openSAP

IMAGINE IOT
PROTOTYPE CHALLENGE

Bird’s Eye View App for Football Coaches

SUBMISSION REQUIREMENTS

Matthias Hau
A football/soccer coach has to improve his team and his players permanently, to reach all team goals and targets.

During a football match, he has several problems:

- Poor point of view from where he watches the game (no overview)
- No chance to keep all relevant match situations in mind until he speaks again with his players
- Difficulties in explaining all these very complex match situations to his players, in order to show what went wrong before the opponent team scored

Here, the Internet of Things might help:

Spatial sensors can collect the position of every single player and the ball in every tenth of a second during the whole game. All these position data enable a “bird’s eye view”: the position and the movement of every single player can be shown in real time on an usual tablet. And by storing these position data, every single situation of the game is reproducible: so the football coach is able show all relevant match situations to his players at any arbitrary moment.
Persona

Joachim Löw
Head Coach of the
German Football National Team

“I like to make my players better every day and improve my team in every single match – by using the best technology available.”

About

- 56 years old, married, two children
- Since 2006 Head Coach of Germany’s Football National Team
- 2014: World Champion, FIFA World Cup Winner (in Brazil)
- 2014: FIFAs World Coach of the Year

Responsibilities

- Responsible for the development of the German national team
- Responsible for the success of the team and the players
- As the most important coach within the German Football Association (DFB) also responsible for the youth team’s progress
- Is (together with his team staff) able to develop and create new technologies which also might help other coaches in smaller German football clubs

Main Tasks and Goals

- to analyze the opponent’s game tactics (realtime, during the game) and to react appropriately
- to see, evaluate and “save” many important scenes during the game and
- to improve my players and my team by discussing these scenes (during the half time break, right after the game, or during our training sessions on weekdays)

Needs

- needs the best technology available to improve his team and his players in every respect
- needs an “overall view” during the football game to see all relevant things completely
- needs a technology which shows his players all relevant situations out of the game (for example in the halftime break)

Pain Points

- During a football game, the position from where he watches the game (i.e. his position beside the coach’s bench) is really suboptimal: Standing directly beside the pitch, he has difficulties to get an overview of the whole pitch, the positions of all the players and the distances between the players.
- Moreover, it is very difficult for him to describe single situations or scenes to his players, for example 30 minutes after the opponent team had scored, when his team meets in the locker room,
- It’s impossible to save and keep in mind all these parameters just by watching the scene from a 60 m distance from his point of view.
As a football/soccer coach

I need a way/technology

to get a much better overview about the football pitch (in real time, during the game!),
to store all relevant match situations and scenes, which I want to discuss with my team later, and
to show my players all these situations from an “objective and total view”

so that I can

see all single positions and movements of the players and the distances between my defenders and
discuss all relevant scenes together with my team based on a common “bird’s eye view”.
# User Experience Journey

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>Kick-Off: The match starts</th>
<th>Opponents goal: 0-1</th>
<th>Opponent’s Right Midfielder breaks through again and again</th>
<th>Our goal: 1-1</th>
<th>Halftime Break</th>
<th>Team Meeting on Monday Morning</th>
</tr>
</thead>
<tbody>
<tr>
<td>MINDSET</td>
<td>What is their game strategy? Which system do they play?</td>
<td>How could this happen? Why could they pass between our two central defenders?</td>
<td>Who in my team is responsible for this midfielder? Why can’t he stop him? Where are my midfielders running around?</td>
<td>YYESSS !!! Perfect counter attack – beautiful goal. Exactly what we trained last week ...</td>
<td>I saw, we are pretty poor on our left wing. We should change the following: ...</td>
<td>Let us speak about several situations I considered as relevant to discuss: Situation No 1: .....</td>
</tr>
<tr>
<td>FEELING</td>
<td>🙄</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>TOUCH POINTS</td>
<td>• Newspapers • Opponent’s team manager • Opponent’s team lineup / team selection</td>
<td>• Display Panel in the stadium • Short interaction with my assistant coach</td>
<td>• “Gut instinct” • Longer discussions with my assistant coach</td>
<td>• 57.500 spectators in ecstasy !!! • My Team and my Staff, as well</td>
<td>• Team’s locker room • blackboard</td>
<td>• Team's meeting room • TV recordings / videos • Monitor</td>
</tr>
</tbody>
</table>
We start in “Screen 0” (see top left) of the prototype. This is just an Intro Screen. Please press the [Next]-Button.

In Screen 1 you see the “Bird’s Eye View” of a football/soccer game. The spatial geo data of all players are transferred via IoT sensors to the app. The exact positions for all players are determined in every tenth of a second of the game. In real time, the position of all players on the pitch is shown “in bird’s eye view” on the coaches tablet. So the coach can see all 22 players moving around during the game.

At the beginning of the match (time = 00:00), the coach starts the recording: This means that all position data is stored to a database for later use together with the corresponding time.

At the end of the match, the coach stops the recording of the position data.

In the “Marked Pictures / Video Sequences” area, a list of marked scenes or situations of the football game is shown. You can see that the coach already marked a 10 sec video scene (after 05:23 min of the game), in which a corner of his own team is saved and in which he saw a poor movement of his players.

The latest mark flags the 1-1 goal of his team after 19:15 min.

During the match, whenever the coach sees another relevant picture or interesting situation/scene which he wants to discuss with his players later, he presses the corresponding button: [Mark new single picture] or [Mark new video sequence] …

Please press the [Mark new video sequence] button now …

Screen 2:
After pressing the [Mark new video sequence] button, the coach is asked to enter some more detailed information about this scene:

- The duration of the video sequence (here: 18 seconds)
- A classification for this scene
  (Select a value from a list of pre-defined classification values.)
- A short note, which describes what he sees in this situation

Press the [OK] button on the lower right hand side of the screen.
Screen 3:
After pressing the [OK] button a new record is shown on top of the “Marked Pictures / Video Sequences” area. Until the end of the game, the coach marks all other situations of the game he considers as important for his team and for later discussions. After the game (or even during the halftime break) he skips to the [Picture/Video view]

*Please press the [Picture/Video view] button on the upper right hand side of the screen.*

At the beginning, in screen 4 an empty football pitch is shown. Now the coach selects one of the situations (pictures or videos) he previously marked during the game. *Please choose the opponent’s first goal after 12:45 min.*

Please press the [Picture/Video view] button on the upper right hand side of the screen.

Screen 5:
In the following screen 5, the corresponding 12 sec video is shown, in which the coach can analyze together with his players, why this goal could be shot. He can play, interrupt, and re-play the scene again and again.

If an additional camera recording of the match exists, the coach can switch to the “TV camera view” (press the corresponding button on the lower right hand side to skip to Screen 6) and back to the bird’s eye view (Screen 7).

*Switch between Birds Eye View and TV camera*

Moreover, by clicking the [Show Metrics] button the distances between the players are shown (and the distance of the ball to our goal, which is also important for a good defense behavior) (see Screen 8).

In that way in a team meeting, the coach can discuss all relevant situations, he marked during the previous game.

Besides, the app gives him the opportunity to analyze several statistics. *Please press the [Statistics] button on the upper right hand side to skip to …*

… screen 9:
In this screen some offensive statistics are shown – for one single player (here: for Toni Kroos) or the whole team.

By clicking on a single value, the coach gets more detailed information to the corresponding parameter. *Please choose the 132 passes of Toni Kroos.*

For example, in screen 10 all the 132 passes of the player are shown in a single picture. The coach now can analyze where exactly the player usually passes, in which direction and over which distance.