COMP 3005 Project 1

Owen Petersen

101233850

10 April 2024

1 Conceptual Design

The Entity Relation diagram show below in **Figure 1** contains the full conceptual design of the database. The database consists of the following tables:

- Competitions: storing data from the competitions.json file
- Matches: storing the relevant matches from the match.json files
- Managers: storing the manager data from the match.json files
- Lineups: storing the information about a given lineup from the lineups.json files
- Players: storing all players found in the lineups.json files
- Events: storing all data from the relevant events.json files

And the remaining tables (seen to the right of **Figure 1**) are for storing the additional attributes associated with specific event types.

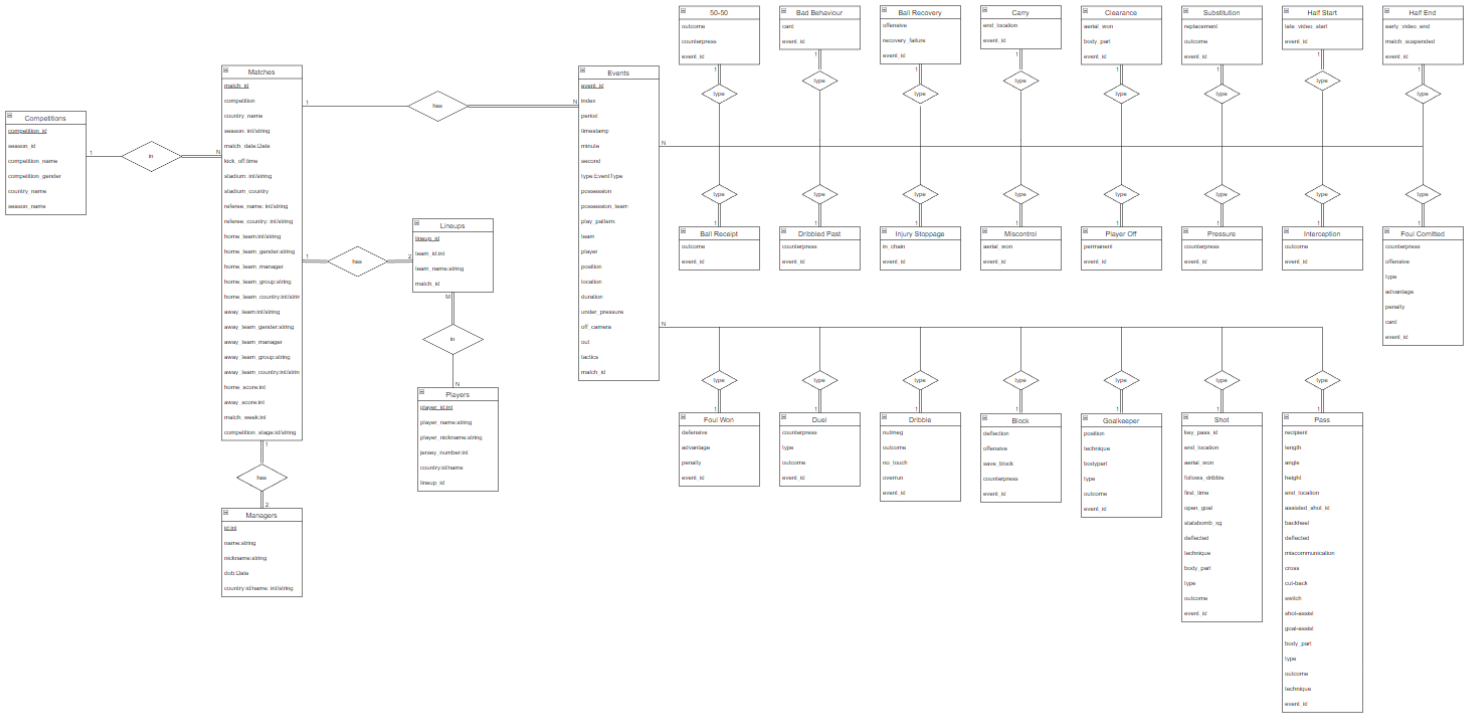

Figure 1

The relationship between competitions and Matches is one-to-many since there are numerous matches for a single Competition which means the relation can be represented as a foreign key in Matches referring to its competition. There is a similar situation with relationships between matches and managers and matches and lineups where we have a one-to-many relationship with mandatory participation. Each of these relationships is represented as a foreign key in matches referring to managers and a foreign key in lineups referring to matches. There is also a many-to-many relationship between lineups and players which requires an additional table to be represented.

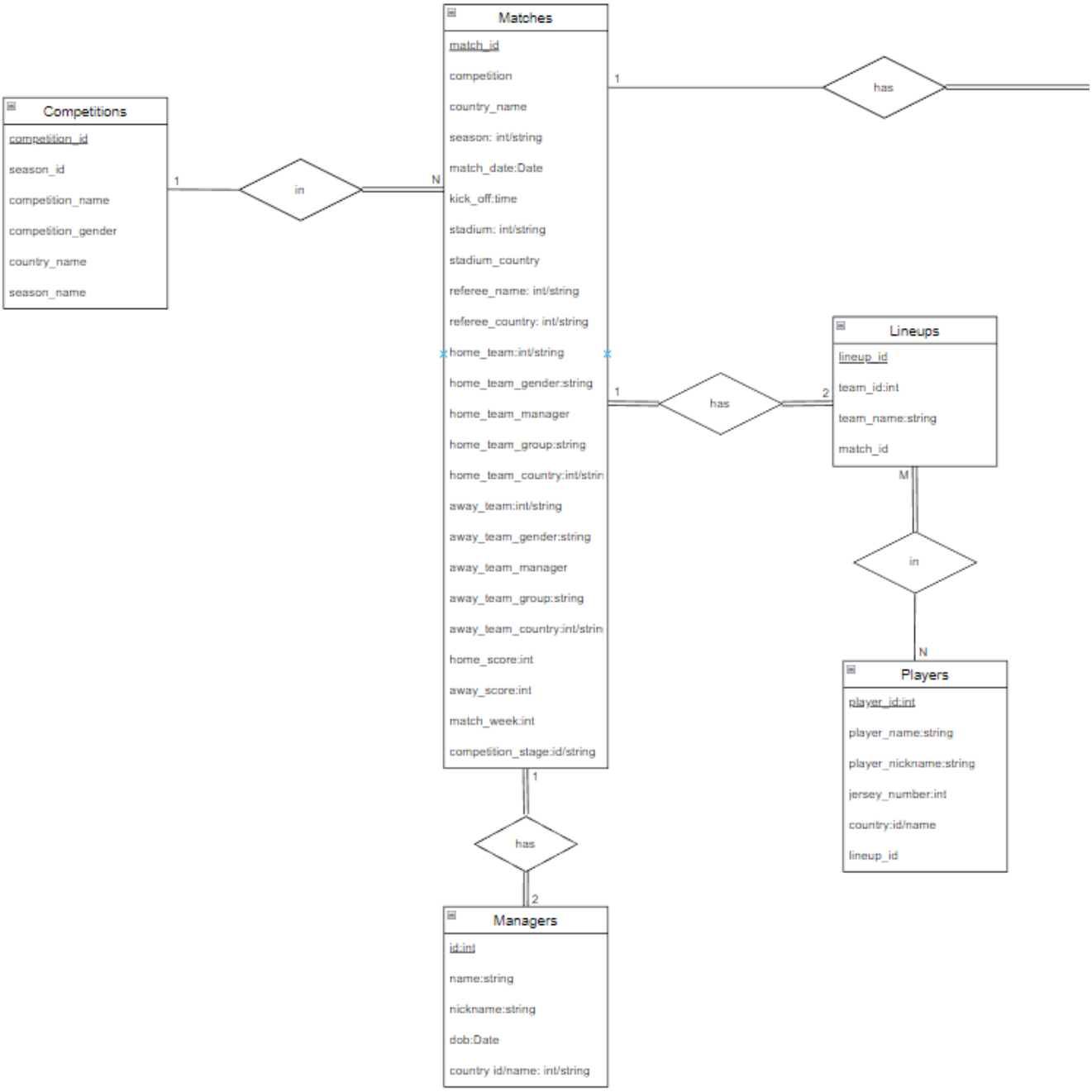
Matches
match_id
competition
country_name
season: int/string
match_date:Date
kick_off:time
stadium: int/string
stadium_country
referee_name: int/string
referee_country: int/string
home_team:int/string
home_team_gender:string
home_team_manager
home_team_group:string
home_team_country:int/strin
away_team:int/string
away_team_gender:string
away_team_manager
away_team_group:string
away_team_country:int/strin
home_score:int
away_score:int
match_week:int
competition_stage:id/string
Competitions
competition_id
season_id
competition_name
competition_gender
country_name
season_name
in
1
N
has
1
Lineups
lineup_id
team_id:int
team_name:string
match_id
has
1
2
M
in
N
Players
player_id:int
player_name:string
player_nickname:string
jersey_number:int
country:id/name
lineup_id
has
1
2
Managers
id:int
name:string
nickname:string
dob:Date
country id/name: int/string

Figure 2

The relationship between matches and events is one-to-many and it is implemented as a foreign key in each event referring to its match. The relationship between events and all event type tables is also one-to-many, each event type table has a foreign key referring the event that the attributes are associated with.

Figure 3

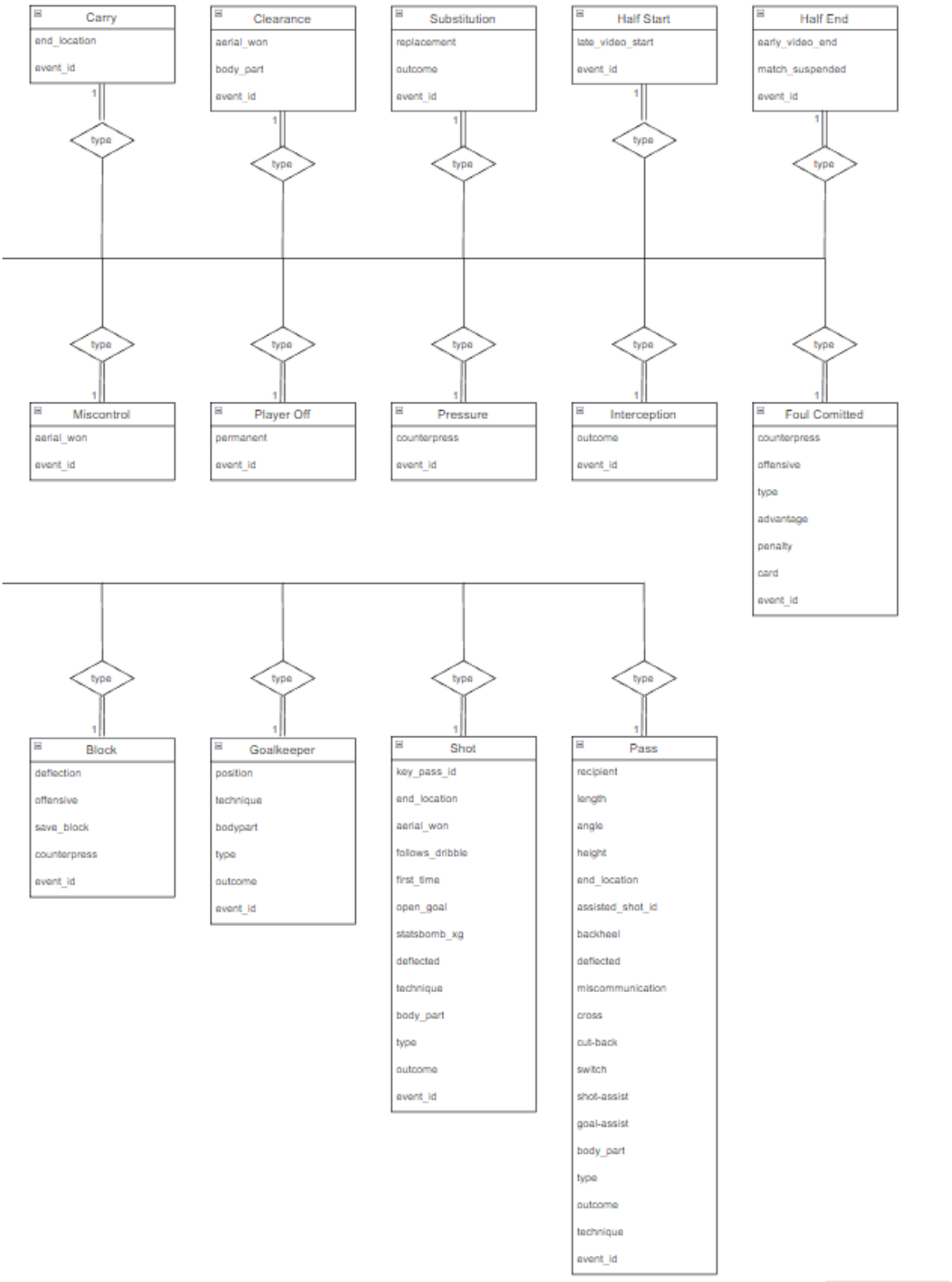
Carry
end_location
event_id
Clearance
aerial_won
body_part
event_id
Substitution
replacement
outcome
event_id
Half Start
late_video_start
event_id
Half End
early_video_end
match_suspended
event_id
type
Miscontrol
aerial_won
event_id
Player Off
permanent
event_id
Pressure
counterpress
event_id
Interception
outcome
event_id
Foul Comitted
counterpress
offensive
type
advantage
penalty
card
event_id
Block
deflection
offensive
save_block
counterpress
event_id
Goalkeeper
position
technique
bodypart
type
outcome
event_id
Shot
key_pass_id
end_location
aerial_won
follows_dribble
first_time
open_goal
statsbomb_xg
deflected
technique
body_part
type
outcome
event_id
Pass
recipient
length
angle
height
end_location
assisted_shot_id
backheel
deflected
miscommunication
cross
cut-back
switch
shot-assist
goal-assist
body_part
type
outcome
technique
event_id

Figure 4

2 Reduction to Relation Schemas

The complete relation schema is shown below in **Figure 5**. Additional images are shown further below in this section displaying portions of **Figure 5** enlarged for easier viewing.

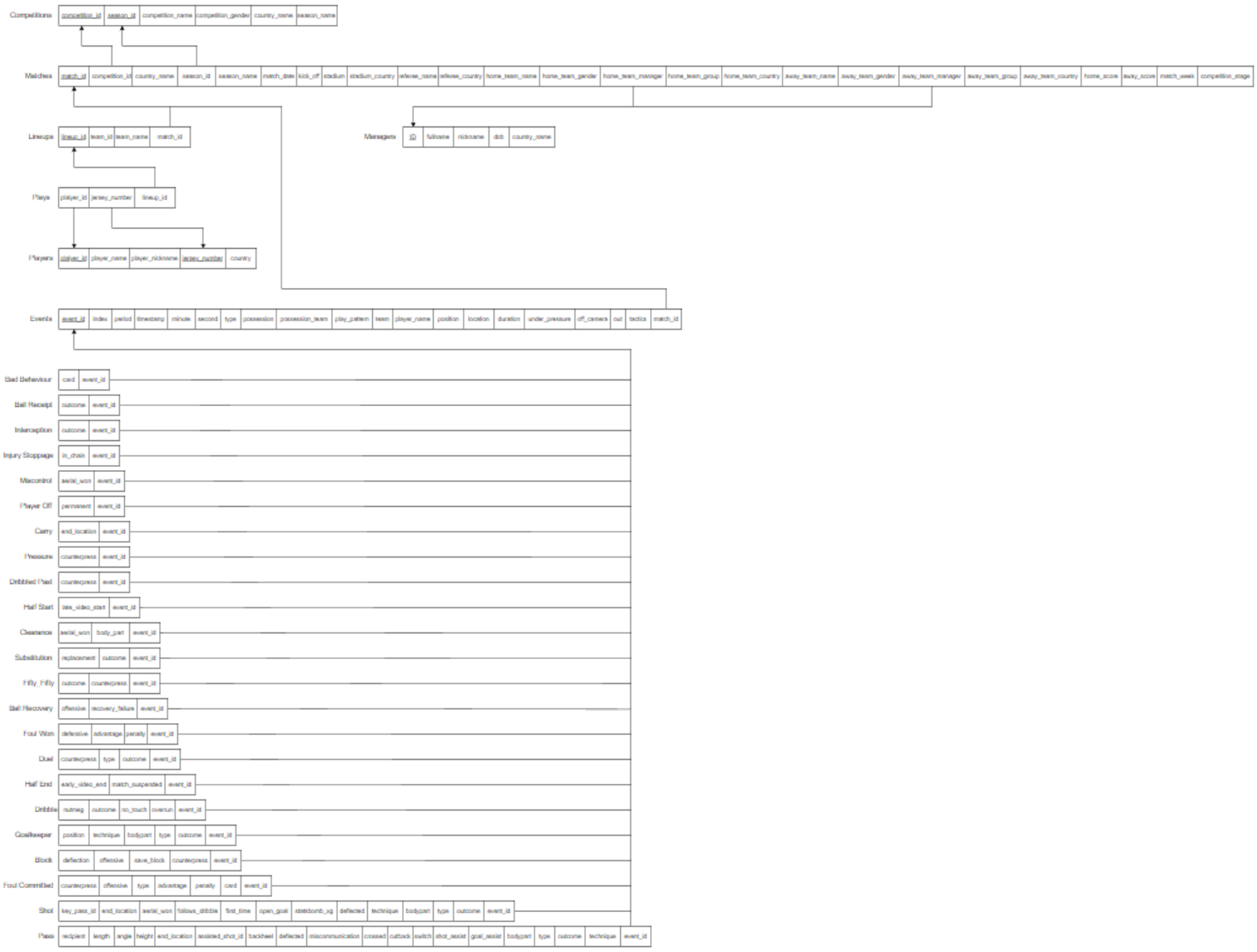

Figure 5

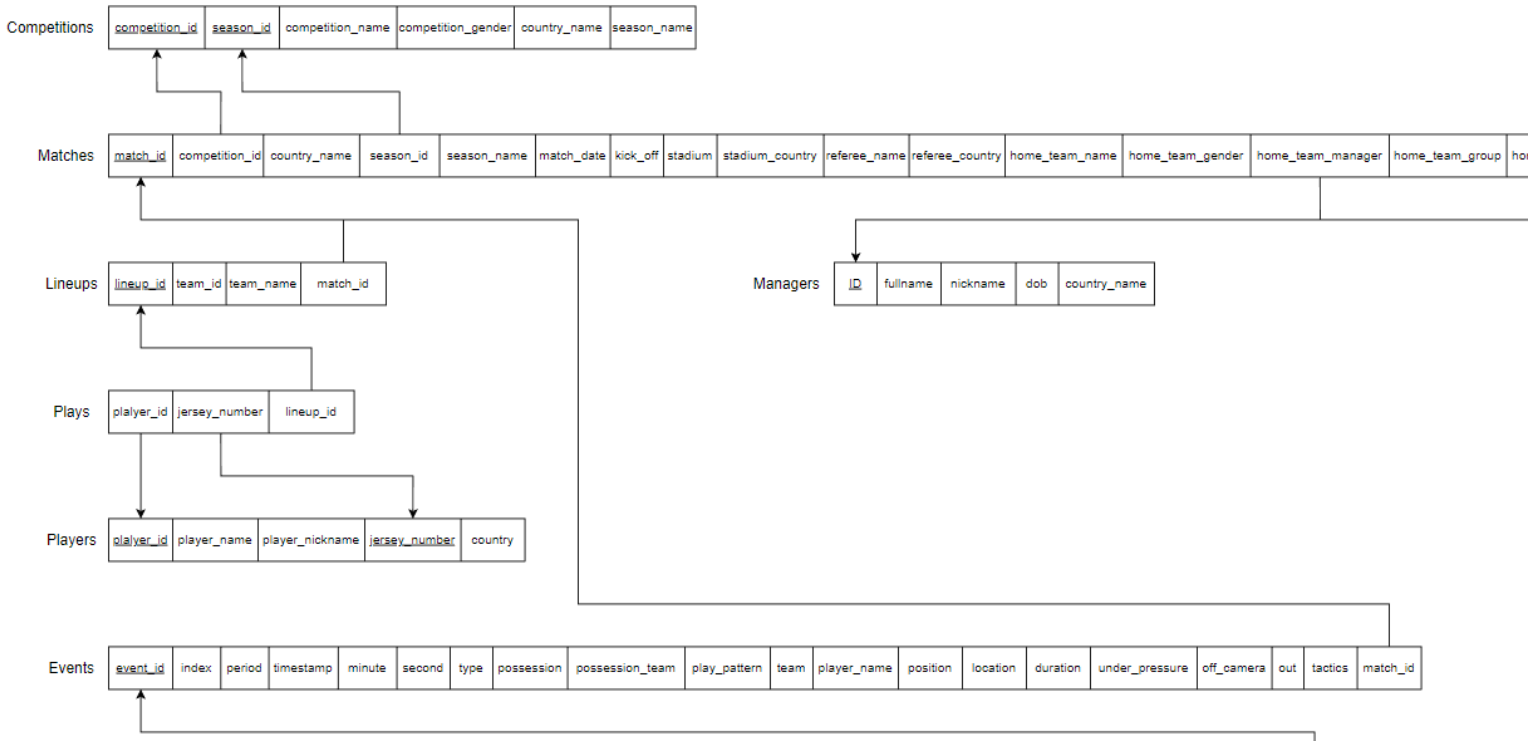

Figure 6

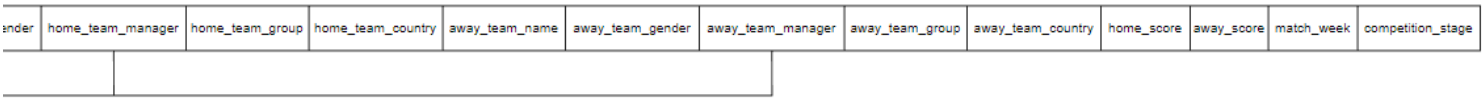

Figure 7

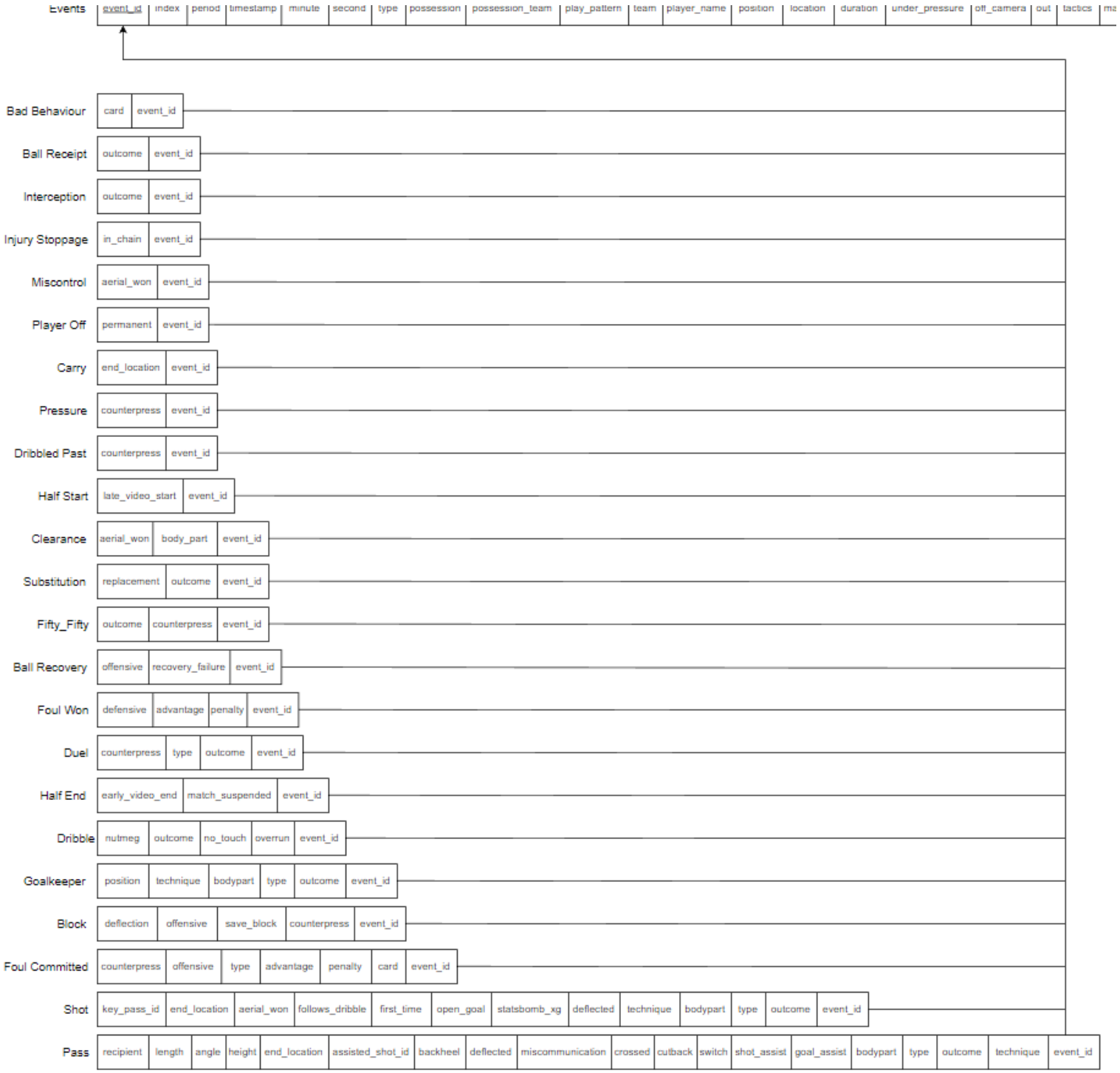
Events
event_id
index
period
timestamp
minute
second
type
possession
possession_team
play_pattern
team
player_name
position
location
duration
under_pressure
off_camera
out
tactics
Bad Behaviour
card
event_id
Ball Receipt
outcome
event_id
Interception
outcome
event_id
Injury Stoppage
in_chain
event_id
Miscontrol
aerial_won
event_id
Player Off
permanent
event_id
Carry
end_location
event_id
Pressure
counterpress
event_id
Dribbled Past
counterpress
event_id
Half Start
late_video_start
event_id
Clearance
aerial_won
body_part
event_id
Substitution
replacement
outcome
event_id
Fifty_Fifty
outcome
counterpress
event_id
Ball Recovery
offensive
recovery_failure
event_id
Foul Won
defensive
advantage
penalty
event_id
Duel
counterpress
type
outcome
event_id
Half End
early_video_end
match_suspended
event_id
Dribble
nutmeg
outcome
no_touch
overrun
event_id
Goalkeeper
position
technique
bodypart
type
outcome
event_id
Block
deflection
offensive
save_block
counterpress
event_id
Foul Committed
counterpress
offensive
type
advantage
penalty
card
event_id
Shot
key_pass_id
end_location
aerial_won
follows_dribble
first_time
open_goal
statsbomb_xg
deflected
technique
bodypart
type
outcome
event_id
Pass
recipient
length
angle
height
end_location
assisted_shot_id
backheel
deflected
miscommunication
crossed
cutback
switch
shot_assist
goal_assist
bodypart
type
outcome
technique
event_id

Figure 8

3 Database Schema Diagram

The final database schema diagram shown below represents all tables, their attributes, and the foreign keys connecting the various tables.

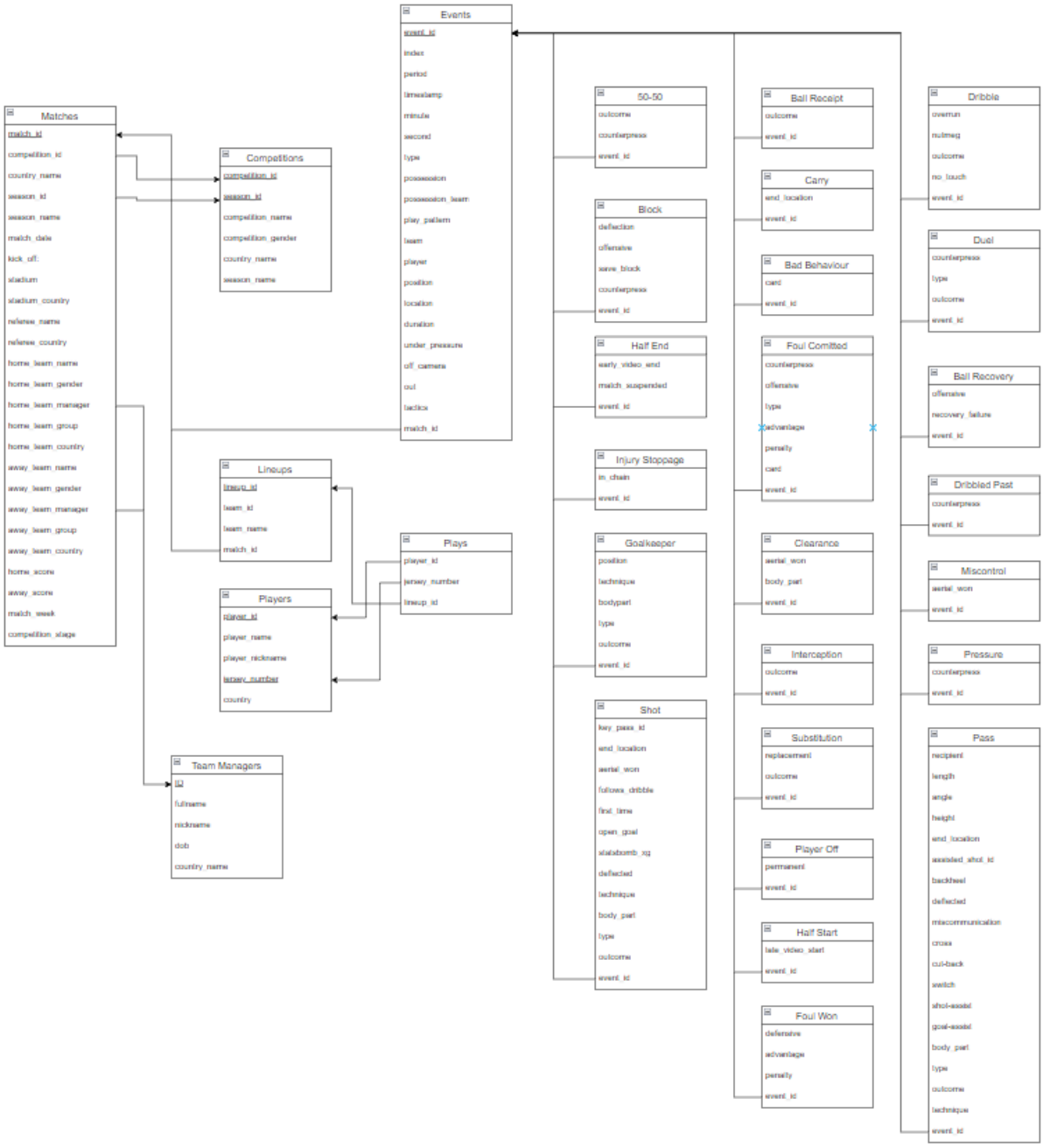

Figure 9

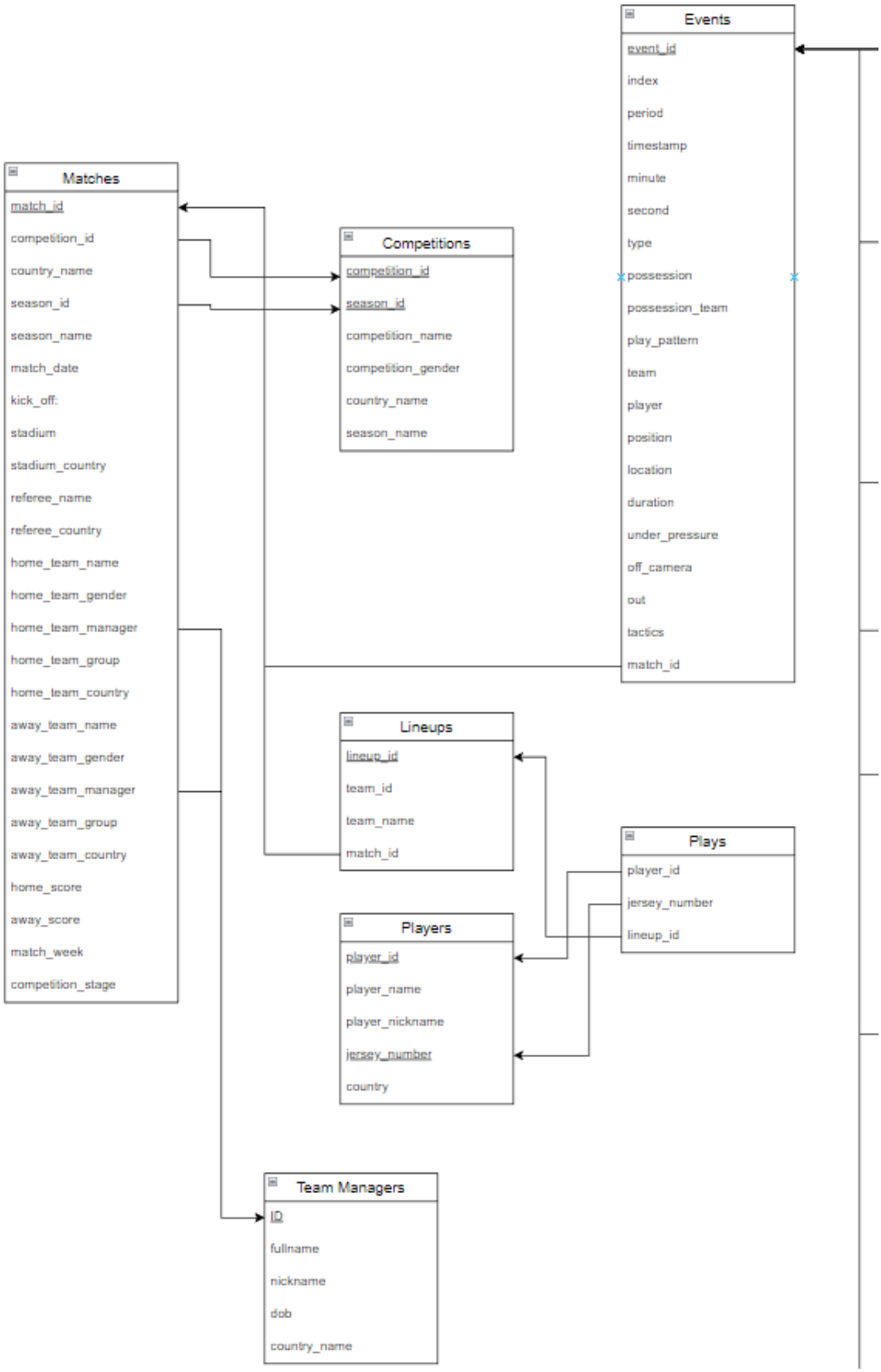
Events
event_id
index
period
timestamp
minute
second
type
possession
possession_team
play_pattern
team
player
position
location
duration
under_pressure
off_camera
out
tactics
match_id
Matches
match_id
competition_id
country_name
season_id
season_name
match_date
kick_off:
stadium
stadium_country
referee_name
referee_country
home_team_name
home_team_gender
home_team_manager
home_team_group
home_team_country
away_team_name
away_team_gender
away_team_manager
away_team_group
away_team_country
home_score
away_score
match_week
competition_stage
Competitions
competition_id
season_id
competition_name
competition_gender
country_name
season_name
Lineups
lineup_id
team_id
team_name
match_id
Plays
player_id
jersey_number
lineup_id
Players
player_id
player_name
player_nickname
jersey_number
country
Team Managers
ID
fullname
nickname
dob
country_name

Figure 10

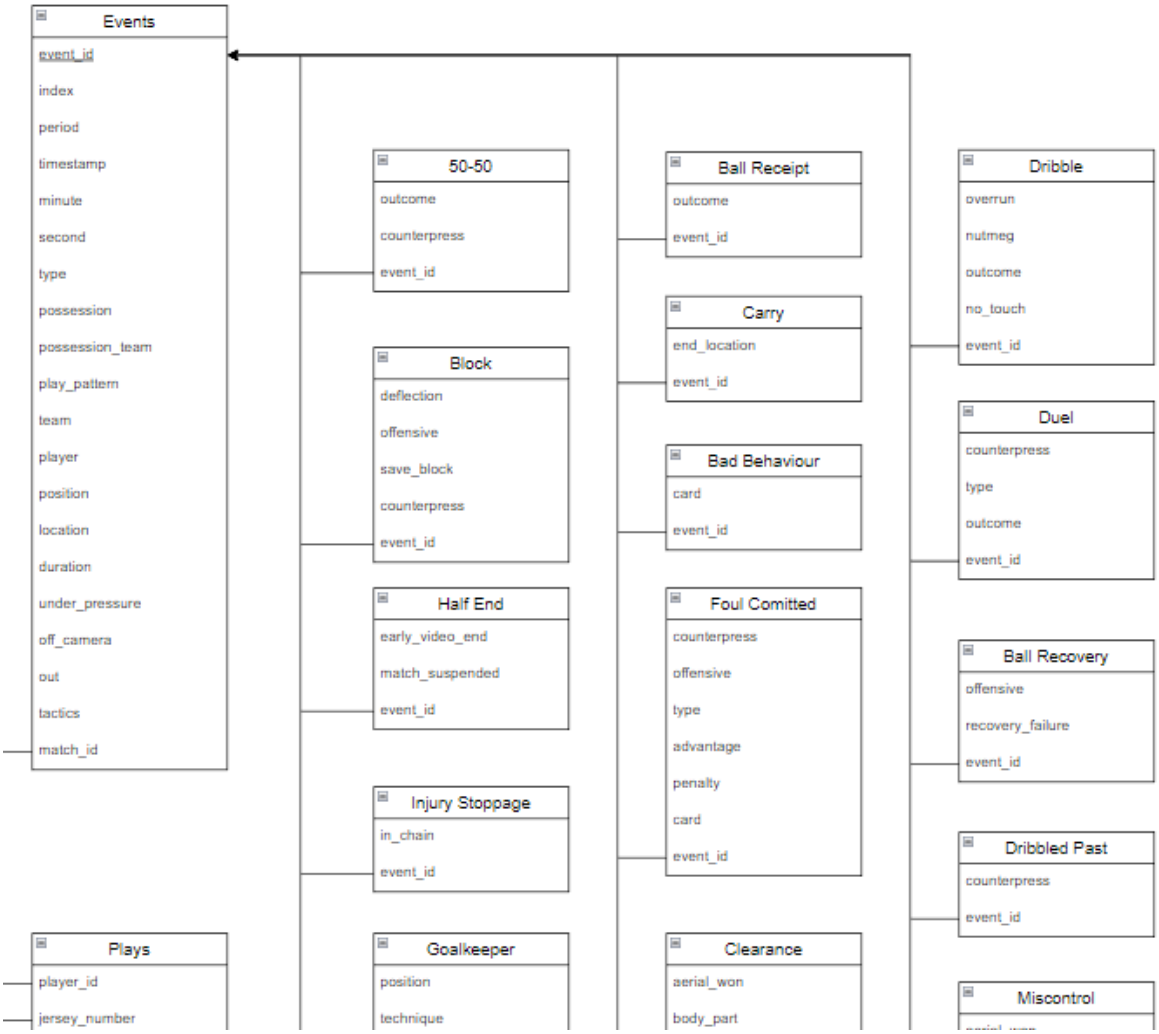
Events
event_id
index
period
timestamp
minute
second
type
possession
possession_team
play_pattern
team
player
position
location
duration
under_pressure
off_camera
out
tactics
match_id
Plays
player_id
jersey_number
50-50
outcome
counterpress
event_id
Block
deflection
offensive
save_block
counterpress
event_id
Half End
early_video_end
match_suspended
event_id
Injury Stoppage
in_chain
event_id
Goalkeeper
position
technique
Ball Receipt
outcome
event_id
Carry
end_location
event_id
Bad Behaviour
card
event_id
Foul Comitted
counterpress
offensive
type
advantage
penalty
card
event_id
Clearance
aerial_won
body_part
Dribble
overrun
nutmeg
outcome
no_touch
event_id
Duel
counterpress
type
outcome
event_id
Ball Recovery
offensive
recovery_failure
event_id
Dribbled Past
counterpress
event_id
Miscontrol

Figure 11

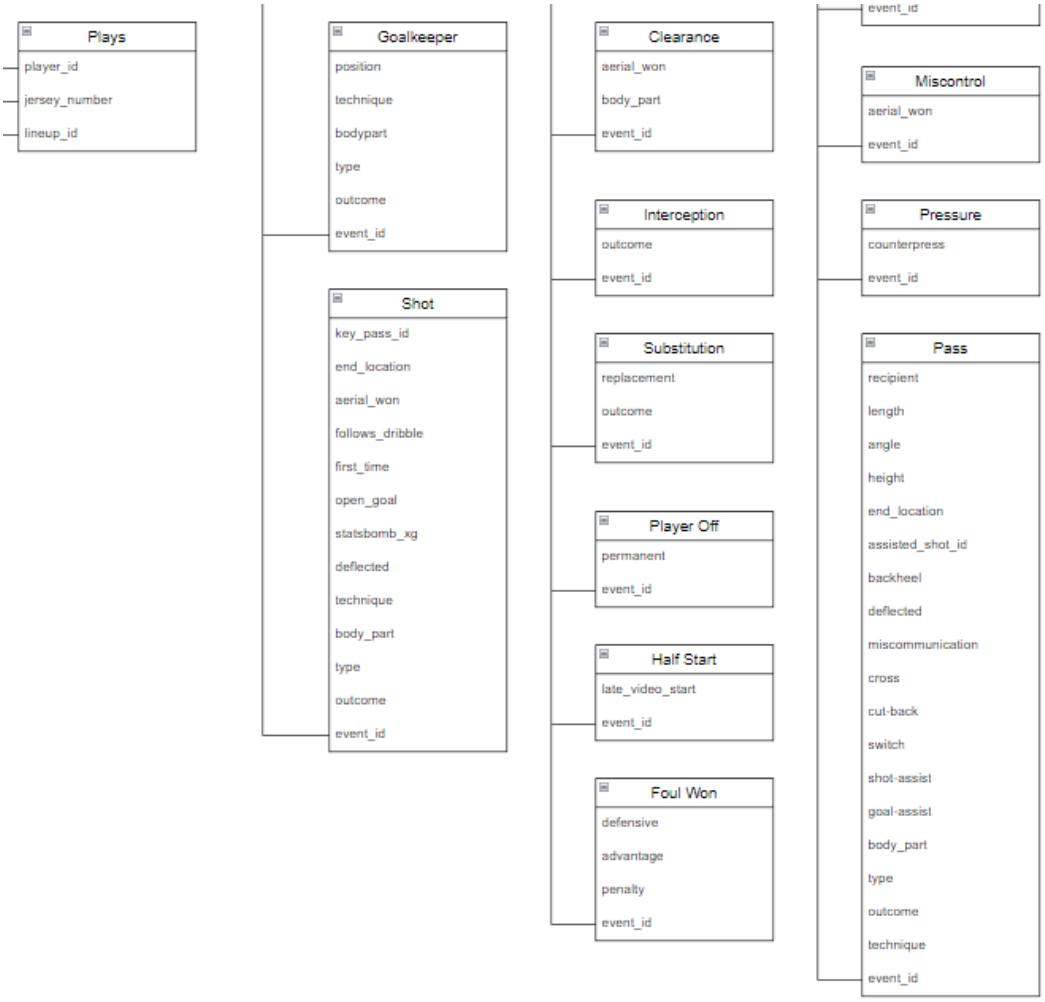
Plays
player_id
jersey_number
lineup_id
Goalkeeper
position
technique
bodypart
type
outcome
event_id
Shot
key_pass_id
end_location
aerial_won
follows_dribble
first_time
open_goal
statsbomb_xg
deflected
technique
body_part
type
outcome
event_id
Clearance
aerial_won
body_part
event_id
Interception
outcome
event_id
Substitution
replacement
outcome
event_id
Player Off
permanent
event_id
Half Start
late_video_start
event_id
Foul Won
defensive
advantage
penalty
event_id
Miscontrol
aerial_won
event_id
Pressure
counterpress
event_id
Pass
recipient
length
angle
height
end_location
assisted_shot_id
backheel
deflected
miscommunication
cross
cut-back
switch
shot-assist
goal-assist
body_part
type
outcome
technique
event_id

Figure 12