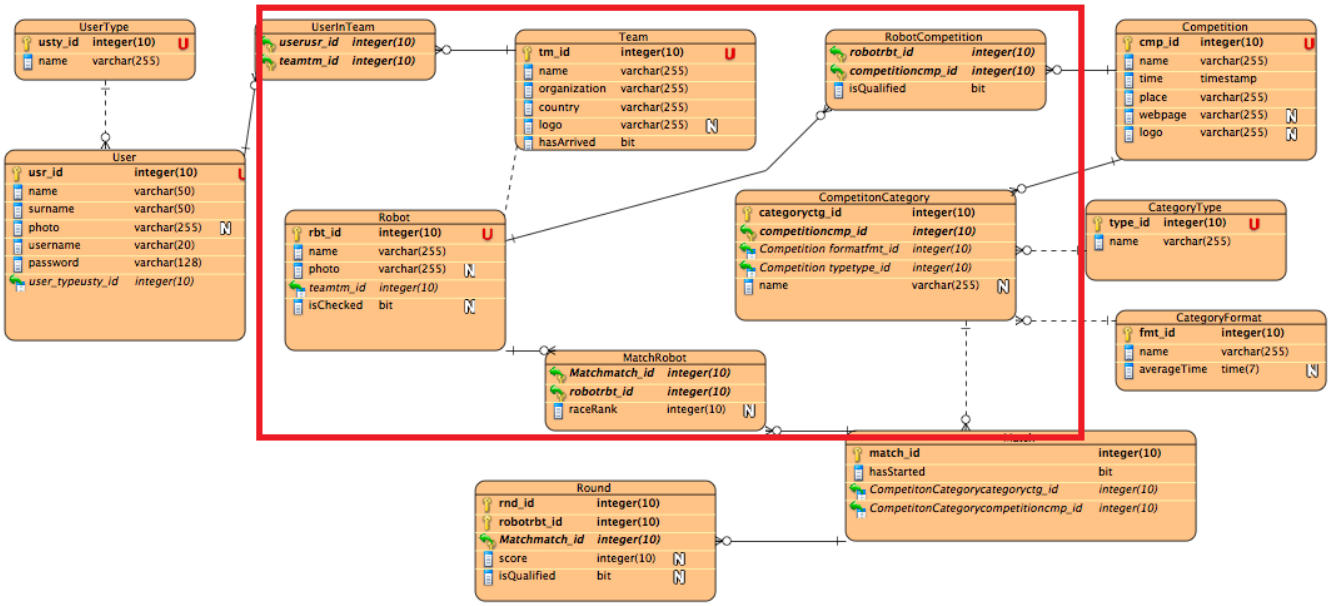
Use Case Diagram: Competition check-in



3.2.7 Class Diagram: Competition check-in



3.2.8 ERD Diagram: Competition check-in



Competition ongoing Use Case Development

In this section we will analyze the competition day and what use cases and actions take place in there.

3.2.9 Competition ongoing

Table 8 records use case: Competition ongoing.

Use Case Name: Competition ongoing	**Importance Level: High**
Primary Actor: Admin	**Use Case Type: Essential**
Stakeholders and Interests: *Admin, Referees, Participants, Spectators*	
Brief Description: *In this use case there are taking place the following actions:* Display the match editing form, Edit scores, decide winners, edit competition info	
Trigger: *Set up competition ongoing processes, edit match schedule, decide winners*	
Relationships: Association : Includes : Start match, edit score, Decide winner, Competition info. Extends : Generalizaiton	
Normal Flow of Events: 1. Start match 2. Edit Score 3. Decide Winners 4. Edit Competition info	
Subflows: **SB4.**	
Alternate/Exceptional Flows:	

Table 8: Use Case Record Form: Competition ongoing

3.1.1.9 Use Case Scenarios: Competition ongoing

System: ROBOTEX	
User: Competition manager, referee, participant, spectator	
Use case:. Competition ongoing	
Scenario	**Actions**
Start/Stop match	Display the match editing form
	Click the start/stop button
Edit score	Display the match editing form
	Edit the scores
	Click the “save” button
Decide winner	Display the match editing form
	Choose the winner
	Click the “save” button
Competition Info	Load display template
	Read data from Database
	Pass data on to display template

3.2.1.7 Scenario: Start/Stop match

Use Case Scenarios: Competition ongoing

Scenario: Start/Stop match

For the system to know if a match is active, we need to start that match. When a match is started, other parts of the system will know which information to display. To start a match we need to take the following steps:

Scenario steps:

1. Display the match editing form
2. Click the start/stop button

A detailed description of the scenario steps

Step 1: Display the match editing form
Competition admin navigates to the match editing form.

Step 2: Click the start/stop button
Competition admin click the start button to start the match. After the button click the match is marked as active and its information will be output onto spectator screens.
*The stop button is the opposite of the start, it will stop the match. Stopping the match will mark it inactive.

Schematic illustration of scenario

Background processes with no UI

3.2.1.8 Scenario: Edit score

Use Case Scenarios: Competition ongoing

Scenario: Edit score

To know who has the lead in the match, or how much score someone has at any given time, we need to save the score into our system. To save/edit score we need to take the following steps.:

Scenario steps:

1. Display the match editing form
2. Edit the scores
3. Click the "save" button

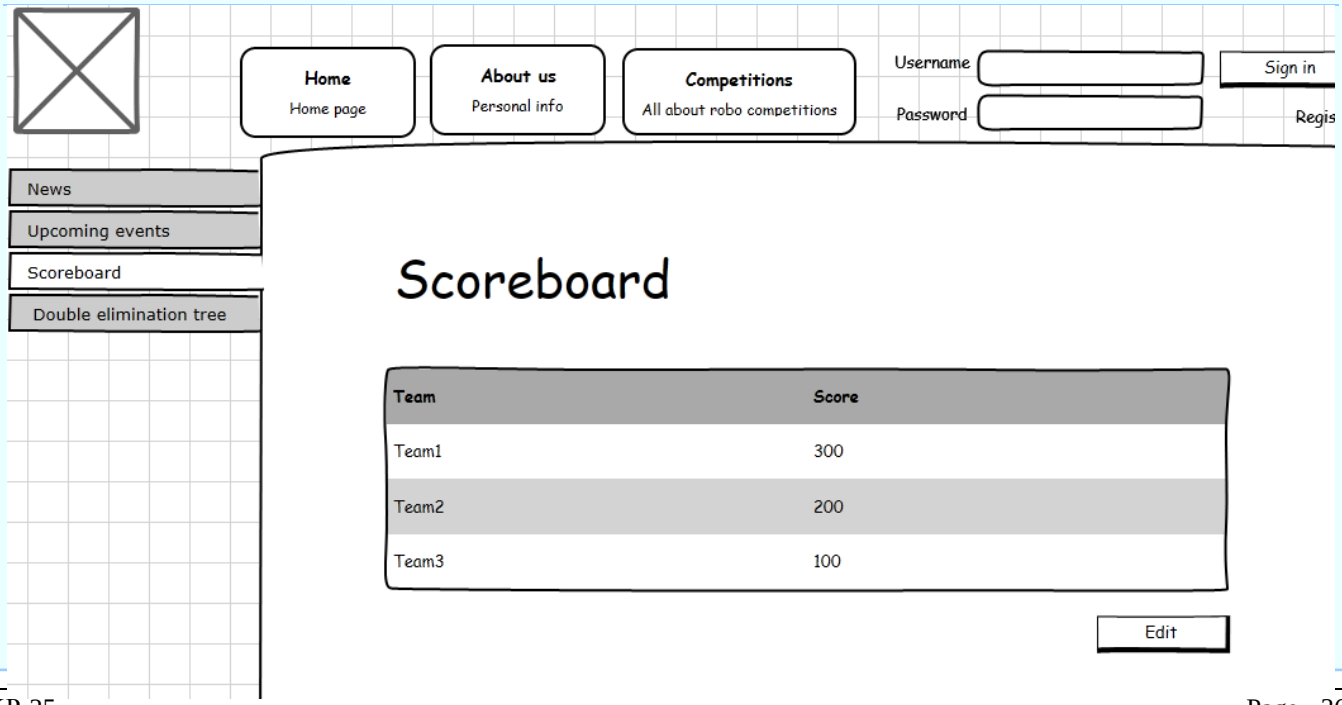
A detailed description of the scenario steps

Step 1: Display the match editing form
The competition manager navigates to the match editing form.

Step 2: Edit the scores
Competition manager then enters the score for a robot, or for many robots. The score could also hold time value in seconds for the line following competition.

Step 3: Click the "save" button
After entering the score for the robots the competition manager need to click the save button after which the system saves the scores to the database.

Schematic illustration of scenario



3.2.1.9 Scenario: Decide winner

Use Case Scenarios: Competition ongoing

Scenario: Decide winner

After the match has finished the referee picks the winner, this is because more score does not always indicate a winner there are exceptions. To pick a winner the referee needs to take the following steps:

Scenario steps:

1. Display the match editing form
2. Choose the winner
3. Click the “save” button

A detailed description of the scenario steps

Step 1: Display the match editing form
The competition manager navigates to the match editing form.

Step 2: Choose the winner
On the match editing form the referee can pick a the finishing rank for the robot or a winner, if there are only 2 robots.

Step 3: Click the “save” button
After picking a rank for all of the robots the referee clicks the save button after which the information gets saved into the system and the necessary actions will be taken.

Schematic illustration of scenario

Background processes with no UI

3.2.1.10 Scenario: Competition info

Use Case Scenarios: Competition ongoing

Scenario: Competition info

To view the current state of the competition we need to have an output. To access the output, a user needs to take the following steps:

Scenario steps:

1. Load display template
2. Read data from database
3. Pass data on to display template

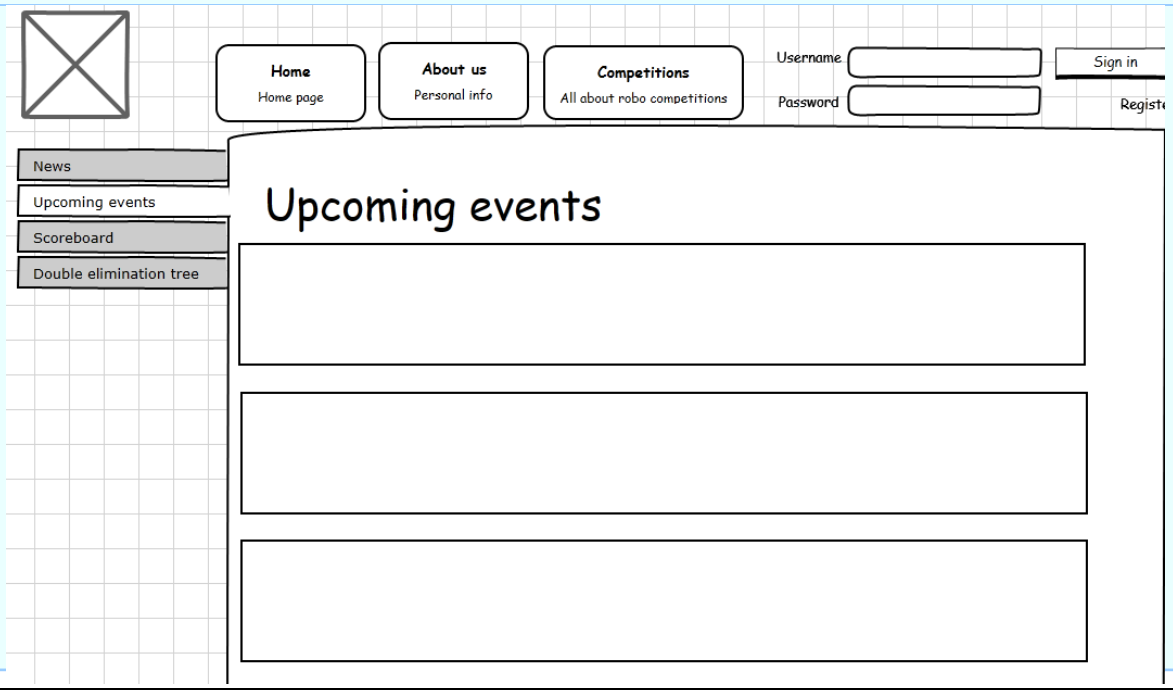
A detailed description of the scenario steps

Step 1: Load display template
The administrator must load a template to fill it with information such as categories, matches, participants etc.

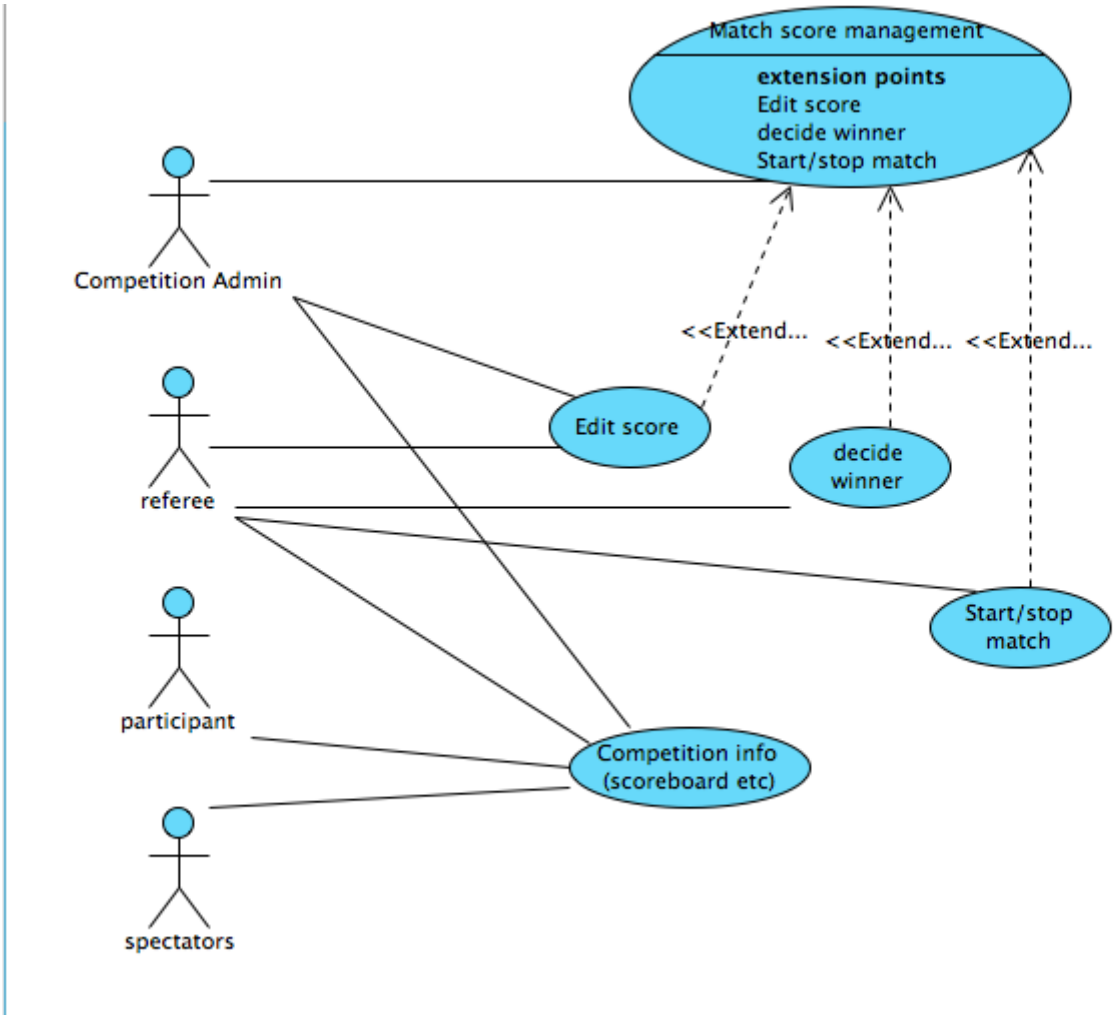
Step 2: Read data from database
At this phase some data should be read from the database, that have a relationship with the competition info such as robot names teams, specialization etc.

Step 3: Pass data on to display template
After database reading the system fills the display template

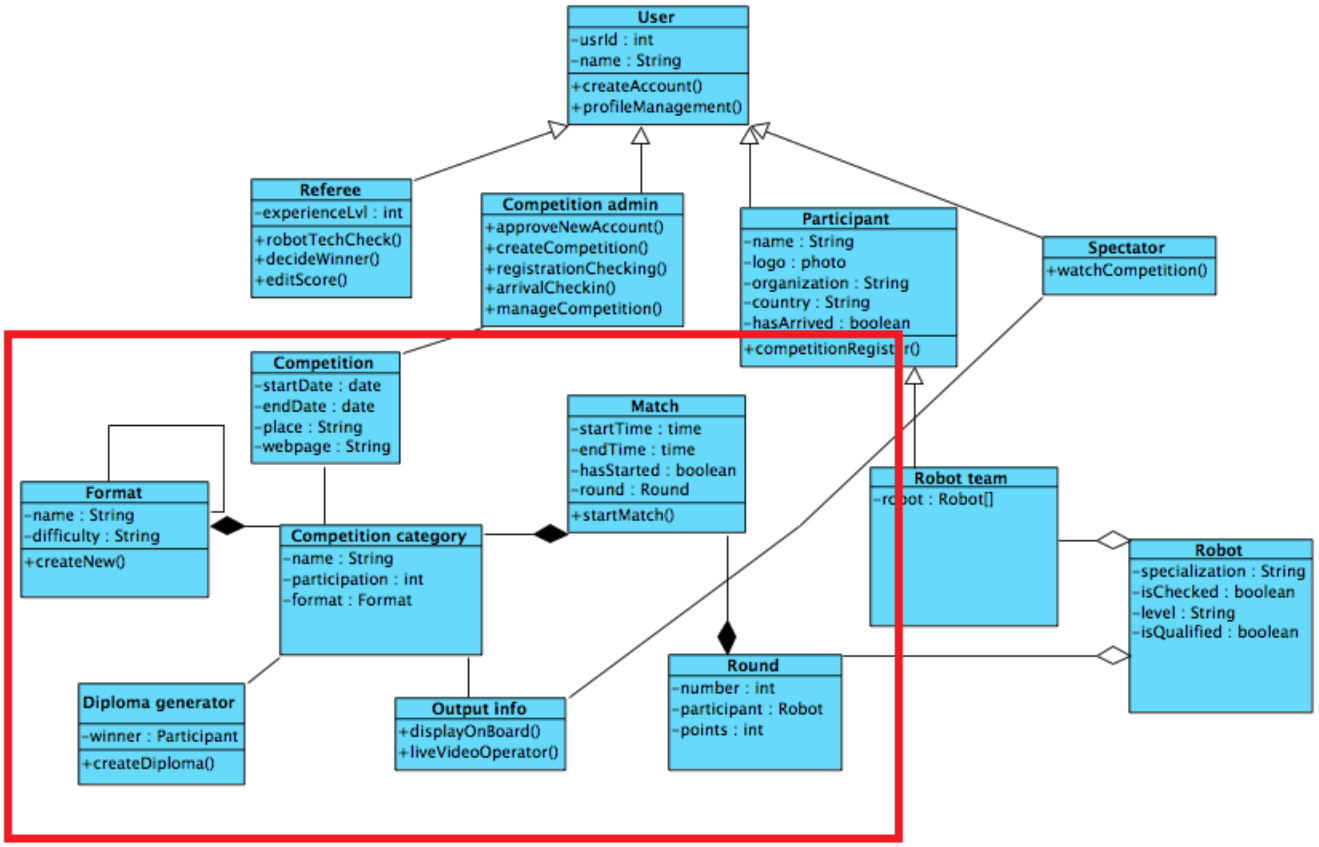
Schematic illustration of scenario



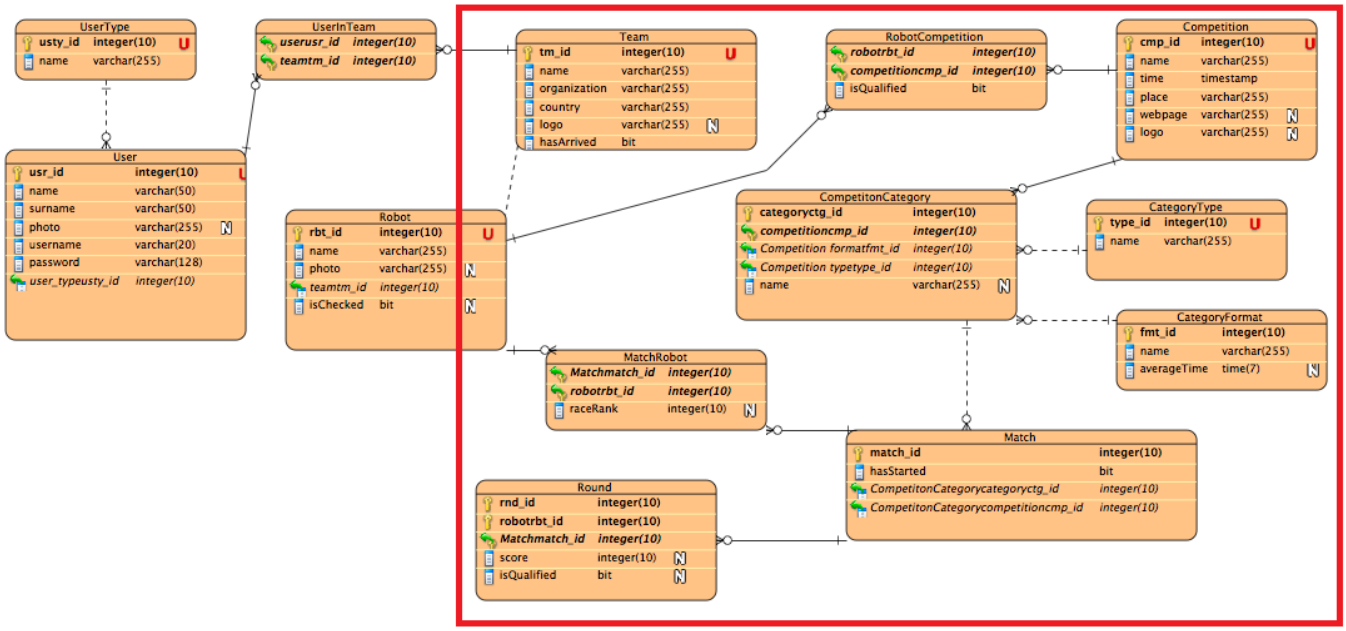
Use Case Diagram: Competition ongoing



3.2.10 Class Diagram: Competition ongoing



3.2.11 ERD Diagram: Competition ongoing



3.5 Competition ending Use Case Development

In this section we analyse the processes taking place at the end of the competition.

3.2.12 Competition ending

Table 9 record use case Competition Ending

Use Case Name: Competition Ending	**Importance Level: Low**
Primary Actor: Admin	**Use Case Type: Essential**
Stakeholders and Interests: *Admin, Winner*	
Brief Description: *In this section the competition ends and the use case that takes place is the diploma generator*	
Trigger: *locate winners , generate diplomas*	
Relationships: Association : Includes : Diploma generator Extends : Generalizaiton	
Normal Flow of Events: 1. Locate winners 2. Generate diplomas	
Subflows: **SB5.**	
Alternate/Exceptional Flows:	

Table 9: Use Case Record Form: Competition ending

3.1.1.10 Use Case Scenarios: Competition ending

System: ROBOTEX	
User: Competition manager	
Use case:. Competition ending	
Scenario	**Actions**
Diploma generation	Load winners from DB
	Display diploma generation form
	Click „generate“ button

3.2.1.11 Scenario: Diploma generation

Use Case Scenarios: Competition ending

Scenario: Diploma generation

To easily generate diplomas based on system information about the winning participants you need to take the following steps:

Scenario steps:

1. Load winners from DB
2. Display diploma generation form
3. Click „generate“ button

A detailed description of the scenario steps

Step 1: Load winners from DB
Competition admin loads some queries in to DB to locate the winners.

Step 2: Display diploma generation form
Competition admin navigates to the diploma generation form.

Step 2: Click „generate“ button
Competition admin clicks the “generate” button and the output will be generated for all the winners.

Schematic illustration of scenario


SAMPLE CERTIFICATE OF COMPLETION

Certificate of Completion

This certifies that

[LICENSEE NAME*] [CPA CERTIFICATE NUMBER]

has met the standards required for completion of

[COURSE/PROGRAM TITLE*]

[DATE*]

and has been awarded ____ hours of Continuing Professional Education Credit*

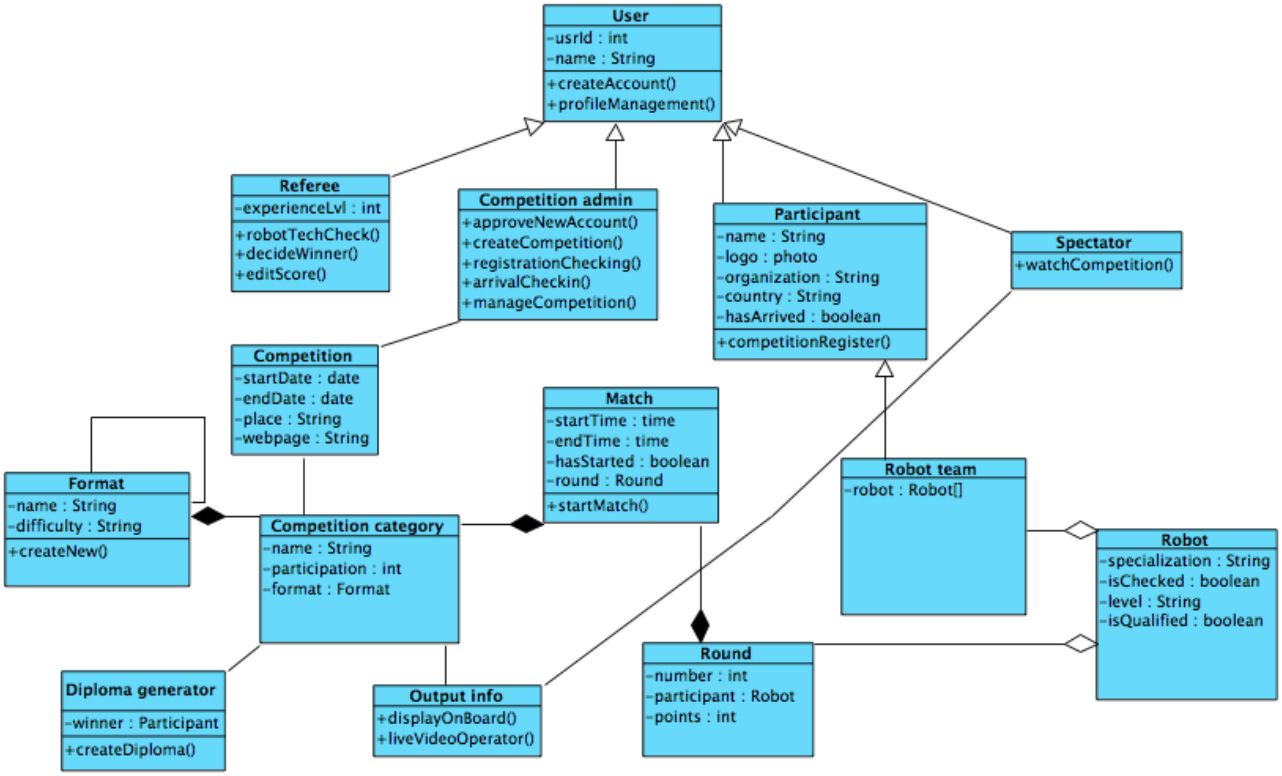
[SPONSOR NAME*]
[SPONSOR NUMBER*]
[ADDRESS*]
[TELEPHONE NUMBER*]

Authorized Signature

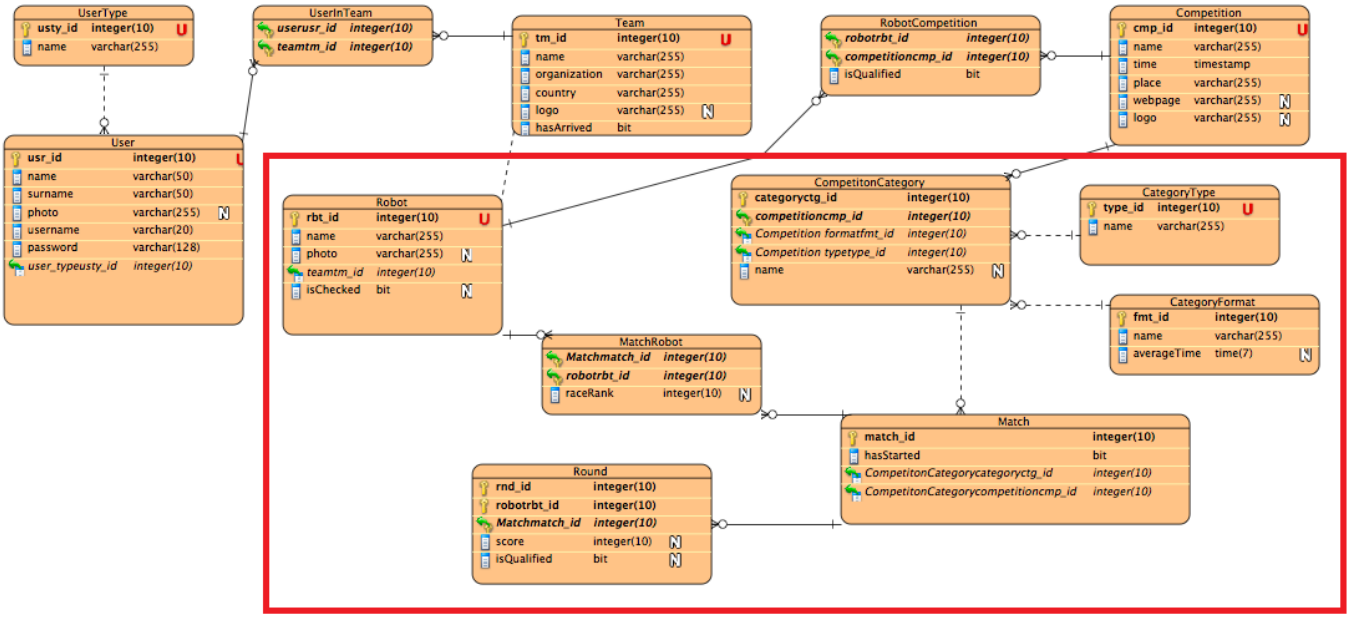
*THESE ITEMS MUST APPEAR ON THE COMPLETION CERTIFICATE.

Use Case Diagram: Competition ending

3.2.13 Class Diagram: Competition ending



3.2.14 ERD Diagram: Competition ending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country varchar(255)
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hasArrived bit
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Round
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robotrbt_id integer(10)
Matchmatch_id integer(10)
score integer(10) N
isQualified bit N

3 References

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