INFORMATIONS SYSTEMS

Connect Sports

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Summary

1. Context

1.1. About the company

Fantasy Sport SW is a company with 10-year experience in mobile and web development, with offices in Montreal, Sao Paulo and Rio de Janeiro. It has a team of 50 developers with experience in HTML, CSS, Java, PHP, React, Agile methodologies, and for this project, it also counts with the help of 5 professionals specialized in the niche sports.

The founders of the company have deep ties to niche sports, which gives the company an edge on the sports landscape.

1.2. Daily Fantasy Sports (DFS)

Daily Fantasy Sports are a subset of fantasy sport games. As with traditional fantasy sports games, players compete against others by building a team of professional athletes from a particular league or competition while remaining under a salary cap, and earn points based on the actual statistical performance of the players in real-world competitions. Daily fantasy sports are an accelerated variant of traditional fantasy sports that are conducted over short-term periods, such as a week or single day of competition, as opposed to those that are played across an entire season. Daily fantasy sports are typically structured in the form of paid competitions typically referred to as a "contest"; winners receive a share of a predetermined pot funded by their entry fees. A portion of entry fee payments go to the provider as rake revenue.

2. Product

We are developing a new software focused on fantasy sports, in particular niche sports called Connect Sports.

2.1. What

Connect Sports is aimed to fill this gap and bring leagues and fans closer together. Our solution will bring the DFS concept to fans from sports that are considered niche (smaller fanbase), with lower financial potential. It will include stats information, forums and aggregate news on players, teams and leagues, becoming virtually a one-stop shop for sports fans. By creating an engaging product that appeals to fans from several sports in one place, we believe that we can rake in a relevant customer base that will be closer to the customer base of traditional sports DFS services. This will result in increased commercial opportunities for the company, as it might be possible to reach numbers that are closer to the big leagues and attract major brands.

The whole sport ecosystem might benefit as well, as DFS has been linked to the increase of sports consumption by the users. Athletes can improve their personal brand to help sign endorsements, leagues and teams can show sponsors how their fan base is engaging.

2.2. Why

Sports that typically are not so popular in their markets (think sports outside the big leagues in the US - NFL, NBA, MLB, NHL and MLS - Canada - NHL, CFL, MLS - or and major european and brazilian football leagues) experience difficulty in getting their games broadcast, streamed or even get any media coverage, and that directly impacts its fan base who is unable to find unbiased, specialized information about their teams, interact with other fans and and have fun. Additionally, sports lack a platform that can help them showcase their product and reach a wider audience.

2.3. How

- By developing a Fantasy Sports app, which uses gamification features targeted mainly to the 18-34 year-old demographic, the most coveted by leagues, brands and advertisers alike. It allows fans to create their teams or pick their favorite players and guess the results of upcoming matches.

- By providing in-depth coverage that helps fans stay up-to-date to their favorite teams and also make better decisions when choosing players and picking winners.

- By creating forums where fans can discuss, create polls and interact, spending more time on the platform.

2.4. Vision

For people who have the desire to connect to a larger community with shared interests and create a strong network to amplify their beloved sport while having fun in a unique way.

2.4.1. Long term vision

Empowers users and leagues by providing a place to exchange ideas and showcase their sport to a wider audience.

3. Feasibility Study

3.1. Total Addressable Market (TAM)

For the app's release, we will focus on the audiences for three sports that, according to the table below, have a large enough fanbase and practicants that would engage in the app. As they are all very different between them, it also allows to showcase the flexibility of the platform to support different sports.

Although Fantasy Sports are a well established concept and the intended audience is the already existing fanbase of selected sports, Connect Sports addresses a new market, as this potential user base is not currently supported by any solution.

In future updates, more sports could be added.

Sport	Estimated global fans (in millions)	Affiliated Nations	International Federation Revenue (in US$ Millions)
Rugby	100	128 Nations	432*
Judo	200	200 Nations	30*
Crossfit	50	120 Nations	4,000
TOTAL	350		4,460

There are no public studies available about the total addressable market on judo and Rugby. Because these sports are public (they are not a brand nor belong to a specific company, as opposed to Crossfit) it is harder to measure the market value for them. However, we believe that the revenue of their governing bodies, as well as their global presence and number of registered players are a good indicator of the potential revenue around it.

3.2. Budget

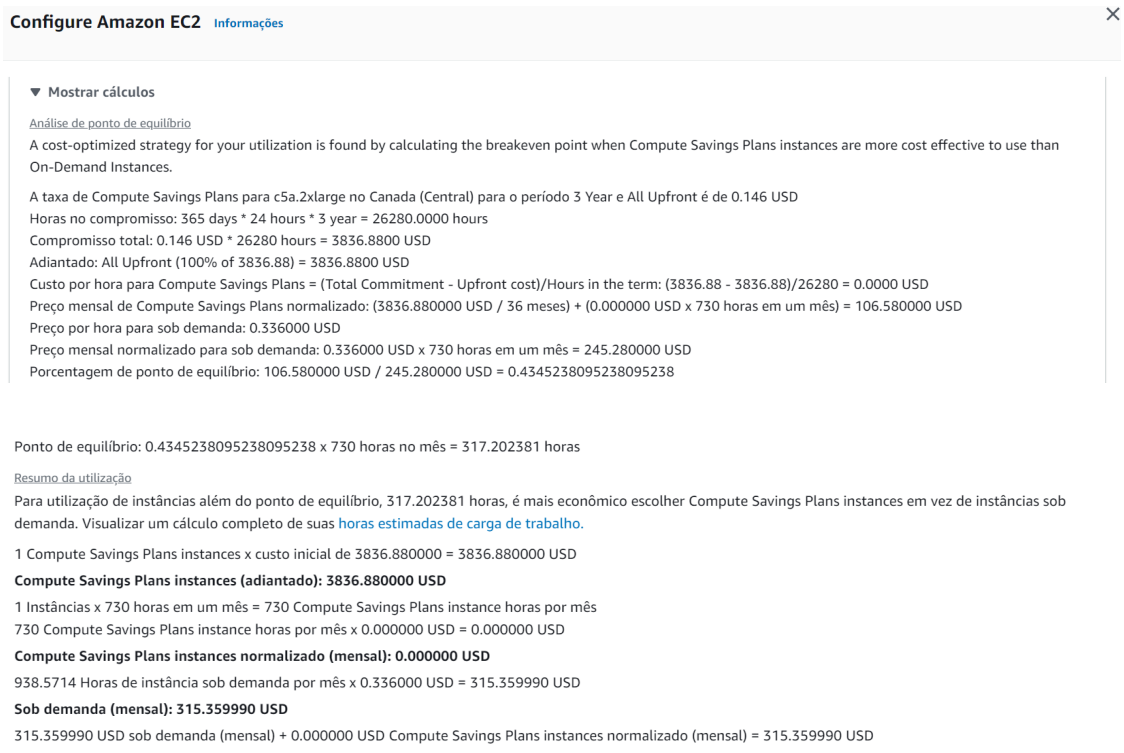
3.2.1. Cost Considerations:

Hardware

- We consider that 1% of the estimated fanbase (3.5 million fans) will sign up to the app.
- Furthermore, 20% of the registered users (700 thousand) will be using the app regularly.
- At any given time, we expect that 20% of the regular users (140 thousand) will be logged in using the platform, reading news, picking their team and interacting on forums.

To support this amount of users without any bottlenecks or instability in the infrastructure we considered hiring Amazon EC2 for server and Amazon S3 for storage needs to support our application. It provides on demand services on the Amazon Cloud for both servers and storage needs.

Sporting events happen mostly during weekends, so a more robust solution will be required during this period. The setup we chose allows scalability during peak days and save resources during low demand periods.



Figures 1 and 2: Screenshots of AWS Calculator

Software

- There is no need for any software licenses, as all the programming languages are open source and tools are already being used in the company's other projects.

Development Schedule

The estimated project time was based on similar projects developed by the company in the past.

- The project will demand around 600 hours from each of the 10 team members to complete the project in 4 months. That will be in time for the beginning of the Rugby World Cup, which will take place in France, starting September 8th.
- Code maintenance will require 10% of the initial effort.
- The company's employees have all the technical expertise and tools to develop the Project.
- The team includes a project manager, junior and senior software developers, and a product owner, each one of them getting different salaries. For simplicity purposes, the hourly fees have been normalized to $30/hour.

Additional Costs

- Licenses to allow use of players names, images and likeness and team logos will cost around $30,000.00 in the first 3 years, and grow to $40,000.00 in the following years.
- To promote the platform on social media, podcasts and search ads, we are considering a $50,000.00 budget per year.

3.2.2. Benefit Considerations

3.2.2.1. Tangible

The app will adopt the "freemium" model. That means that it will be free to download and use some basic functionalities, but additional features will be accessible through a subscription, and it will be ad supported.

Below, there is a comparison table of features in both models:

Features	Freemium	Paid
Read News/Comment	✔️	✔️
Join Tournaments	✔️	✔️
Access to forums	✔️	✔️
Create custom tournaments	❌	✔️
Special content	❌	✔️
Create topics/communities	❌	✔️
Ad free	❌	✔️

Subscription

- The platform will have a monthly subscription plan which will cost $4.99 per month.
- We expect that 5% of the regular users (35 thousand) will subscribe to get access to the premium features in the first year.
- As the platform gets traction, we expect to reach 75 thousand subscribers by the sixth year

Ad Revenue

- Revenue from ads in-app and branded-content features will account for $100,000.00 in the first year and ramp up to $400,000.00 by the sixth year.

3.2.2.2. Intangible

- Provide niche sports and athletes with a platform that will give them more visibility in the media and might help get sponsors
- Increased sense of community by the users
- Fidelity from the fanbase towards the company

3.3. ROI Analysis

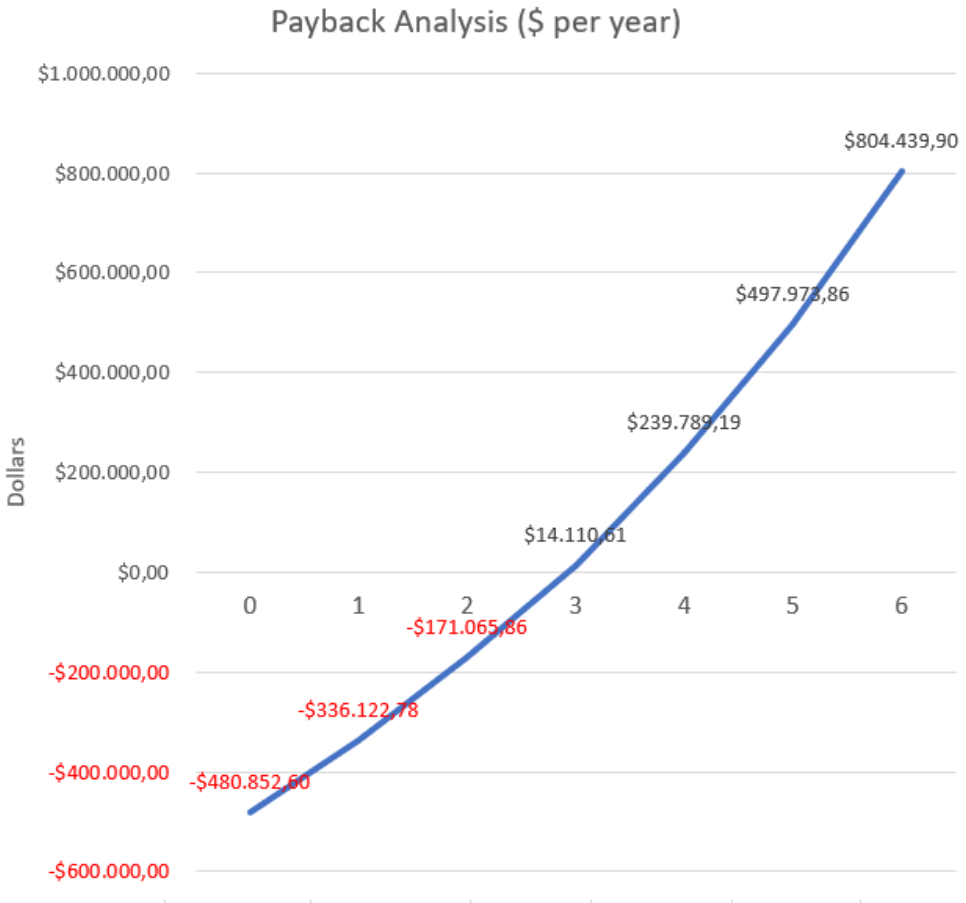
The table below represents all the topics detailed above and from those numbers, we are able to find the break-even point and the ROI for the project.

Year	0	1	2	3	4	5	6
Costs	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Amazon EC2 (Server)	$ 3.836,88	$ 3.836,88	$ 3.836,88	$ 5.674,67	$ 5.674,67	$ 5.674,67	$ 5.674,67
Amazon S3 (Storage)	$ 1.665,72	$ 1.665,72	$ 1.665,72	$ 1.665,72	$ 1.665,72	$ 1.665,72	$ 1.665,72
Development	$ 720.000,00	$ 72.000,00	$ 72.000,00	$ 72.000,00	$ 72.000,00	$ 72.000,00	$ 72.000,00
License fees	$ 30.000,00	$ 30.000,00	$ 30.000,00	$ 40.000,00	$ 40.000,00	$ 40.000,00	$ 40.000,00
Marketing	$ 50.000,00	$ 50.000,00	$ 50.000,00	$ 50.000,00	$ 50.000,00	$ 50.000,00	$ 50.000,00
Discount (12%)	$ 1,0000	$ 0,8929	$ 0,7972	$ 0,7118	$ 0,6355	$ 0,5674	$ 0,5066
Time-adjusted costs	$ 805.502,60	$ 140.627,32	$ 125.560,11	$ 120.533,14	$ 107.618,88	$ 96.088,29	$ 85.793,11
Cumulative time-adjusted costs	$ 755.502,60	$ 896.129,92	$ 1.021.690,03	$ 1.142.223,17	$ 1.249.842,05	$ 1.345.930,34	$ 1.431.723,45
Benefits	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Subscription ($4.99)	$ 174.650,00	$ 199.600,00	$ 224.550,00	$ 249.500,00	$ 274.450,00	$ 324.350,00	$ 374.250,00
Ad Revenue	$ 100.000,00	$ 120.000,00	$ 140.000,00	$ 180.000,00	$ 250.000,00	$ 300.000,00	$ 400.000,00
Total Benefit	$ 274.650,00	$ 319.600,00	$ 364.550,00	$ 429.500,00	$ 524.450,00	$ 624.350,00	$ 774.250,00
Discount (12%)	$ 1,0000	$ 0,8929	$ 0,7972	$ 0,7118	$ 0,6355	$ 0,5674	$ 0,5066
Time-adjusted benefits	$ 274.650,00	$ 285.357,14	$ 290.617,03	$ 305.709,62	$ 333.297,46	$ 354.272,96	$ 392.259,15
Cumulative time-adjusted benefits	$ 274.650,00	$ 560.007,14	$ 850.624,17	$ 1.156.333,79	$ 1.489.631,24	$ 1.843.904,20	$ 2.236.163,35
Year	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
NPV (Cumulative lifetime time-adjusted costs)	-$480.852,60	-$336.122,78	-$171.065,86	$14.110,61	$239.789,19	$497.973,86	$804.439,90

For the costs and benefits perceived in the project, the Break-even point will be after 2 years and 9 months.

Break-Even: (-171,065.86) / ((14,110.61 + (-171,065.86)) = 0,92

ROI: (2,236,163.35 - 1,431,723.45) / 1,431,723.45 = 56,19%



4. UML Diagrams

4.1. Scope

Although the present document describes a series of features on the app, for the purpose of the project, the UML and Agile planning chapters will focus on the main feature, which is the daily fantasy.

4.2. Use Cases

4.2.1. Stakeholders

Actors	Description
System	The platform
SysAdmin	System manager
User	User who access only the basic functionalities
PaidUser	User who subscribes to the platform
Editor	News editor
Moderator	Manages the forums/comments
Writer	News Writer

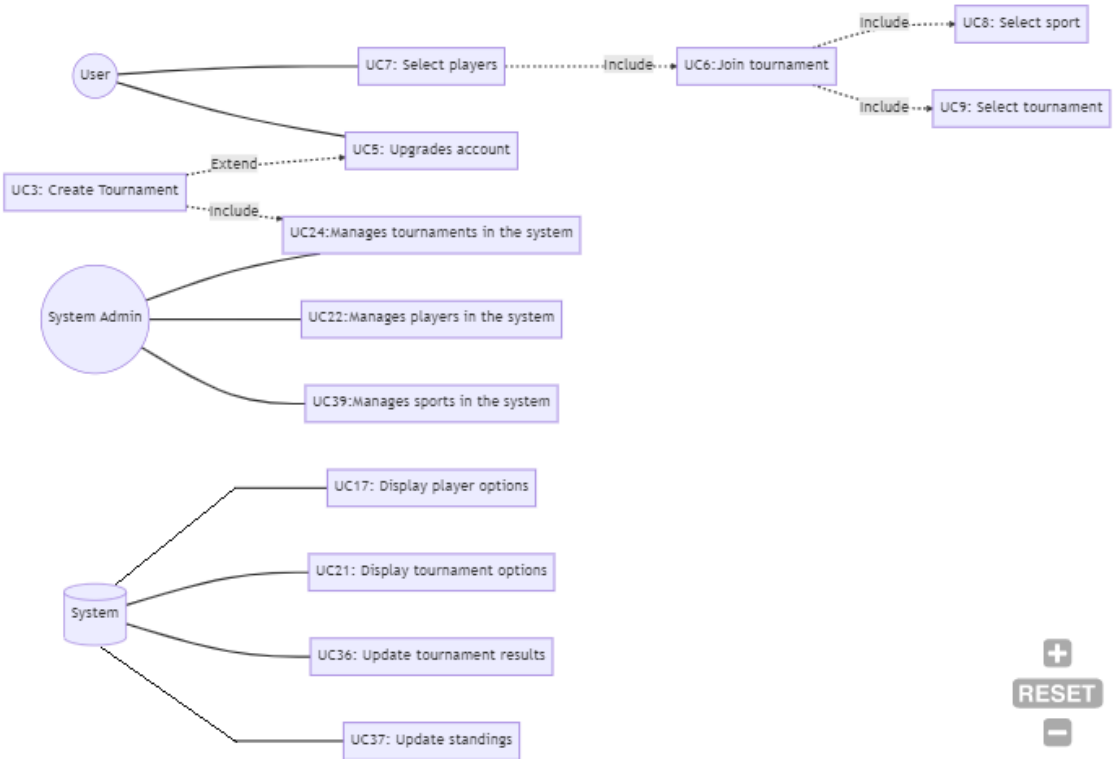
4.2.2. Use Cases

Use Cases	Description	Actor	Feature
UC1	Create account	User	Account
UC5	Upgrades account	User	Account
UC14	Manage profile information	User / Paid User	Account
UC25	Manage accounts	Sys Admin	Account
UC26	Delete account	Sys admin / user / paid user	Account

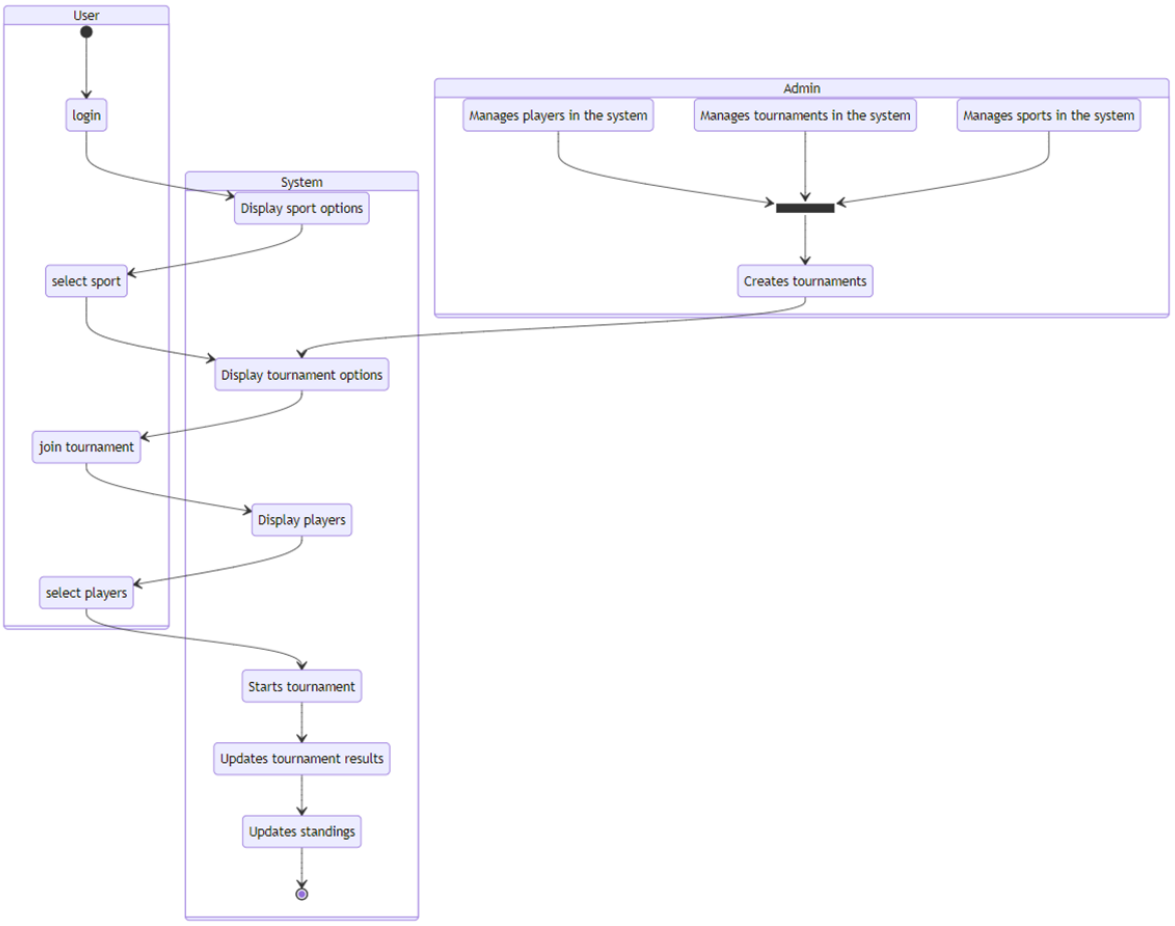
UC27	Downgrade account	Paid User	Account
UC35	Get in contact	User / Paid User	Account
UC38	Login/Logout	User / Paid User	Account
UC3	Create tournament	Paid User/ Sys Admin	Fantasy
UC6	Joins tournaments	User / Paid User	Fantasy
UC7	Select players	User / Paid User	Fantasy
UC8	Select Sport	User / Paid User	Fantasy
UC9	Select Tournaments	User / Paid User	Fantasy
UC21	Display tournament options	System	Fantasy
UC22	Manages players in the system	Sys Admin	Fantasy
UC24	Manages tournaments in the system	Sys Admin	Fantasy
UC36	Updates tournament results	System	Fantasy
UC37	Updates standings	System	Fantasy
UC17	Display player options	System	Fantasy
UC39	Manage sports in the system	Sys Admin	Fantasy
UC4	Delete post from forum	moderator	Forum
UC10	Delete comments on forums	moderator	Forum
UC11	Comments on the forum	User / Paid User	Forum
UC12	Create forums	Paid User/ moderator/sysadmin	Forum
UC13	Delete forums	moderator/sysadmin	Forum
UC32	Delete own forums	Paid User	Forum

UC2	Create content	News Writer	News
UC18	Publishes news posts	Editor	News
UC19	Delete posts	Editor	News
UC20	Edit posts	Editor/ Writer	News
UC28	read news	User / Paid User	News
UC29	Subscribes to newsletter	User / Paid User	News
UC33	Unsubscribe to newsletter	User / Paid User	News
UC30	Reads Special content	Paid User	News
UC31	Comments on Special content	Paid User	News
UC34	Comments on content	User / Paid User	News
UC15	Manage Ad settings	Sys Admin	System
UC16	Displays Ads	System	System

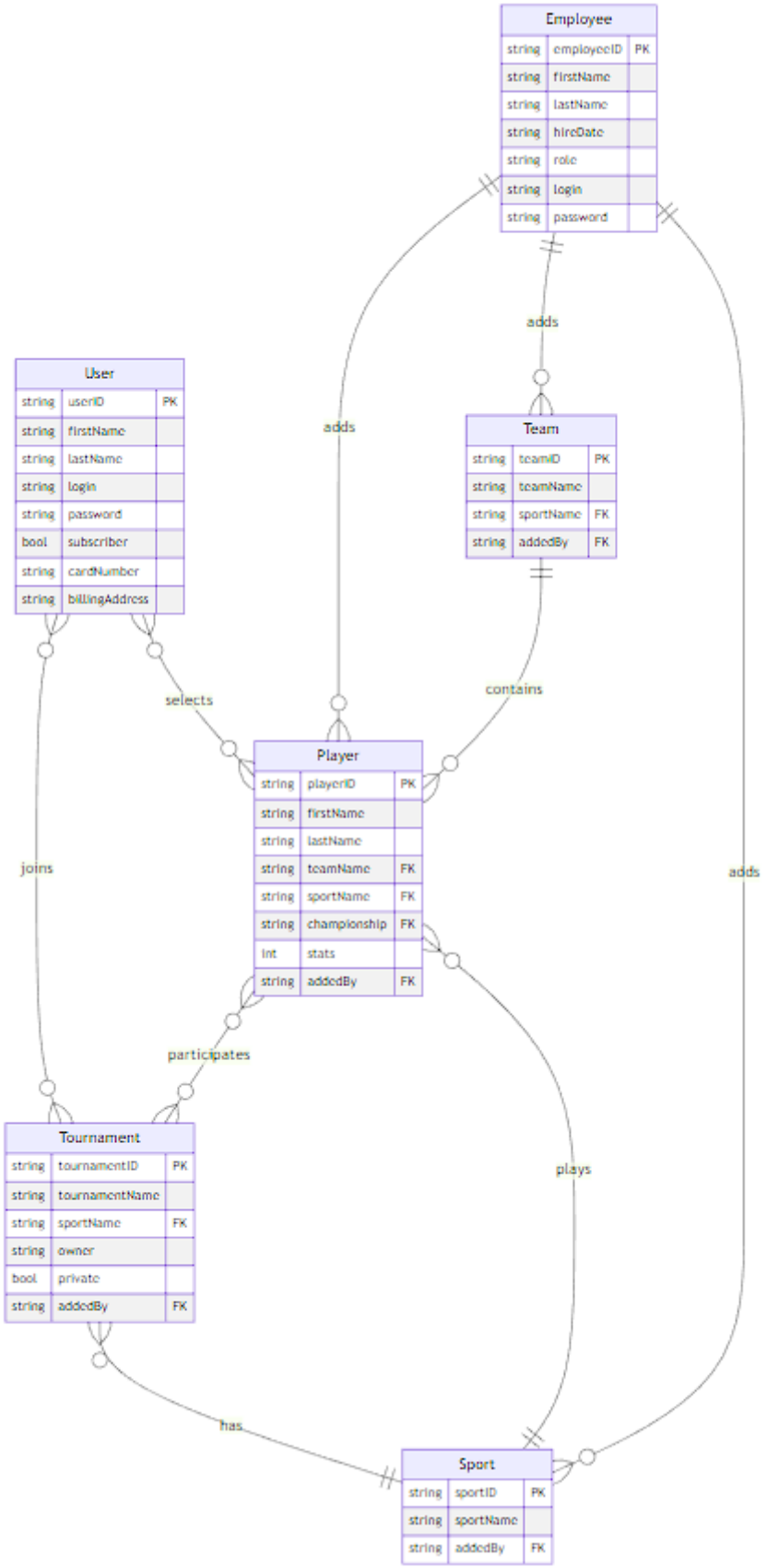
4.2.3. Use Case Diagram



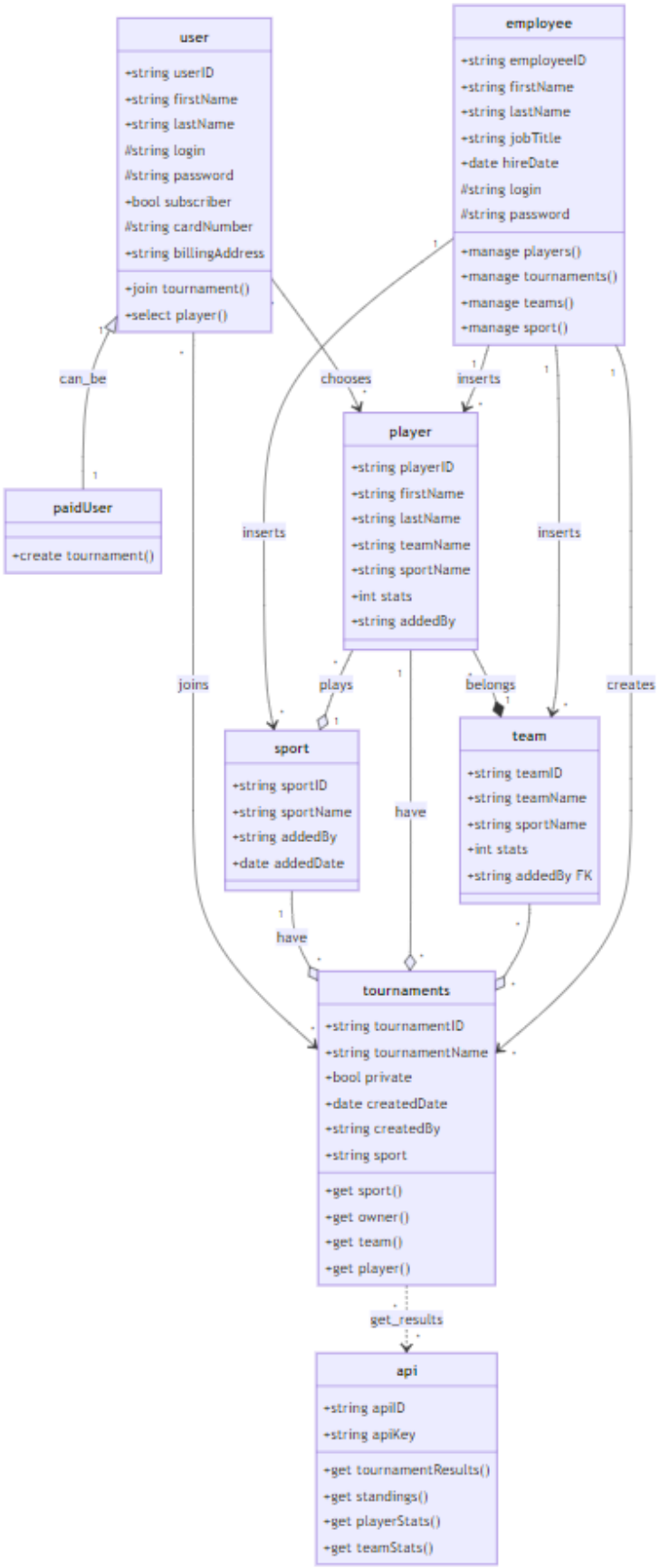
4.3. Activity Diagram



4.4. Entity Relationship Diagram



4.5. Class Diagram



5. Agile Planning

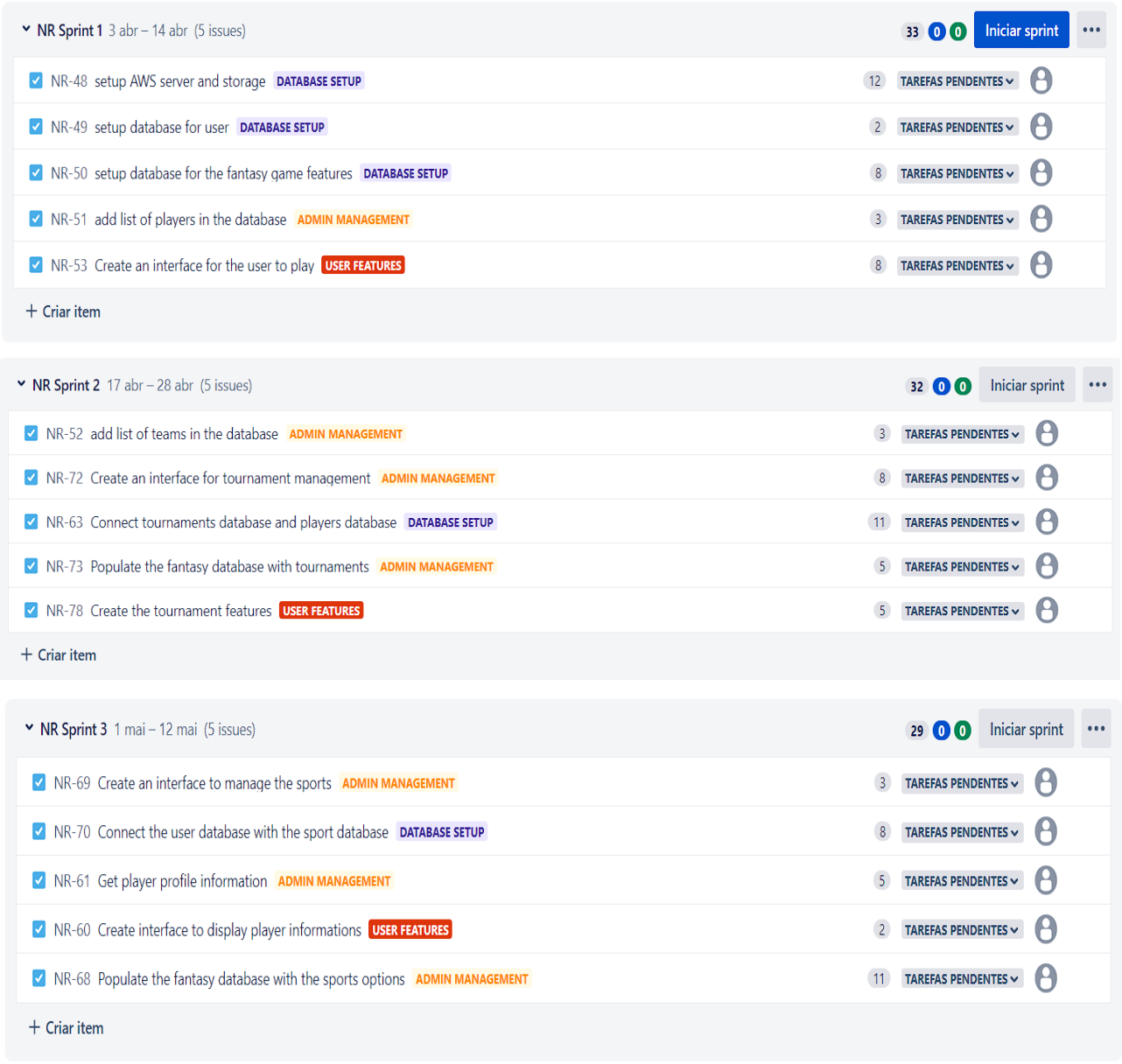
5.1. Product Backlog and MoSCoW analysis

User Story	Description	Story points*	MoSCoW
US2	As a user i need to have access to all players, that way I can create my own dream team	3	Must Have
US3	As a user I need to have access to all tournaments, so I can socialize and compete.	5	Must Have
US6	As a System Administrator, I want to manage players in the system, so the users can have them available in their tournaments	13	Must Have
US7	As a System Administrator, I want to manage tournaments in the system, so the user can join them and play	5	Must Have
US10	As a System Administrator, I want the system to display the player options, so the users can select the players and create their teams	8	Must Have
US1	As a user i need to have access to all sports, so i can freely choose the one i desire	2	Should Have
US8	As a System Administrator, I want the system to update the tournament results automatically from an API, so the users can have access in real-time	8	Should Have
US9	As a System Administrator, I want the system to update the standings after every round, so the users can get their positions instantly	5	Should Have
US11	As a System Administrator, I want to manage the sports available on the platform, so the users can select which ones they want to join.	3	Should Have
US4	As a player I want to create tournaments, so I can play by my rules.	1	Could Have

US5	As a System Admin, I need to dispose the rules of the game, so players can create freely their own tournaments by their rules	2	Could Have

* Story points are based on the Fibonacci sequence

5.2. Sprint Backlog



NR Sprint 4 15 mai – 26 mai (4 issues) — 31 0 0 — Iniciar sprint

NR-57 Display all users inside the tournament	INTERACTIVITY	5	TAREFAS PENDENTES
NR-64 Get team images	ADMIN MANAGEMENT	2	TAREFAS PENDENTES
NR-59 Create interface to display player stats	USER FEATURES	13	TAREFAS PENDENTES
NR-62 Get player images	ADMIN MANAGEMENT	11	TAREFAS PENDENTES

+ Criar item

NR Sprint 5 29 mai – 9 jun (4 issues) — 27 0 0 — Iniciar sprint

NR-65 Create user interaction features	INTERACTIVITY	5	TAREFAS PENDENTES
NR-58 Display competitor's information	INTERACTIVITY	3	TAREFAS PENDENTES
NR-77 Create API to feed the fantasy database with external data	DATABASE SETUP	8	TAREFAS PENDENTES
NR-76 Grant access to external databases	DATABASE SETUP	11	TAREFAS PENDENTES

+ Criar item

NR Sprint 6 12 jun – 23 jun (3 issues) — 16 0 0 — Iniciar sprint

NR-66 Collect user's results	INTERACTIVITY	8	TAREFAS PENDENTES
NR-71 Add the sport option feature to the user interface	USER FEATURES	3	TAREFAS PENDENTES
NR-67 Create a filter to determine real-time standings	INTERACTIVITY	5	TAREFAS PENDENTES

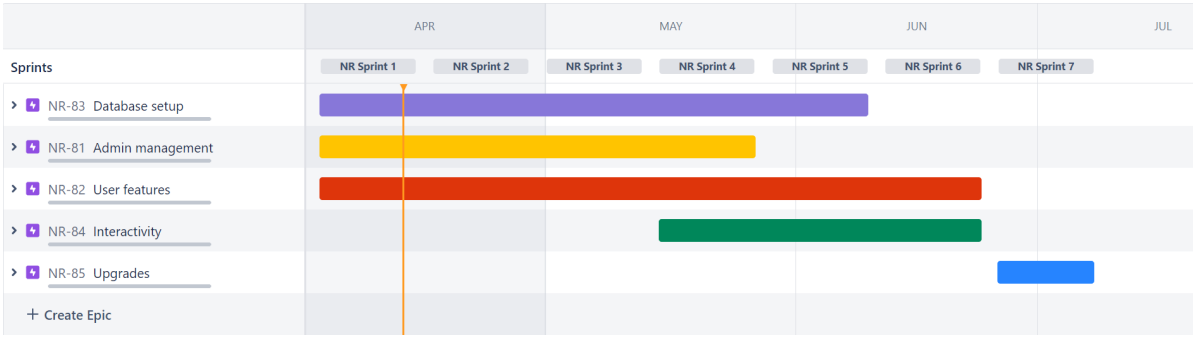
+ Criar item

NR Sprint 7 26 jun – 7 jul (4 issues) — 27 0 0 — Iniciar sprint

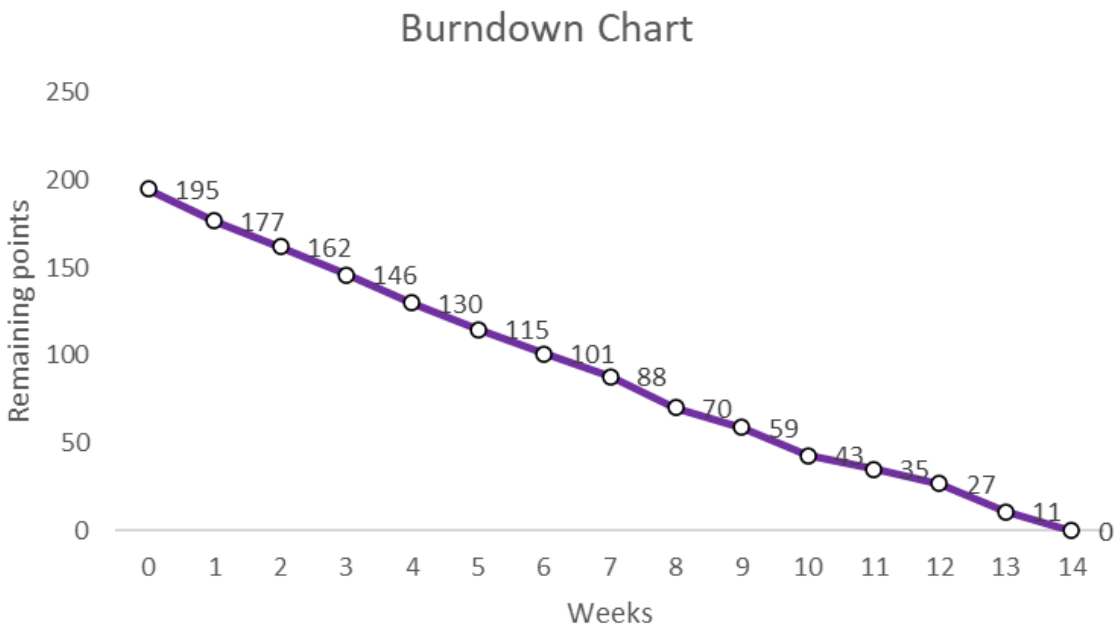
NR-79 Apply business rule to allow only paid users to access the feature	UPGRADES	8	TAREFAS PENDENTES
NR-74 Create more tournament options	UPGRADES	5	TAREFAS PENDENTES
NR-80 Create new tournament interface	UPGRADES	11	TAREFAS PENDENTES
NR-75 Add additional features to the existing user interface	UPGRADES	3	TAREFAS PENDENTES

+ Criar item

5.3. Planning (JIRA)



5.4. Burndown Chart



6. References

6.1. Source codes for Use Case Diagrams

```
---
Use Case Diagram - Fantasy
---

flowchart LR
user((User))
user --- UC7[UC7: Select players]
UC7[UC7: Select players] -.->|Include| UC6[UC6:Join tournament]
user --- UC5[UC5: Upgrades account]
UC3 -.->|Extend| UC5[UC5: Upgrades account]
UC6 -.->|Include| UC8[UC8: Select sport]
UC6 -.->|Include| UC9[UC9: Select tournament]


sysAdmin((System Admin))
sysAdmin --- UC24[UC24:Manages tournaments in the system]
UC3[UC3: Create Tournament] -.->|Include| UC24
sysAdmin --- UC22[UC22:Manages players in the system]
sysAdmin --- UC39[UC39:Manages sports in the system]


system[(System)]
system --- UC17[UC17: Display player options]
system --- UC21[UC21: Display tournament options]
system --- UC36[UC36: Update tournament results]
system --- UC37[UC37: Update standings]
```

6.2. Source Code for ERD

```
---
ERD - Fantasy
---
```

```
erDiagram

%% entities
User{
    string userID PK
    string firstName
    string lastName
    string login
    string password
    bool subscriber
    string cardNumber
    string billingAddress
}

Player{
string playerID PK
string firstName
string lastName
string teamName FK
string sportName FK
string championship FK
int stats
string addedBy FK
}

Sport{
string sportID PK
string sportName
string addedBy FK
}

Tournament{
string tournamentID PK
string tournamentName
string sportName FK
string owner
bool private
string addedBy FK
}

Team{
string teamID PK
```

```
string teamName
string sportName FK
string addedBy FK
}

Employee{
string employeeID PK
string firstName
string lastName
string hireDate
string role
string login
string password
}

%%relationships
User }o--o{ Tournament : joins
User }o--o{ Player : selects
Player }o--o{ Tournament : participates
Player }o--|| Sport : plays
Tournament }o--|| Sport : has
Team ||--o{ Player : contains
Employee ||--o{ Player : adds
Employee ||--o{ Team : adds
Employee ||--o{ Sport : adds


---
Class Diagram - Fantasy
---

classDiagram
    class user{
     +string userID
     +string firstName
     +string lastName
     #string login
     #string password
     +bool subscriber
     #string cardNumber
     +string billingAddress
     +join tournament()
```

```
 +select player()


}

class paidUser{

 +create tournament()

}

class employee{
 +string employeeID
 +string firstName
 +string lastName
 +string jobTitle
 +date hireDate
 #string login
 #string password
 +manage players()
 +manage tournaments()
 +manage teams()
 +manage sport()

}

class api{
    +string apiID
    +string apiKey
    +get tournamentResults()
    +get standings()
    +get playerStats()
    +get teamStats()


}

class tournaments{
    +string tournamentID
    +string tournamentName
    +bool private
    +date createdDate
```

```
        +string createdBy
        +string sport
        +get sport()
        +get owner()
        +get team()
        +get player()
    }

    class sport{
        +string sportID
        +string sportName
        +string addedBy
        +date addedDate
    }
    class player{
        +string playerID
        +string firstName
        +string lastName
        +string teamName
        +string sportName
        +int stats
        +string addedBy
    }

class team{
        +string teamID
        +string teamName
        +string sportName
        +int stats
        +string addedBy FK
    }

%% relationships
user "1" <|-- "1" paidUser: can_be
user "*" --> "*" tournaments: joins
player "*" --* "1" team: belongs


sport "1" --o "*" tournaments: have
player "1" --o "*" tournaments: have
team "*" --o "*" tournaments
user "*" --> "*" player: chooses
```

```
employee "1" --> "*" player: inserts
employee "1" --> "*" team: inserts
employee "1" --> "*" sport: inserts
employee "1" --> "*" tournaments: creates
player "*" --o "1" sport: plays
tournaments "*" ..> "*" api: get_results
```

6.3. Source Code for Activity Diagram

```
---
Activity Diagram - Fantasy
---


stateDiagram-v2
state User{
    [*] --> u4
    u4 -->s6
    s6 -->u3
    u3 --> s1
    s1 --> u1
    u1 --> s2
    s2 --> u2
    u2 --> s5
    s5 --> s3
    s3 --> s4
    a3 --> s1

    %%Use Cases
    u1: join tournament
    u2: select players
    u3: select sport
    u4: login
}


state System{
```

```
%%Use Cases
s1: Display tournament options
s2: Display players
s3: Updates tournament results
s4: Updates standings
s5: Starts tournament
s6: Display sport options


s4 --> [*]


}


state Sys Admin{


%%Use Cases
a1: Manages players in the system
a2: Manages tournaments in the system
a3: Creates tournaments
a4: Manages sports in the system


state join_state <<fork>>
a1 --> join_state
a2 --> join_state
a4 --> join_state
join_state --> a3
}
```