The RLCS Winter Major : A Team Behavioral Analysis

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1 The VataDiz Journey

1.1 Finding the content to base our analysis on

When our group first met, we all agreed that what we wanted for our project was telling a story that the user would relate to while still being able to slightly influence its direction. We were also interested in analyzing the data so that our visualizations would do more than simply translate visually what was known data-wise. When we came across the RLCS 21-22 dataset we were astonished by all the data at hand, without mentioning that willing to, we could use the replay files from ballchasing.com to create our own interesting features for custom visualisations and augment the range of possibilities we already had.

1.2 From simple data to a story worth telling

Now that we found the data, we needed to extract a story out of it. Because Rocket League is such a fast-paced game, the decision to study aggressiveness in the sense of risk-taking came rather quickly. On top of that, we thought there may be interesting parallels to draw with traditional sports such as football or hockey for further work. We decided it would be interesting to study teams' behavioral adaptation, i.e. to visualize how teams changed their game style based on different scenarios. Basically, our story would be about putting itself in the team shoes in order to experience their side of the story. We extracted 3 main axis for our study which would allow the user to get a grasp of what is happening from different perspectives : the tournament context (groups vs playoffs stage), the general ranking context (favorite vs challenger scenario) and the ongoing match context (do teams adapt their play style in-between games of a given match?). This was perfect as our website would thus be able follow the natural top-to-bottom flow outlined by our 3 axis approach. As such, we came up rather quickly with the global website design : the user should be able to climb down so that they would start with a global, general perspective and end up with a fine-grained analysis of a single 5 minutes game.

1.3 A good story requires a good storyteller

The general idea in mind, we started thinking about what was interesting to show, how we would show it to the user and what influence the user could have on our story. Here we faced two paths to choose from :

1. visualize each feature related to risk-taking separately or combined with up to 3 other features, or

2. create a way to combine all the features we deemed useful in an arbitrary fashion so that the user would then be able to play with it and make their own changes.

Option 1 was the one we picked in Milestone 1 and it seemed nice because it allowed us to visualize a variety of different features, however it wasn't sure whether we would be able to draw conclusions or make links between the features. And choosing this path would reduce the impact the user could have on our story. And so we picked the second path.

We first handpicked all the relevant features and then decided to make a risk-taking metric out of it, based on our knowledge of the game and its internal mechanics. This approach allowed a natural way for the user to create its own story derived from ours : we could let them interact with our metric so that willing to, they would be able to tell a totally different story (but possibly not representative of the reality) for a given team, basically answering the "What if teams gave more importance to this aspect of the game?" question. We drew several designs, as shown in the second milestone, and thought about how we wanted to share our findings. It made sense for our website to have 3 main core features : a team chooser so that the user could compare each team's story, a timeline for each of these team, going from "every match they played in the tournament" to "every game they played in one match" to finally "a single game", and finally an interactive depiction of our risk-taking metric for each level of analysis. This way we could design separately what we want to show for each level. The higher level would feature general statistics and visuals for a given team, the mid level would feature a brief summary of each team current state as well as comparisons between the two for a given match and the lower level would give the specifics of a given game from the selected match-up.

At this point, we had our general design ideas for both the website and its content, great! Now, all that remained to do was turning our ideas into reality.

1.4 Implementing our ideas

The implementation part was probably the most difficult one as we didn't want to use a template for our website but rather create our own customised display so that the website serves our ideas and not the other way around. This means we needed to build our webapp from scratch and arrange the various layouts and

everything by ourselves. So we did so. The task revealed itself more complicated than anticipated, and as such we had to drop all the visualization ideas that would make use of the replay files such as time series or heatmaps as they required a lot of processing we didn't account for. This is the main regret we have about our project because heatmaps were the perfect visualization for our analysis type and it fit perfectly the game's context. Time series would also have been great as they would have allow for an infinitely more fine-grained analysis. But at least we had our metric that generalised pretty well and a way for the user to interact with it.

2 Visualisations design

2.1 Team Chooser

The very first prototype of our website featured a really simple widget as our team chooser: a drop-down menu where the user could select a team from. There were no images or visual cue other than text for the team names. In the e-sport scene, but more generally in any sport, the logo of a team matters a lot, indeed they showcase the team and set the direction for the team's visual identity. An iconic logo mark minds. Following-up on this observation, we instead decided to show each team's logo and the user would simply need to click on one to select the team. This was also a good idea because it would allow users unaware of the game and/or its e-sport scene to pick a team based on their visual identity, which is more pleasant than simply with its name. Finally, we realised that there was no clear visual cue for the user to see what team they picked. To fix that, we made all logos black and white, as well as slightly blurred. Hovering over a logo would make it appear clearer, slightly bigger and colored. Sectioning one would keep these changes permanent.

2.2 Risk-taking metric

The risk-taking metric is at the core of our project. We thought about various possible implementations for it but we wanted to keep it simple so that it would be intuitive enough for the user to interact with it easily. This is why we chose a linear model for our metric, this way we could assign an "importance" coefficient to each feature (which are normalised) and the user would be able to easily augment or reduce the impact of a feature by simply changing its coefficient with the help of a slider. The user changes would then be propagated to any component of our website that used the metric. By playing with the coefficients, the user can also decide to show only the effect of only one feature.

2.3 User journey

When the user first arrive on our website, a text box briefly explaining our project and defining our metric pops up. The text box includes an interactive widget used to customise the metric as they wish. By default, it is set on what

we deemed to be the most accurate metric based on the features we selected. Once the choice for the metric is set, the user can now access the visualization : here they can either select a team to start the journey or change their mind about their coefficients and change the metric by clicking on the bottom right settings circle. Note that they can click on this circle to change the metric at any point during their discovery of the website.

Once a team is selected, its logo is highlighted and the user can finally start looking at what we wanted to share with them. On the left they can see a stacked area chart which allow them to quickly estimate for each match how much impact a given feature has, as well as showing the overall risk-taking score, allowing for a quick comparison between matches. On the right hand-side, the user can hover over the logo to get a short description about the organisation behind the team. They can also see the team name, their regional ranking (defined by the amount of points they acquired during the winter split, prior the the Major), a short summary of their tournament as well as a few core in-game stats.

Finally, selecting a match (by clicking on the circle containing their opponent's logo) allow the user to scroll further down, to see more details about a given match, with a timeline showing each individual game as well as the team's risk-taking score for it. They can also find the players of each team there. There, the user should have been able to select a single game and have more in-depth statistics and visual information about it but we couldn't implement it due to time constraints.

3 Challenges

3.1 Framework choices

We needed a tool to model the main (and only) page of our website. This turned out to be way more annoying than expected as React and D3 both are frameworks that use the document object model, this means we struggled quite a bit to understand when to use React and when to use D3. We also struggled when dealing with the page updates to avoid double displays i.e. the website would add items on top of each other instead of replacing them.
In the end, we ended up using React to manipulate the layouts as well as the interactions between the website components. D3 was instead used for everything related with the plots interactions.

3.2 One-page webapp to fit it all

One wish we had for our project was that everything should be readily available, i.e., no need for tabs or redirection between different sections of our website. We wanted the flow of the visualisation to be smooth and feel natural. This is what constrained us on the layout choices we made. This is also the reason we

decided to use tooltips for the information we thought was cool to know but not necessarily important for the sake of the story we wanted to tell. This is also the reason why we decided to use integrated dialog boxes as well, for instance for the metric definition. Finally, because we created the website architecture to specifically fit our top-down approach, the most difficult part about it was organizing correctly the panel next to the stacked chart.

4 Peer Assessment

- Matthieu : Major code contributor (mainly d3js and TeamChooser but touched to everything), Design of the project concept, Design of the website
- Kevin : Minor code contributor (a few visualisations that simply needed a placeholder), Design of the project concept, Design of the metric and its utilisation, Design of the website, Process Book
- Thomas : Major code contributor (mainly UX design, structure of the website and implementation of the risk metric interactivity for the user), Design of the project concept (author of the 3-axis approach), Design of the website