

**Protocol:**

An interactive prototype has been made in Figma, password is "infovis":

<https://www.figma.com/proto/P2rXlt57iw03nweYa6wqjn/Untitled?node-id=3-3&starting-point-node-id=3%3A3&t=B2RiJR14A8ZX9kkB-1>

The participants were introduced with the following text, we set out to interfere as little as possible and let the participants figure it out on their own:

*The year is 2023, you are the football manager of Liverpool football club. Diogo Jota has been underperforming this season and you want to find a replacement player. Follow the tasks to find the best fitting replacement player:*

**Task list:**

1. A new player has come on your radar, use the radar graph to investigate whether replacing Jota with Roland is a good fit for your team and justify your choice.
2. You want to find an attacking player at your opponents who is better at passing the ball than Diogo Jota, use the scatter plot to find a better match.
3. You want an overview of the best players in the Premier League ages between 23 and 28. Use the heat map to obtain an overview of the best scoring players in this age range
4. You don't want the highest scoring player aged 23-28, but rather the player who created the most changes. Use the heat map to find the best change creator in this age range.

**Findings**

From the think aloud session we encountered a few interesting improvement points:

- We need to explain all terms used in the visualisation, as we are designers who all know something about football we have to look out for the bias of *curse of knowledge* and explain every attribute.
- Hover over elements should add explanation.
- Some elements need more indication that they contain interaction. Make interactive elements button-like and more intuitive to use
- Label all the axis and color code the positions

**Concrete suggestions:**

- Rather than filters for the scatter plot, make player positions (or other relevant information) differentiated by color first rather than filters.
- Attributes should have a clear legend/units (e.g. "passes complete" should really be "passes complete (%)")
- There is not a direct mapping between colors in the heatmap to performance, i.e. a darker color does not necessarily correspond to a more positive outcome in performance.
- Declutter the radar view by only differentiating the players you are looking at, the one(s) you want to compare him to

Notes:

## **PERSON 1**

### Task 1

First went to radar graph and investigated the players shown on the right side.

- needed some explanation on the colors and what they mean (team or not team)

Clearly understood the graph and what it means. Thought that Roland was a good replacement for Jota.

Examined the position of the player in the first page and thought it was good Roland is an attacking player

Worried that Jota is better at penalties (not sure if that changed the decision)

Thinks Roland is a good replacement, not totally sure

### Task 3

Asked if the completed passes was a number or a percentage

Thinks J. Alvarez, Haaland or Doku are good replacements

- didn't take the position of the players into account
- when given input he also examined the attacking scatterplot
- and when given extra input also examined the age graph

Was quite sure in his decision

### Task 4.

Tried clicking on goals scored (button not available in prototype)

Found his way around the heatmap easily

### Task 5.

Finally found a way to sort the table

Easily found the right player and was sure in his decision

- the number of goals "scared" him so he changed his mind from Nelson to A. Saint-Maximin

Liked how specific and useful the items were

Because the goals are so prevalent he thinks it shows a big measure of quality

- because that part looks more visually appealing than the cluttered heatmap
- liked the filters
- is wondering about the integration of the different views

## **PERSON 2**

- No football knowledge, has watched before

### Task 1

Thinks it is not a good replacement, you want someone better. You want someone who is better in general. Should work well with the rest of the team

Not clear to click on interceptions

Clicking on interceptions might change their decision making.

### Task 2

Realizes it's an attacking player after a note

Thought completed passes would be just better. Would pick Haaland because he is the best on the first screen. Did not use filters instinctively, after mentioning looked through it and selected haaland

### Task 3

Clicked on age group, clicked on goals/shots rather than goals. would pick toney as he made the most goals. When choosing changes, instantly knew he wanted to filter on created changes. Chose Nelson. When asked why she thought it was so high, wasn't clear why Nelson had such high numbers.

*I didn't understand the numbers on the heatmap. Wasn't clear how they relate to in game. Wasn't clear why 20 would have the same number as 1.62.*

Axis at the scatter plot wasn't clear it was percentual

Radargraph was confusing and not clear how to use. Wasn't clear why other players were included. Lower the opacity of the radar graph to

Substitutes were not clear

Wasn't instantly clear you could click on the team

Would be nice to color code all the positions so it is visually more clear

### PERSON 3

- little to no football knowledge

#### Task 1

Figured out the radargraph quickly and how to examine Roland's performance

Thinks Roland is better due to goals and passing

Figured out a way to switch out interceptions and still thinks Roland is better

#### Task 2

Tried hovering above the scatter points

Thinks Haaland is the better pick due to both statistics

Briefly used filters

#### Task 3

Figured out the filter for goals quickly

Picked Toney as the first player he saw in the sorted table

For created changes he first thought Nelson is the best pick

- then saw he is low on games and scoring which made him doubt his decision
- he then chose another player due to this doubt

Called all the graphs intuitive

Has no doubts about the scatterplot x and y axis

Said the model is more focused on attacking than defense

Would be nice to be able to select which columns to have in the heatmap

### PERSON 4

- no football knowledge or background

#### Task 1

Understood the starting page correctly

Needed some help understanding which players are playing or replacements in the radar graph

Because of goals he considers Roland a good replacement

He wasn't sure if when he clicks on interceptions if something else has changed as well

#### Task 2

Wasn't sure if the players on the plot are on the team or on the market

Figured out the filters intuitively and used them well

Picked Haaland as the replacement for his overall performance

#### Task 3

Found the age and filtered quickly

Wondered why the best person on scatterplot is not in the table

Wondered about other positions and if he should take them into account

Saw Toney but looked for other factors to see if he is a good fit

Wasn't happy about the fact that the players are different across tasks

#### Task 4

Had no problems with the changes created

- could not filter by goals after filtering changes

Didn't figure out that Nelson has a lot of changes created because of low amount of games

Didn't know that "games" meant games played

- after being heavily assisted he chose another player

Wants more explanation on what the column names mean

Why are things in the heatmap "good" or "bad" when they don't necessarily have to be

### PERSON 5

Sees formation → recognizes subs

Understands links to visualisations

Clicks on Jota in formation

Blue is Jota, Understands other are subs. → Understands clicking on Roland. Thinks it is an improvement due to goal/shot.

Understands clicking on interceptions will change it, thinks Roland is an improvement. Does not put the link that other players already cover the penalty aspect

Goes to scatter.

→ Filters on attackers,

→ Understands the axis properly, picks Haaland as the best replacement. Pretty clear how everything works

Goes to heatmap

→ Goes to filter instantly, wanted to click goals/shot to get the most clinical attacker

(Mitrovic). Goals/shot would be more interesting in selecting a player as it proves more how good a player is.

Sorts on created changes, didn't want to pick Nelson. Recognized it was not a good pick, due

to lack of red color. Wanted to pick saintmaximim because he had more red colors in the heatmap.

Radar graph was not clear which area belonged to which player.

Likes the idea of merging forms in radargraph would be nice per line of duty (attacking etc.)

## **PERSON 6**

- little football knowledge

### **Task 1**

Noticed on start page that Jota is a forward

Easily found his way around the radargraph

Wants to see all the players and the overlap

He's better for the goals so he picks Roland as replacement

Didn't realise he can change the interceptions (needed help)

- didn't know it was clickable
- When he clicks he expected to see penalties scored as a sub-category of goals scored

### **Task 2**

Went back to team first

Said that the filters are not really clear

- there could be a defensive player that is good at attacking

Picked Haaland in the end after filtering

### **Task 4**

Chose the right age range easily

Went with "the one on top" which was Toney

### **Task 5**

Found the sorting of the chances created

Said Nelson is not a good fit

- no passes, no goals shot