

Mobility & Opportunity Trends in the NFL

A CASE STUDY



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Introduction



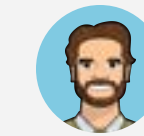
The NFL releases an annual study on diversity, equity, and inclusion, led by Dr. C. Keith Harrison from the University of Central Florida. Dr. Harrison and his team examine what barriers ethnic minorities face in regards to occupational access and mobility in the NFL. Their analysis includes roles for head coaches, general managers, offensive coordinators, and defensive coordinators (“NFL Diversity,” 2023). Through the results of this study, the NFL seeks to identify practical solutions to any barriers that do exist, while continuing to make progress toward normalizing opportunities for all people, regardless of ethnic background.

In addition to continuing this study in 2023, the NFL sought the help of Playfair Data to leverage the power of data visualization to spread the impact of the report to an even wider audience. Data visualization in the form of a report or dashboard can be a powerful and engaging way to communicate information. By limiting text and focusing on visuals, viewers’ time to insight is shortened. A dashboard can also more effectively communicate with users with short attention spans or limited time by condensing data to visuals, therefore reaching an audience that might otherwise be missed.

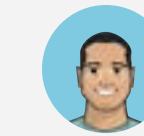
Greater public awareness has the potential to have a positive impact on the progress of Diversity, Equity, and Inclusion (“DE&I”) initiatives such as this one. The greater the awareness for normalizing opportunities for all people, the faster this normalization will spread and take hold. This phenomenon is highlighted by Everett Rogers in his book, Diffusion of Innovations, in which he examines how new behaviors can rapidly spread once a critical mass of people have adopted the behavior (“Social Marketing,” n.d.). The team at Playfair Data wanted to leverage our expertise in data visualization and information design to help the NFL achieve their goal of increasing the positive impact of the current study on occupational access and mobility.

The Team

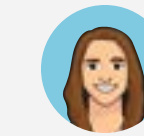
Design



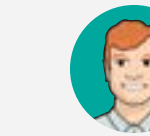
Rafael
Simancas



Luke
Lewis



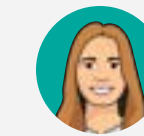
Alyssa
Huff



Dan
Bunker

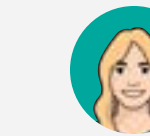
Tableau Engineering

Data Engineering



Maddie
Dierkes

Quality Assurance (QA)



Megan
Spengler

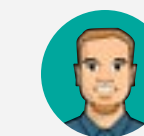
Visual Analytics Strategy



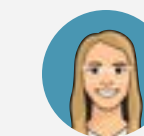
Ryan
Sleeper



Jason
Penrod



Ethan
Lang



Ariana
Cukier



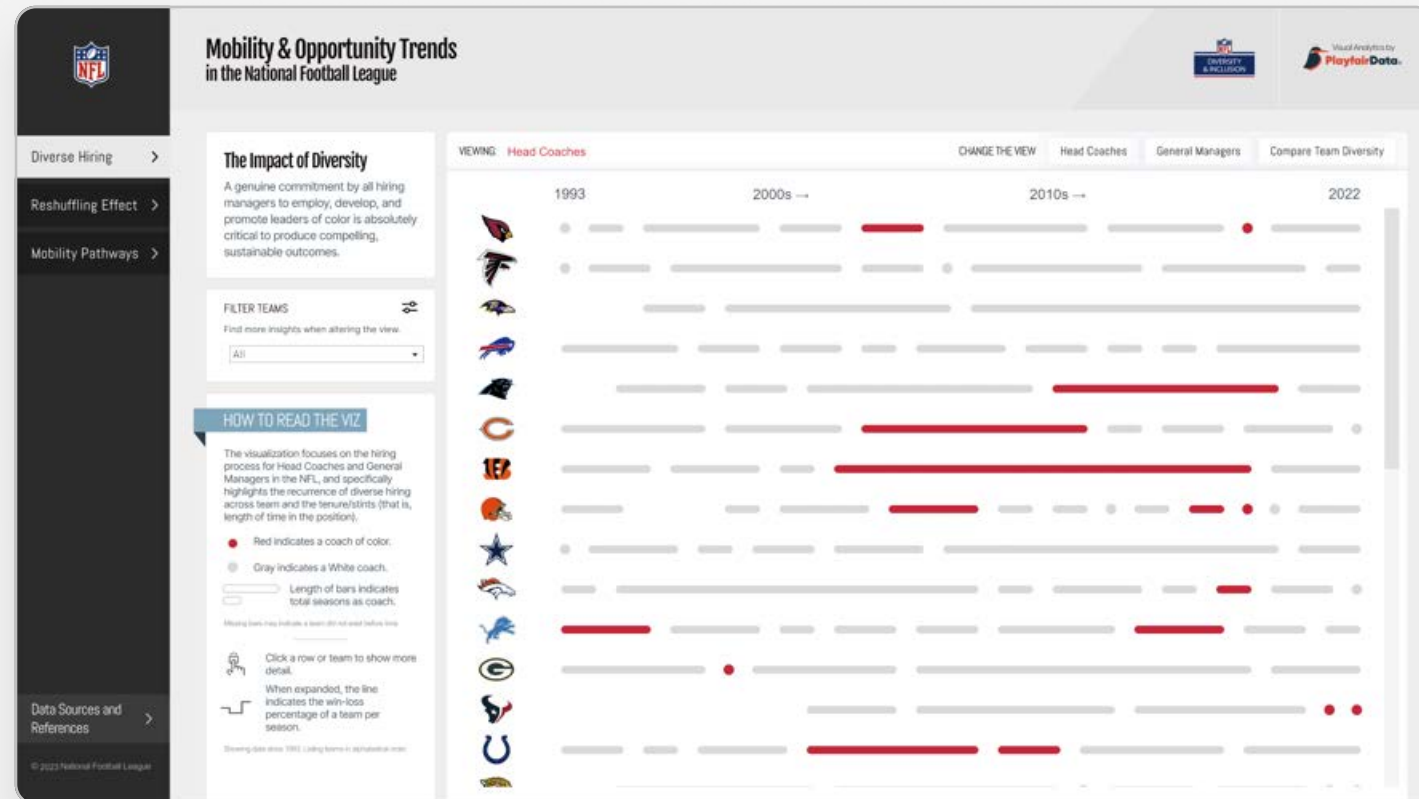
FINAL PRODUCT

Mobility & Opportunity Trends

in the National Football League

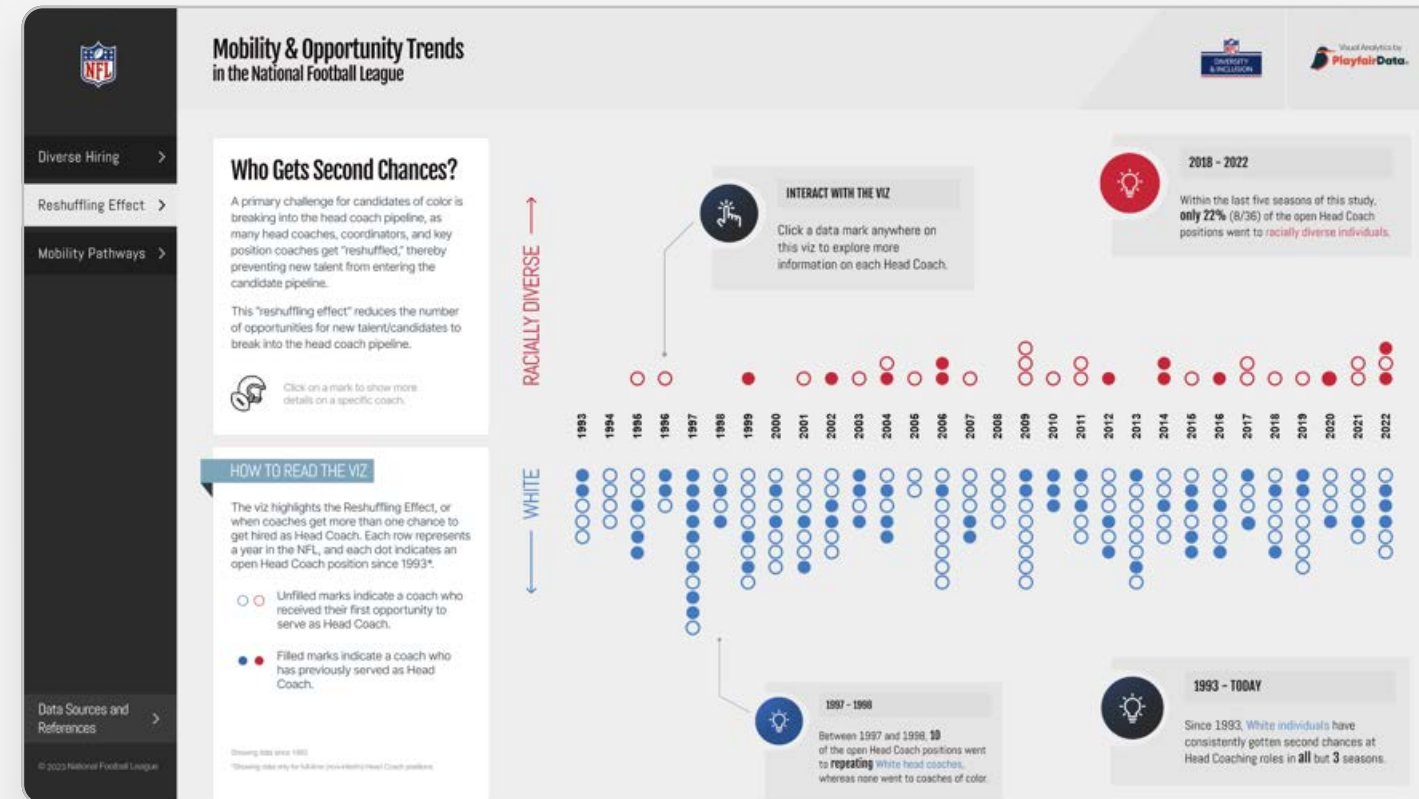
An interactive dashboard report that visualizes the hiring trends of coaches in the NFL across the years, where race and performance are contrasted to find bias patterns behind the scenes.

[Explore the Mobility & Opportunity Trends Dashboard](#)



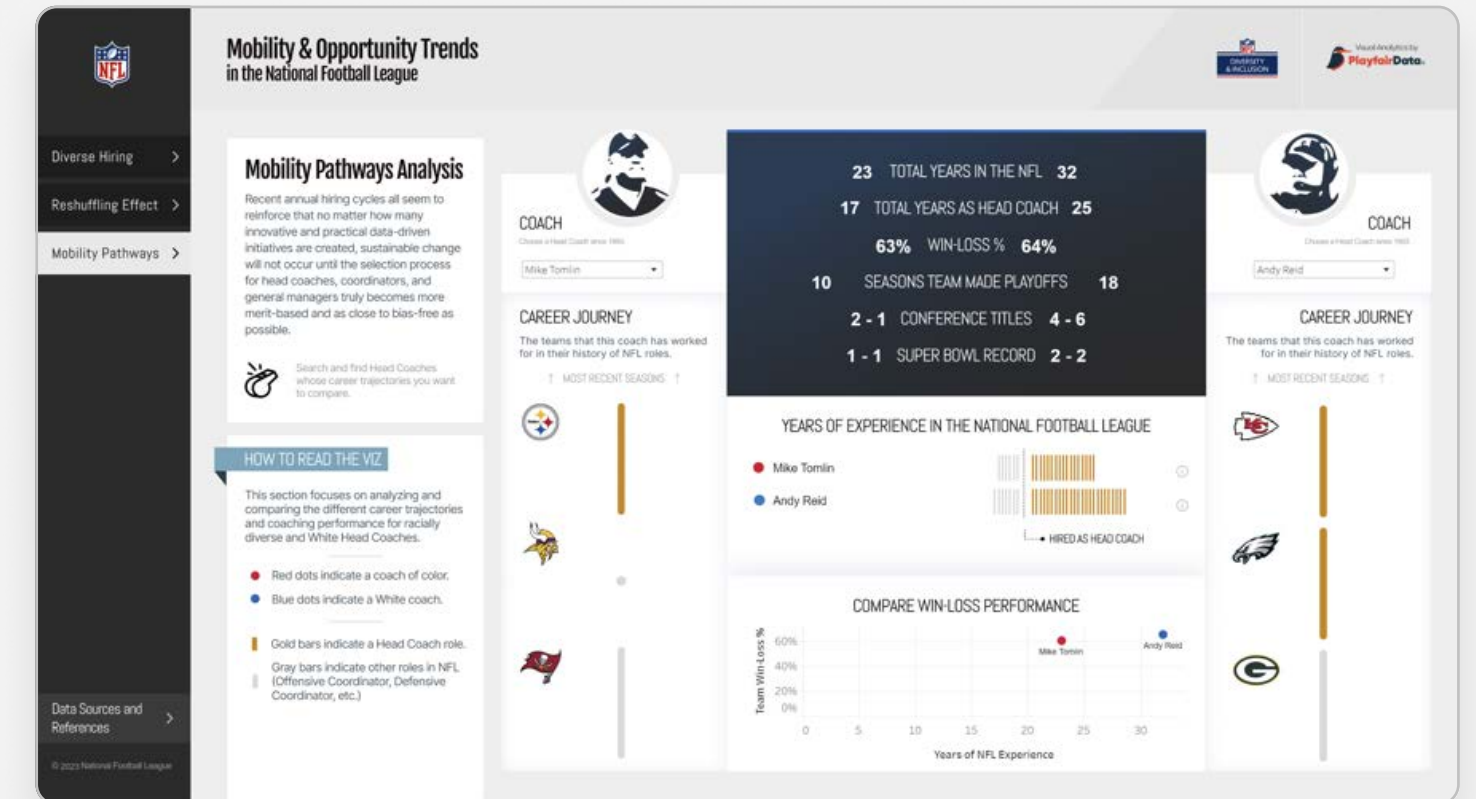
DIVERSE HIRING

In this tab, explore the hiring trends for the different pro football teams and the recurrence of hiring shake ups, tenures, and performance metrics.



RESHUFFLING EFFECT

In this tab, see the opportunities for candidates to break into the Head Coach pipeline and the cadence of repeated role coverage.



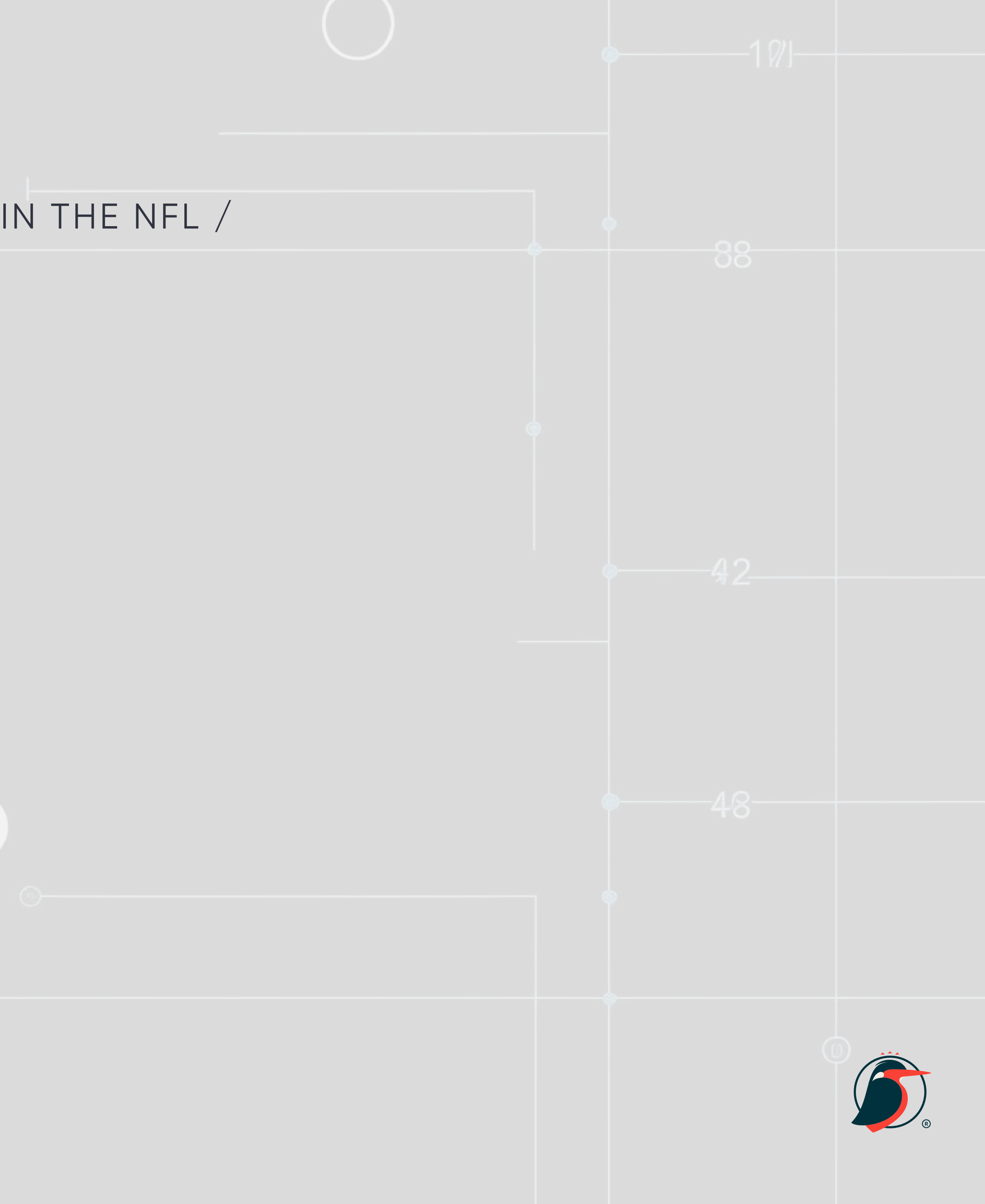
MOBILITY PATHWAYS

In this tab, study and contrast historical Head Coaches in their career trajectory.



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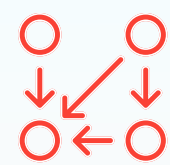
The Challenge



Once we gathered the background information and requirements, we set about laying out the problems we aimed to solve with our report. We wanted to design and build a tool that achieved the following:

- Spur action to create a more inclusive hiring process for people of color and women.
- Visualize the data in a way that's consumable, immersive, and intuitive.
- Highlight the human element – real people are and will be impacted by the NFL's diversity, equity, and inclusion initiatives.

Let's take a deeper look at each of these goals. First, in order to spur action to create a more inclusive hiring process for general managers (GMs) and coaches, we wanted to demonstrate how the data show that people of color and women are not given the same opportunity as their white peers, even when they have similar or even better resumes. Now to change this pattern, we have to understand why it occurs.



Spur Action



Consumable,
Immersive,
& Intuitive



Highlight the
Human Element

The most likely reason is implicit bias, which the NIH defines as “a form of bias that occurs automatically and unintentionally, that nevertheless affects judgments, decisions, and behaviors” (“Implicit Bias,” n.d.). Furthermore, based on a test developed to measure implicit bias by social psychologist Dr. Anthony Greenwald of the University of Washington, implicit bias “involving black-white race, shows up in about 70 percent to 75 percent of all Americans who try the test” (Mason, 2020). These findings suggest that some of the hiring decisions for GMs and coaches could have been impacted by bias, without the decision-makers even being aware that they held that bias in the first place. So how do we change biases that people are unaware they even have?

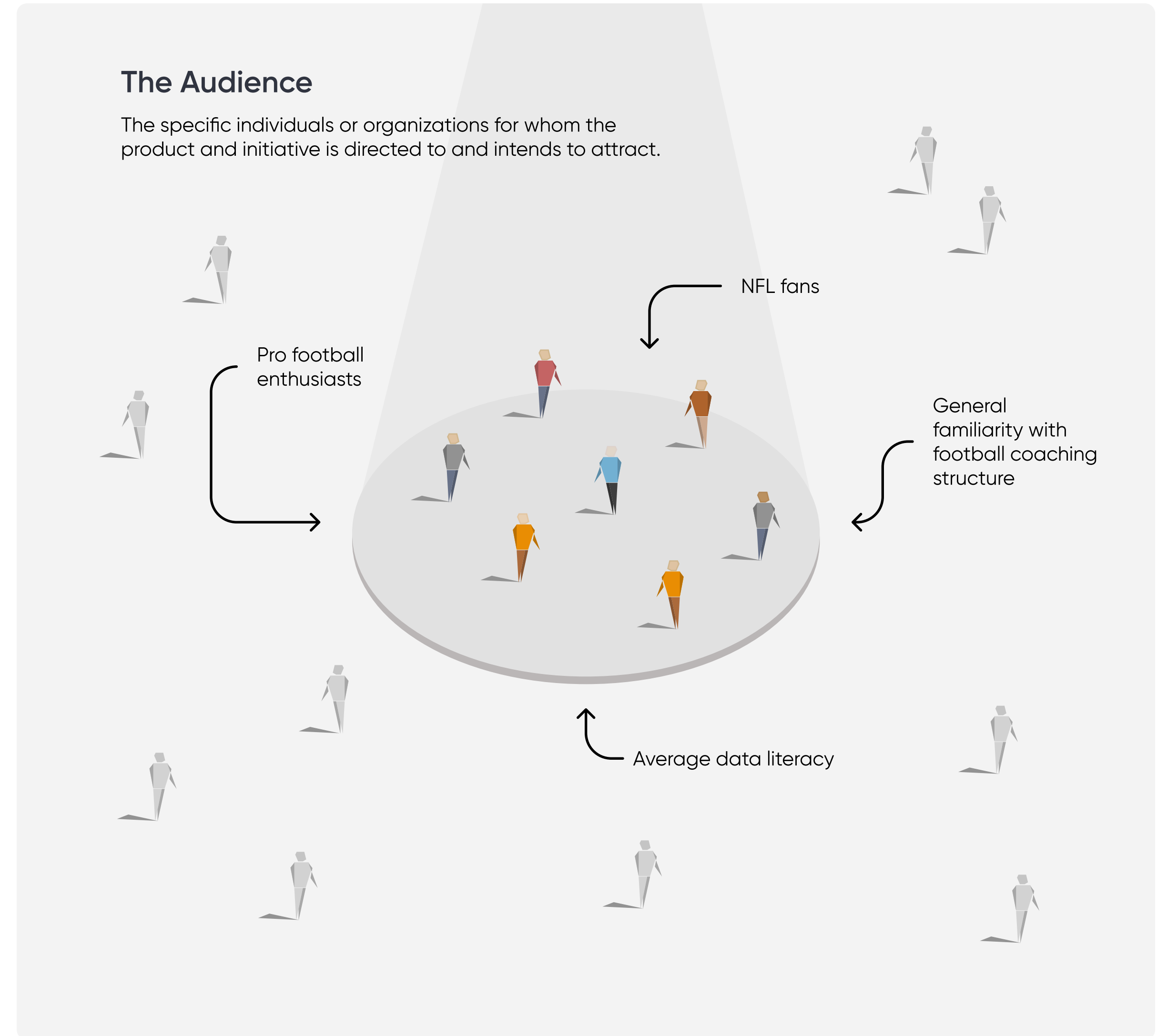
70% - 75%

Implicit bias “involving black-white race, shows up in about 70 percent to 75 percent of all Americans who try the test”.

The good news, according to Dr. Greenwald, is that there are things we can do to combat implicit bias. First, “a lot can be achieved just by collecting data to document disparities that are occurring as a result of bias” (Mason, 2020). Second, we can apply thorough, objective criteria for decision making that can help eliminate decisions made based on subjective criteria. And third, we can utilize de-biasing techniques to help people unlearn implicit biases. With our report, we focus on the first of these actions: collecting and documenting data.

Next, we wanted to create a report that was consumable, immersive, and intuitive. Data visualization and design best practices were the foundation for our decision making for our vision of the report. The first piece of this puzzle was to determine the story we want to tell with the data. Without a story or a purpose, we cannot engage the audience, and any insight that could be gained from the data will be lost. We decided to start with the most broad data, at the team and role level, and drill down into the individual level from there. In other words, we wanted to show the broad trends happening with occupational mobility within the NFL, and then dive deeper into who was impacted by these trends.

The next piece of the puzzle was to consider our audience. Who are they? What relationship to or knowledge of the data or coaches do they have? What is their level of data literacy? We determined that the audience for the report would likely be NFL fans with general familiarity with the data and the coaches, and about average data literacy. By average data literacy, we mean users who are familiar with typical visuals, such as line and bar charts, but have less exposure to more advanced or complicated visuals, such as a treemap or Pareto chart. For this reason, we wanted to stick with fewer, high-impact visualizations, so that each part of the story was simple and straightforward, but powerful.





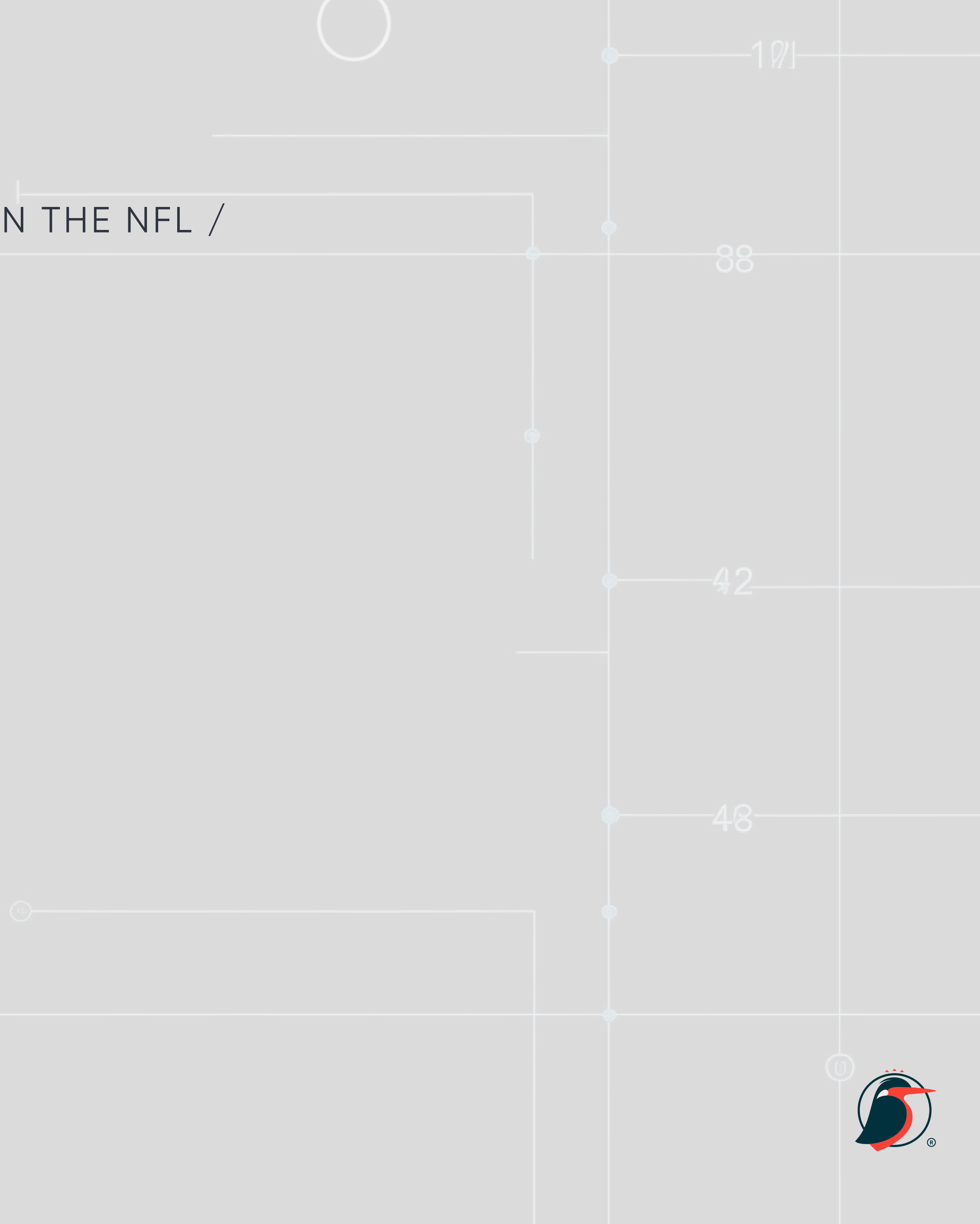
The final piece of the puzzle was to always keep in mind the foundations of data visualization best practices. This includes limiting clutter, ensuring context is included where appropriate, testing typography and colors for accessibility, and conveying data in an accurate manner that does not mislead the audience.

“ “[C]ompassion fade’ and ‘psychic numbing’ explain how the brain responds to numbers that have no human connection. ‘If readers don’t relate to the information, they are less likely to act and use it,’ said Slovic”.

Finally, we wanted to go beyond just showing the numbers and highlight the human element behind the data. “Psychologist Paul Slovic uses the terms ‘compassion fade’ and ‘psychic numbing’ to explain how the brain responds to numbers that have no human connection. ‘If readers don’t relate to the information, they are less likely to act and use it,’ said Slovic” (Ricchiardi, n.d.). So how do you highlight the human element? The key for our team was to take the data all the way down to the individual level. Instead of aggregating data at the head coach, GM, race, or team level, we included a view that highlighted the data related to individual coaches’ careers. We wanted viewers to connect the data with a person, and likely a person that they have heard of or seen on TV while watching a game. From there, it’s much easier to empathize with coaches whose resumes show that they are great coaches, but who haven’t been given the opportunity to fill a head coaching position.

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The Solution



Now that the foundation for our report is laid, we can get into the details of the creation of the report. We knew from the start that we wanted to build our report using Tableau due to its capabilities for customization and interactivity, plus our team’s expertise with the tool. The entire team consisted of a strategist, data engineers, Tableau engineers, and information designers. On the matter of scope, we decided to focus on people of color, and the roles of GM, HC, OC, and DC in this phase. Additionally, we limited the timeframe to 1993 through 2023.

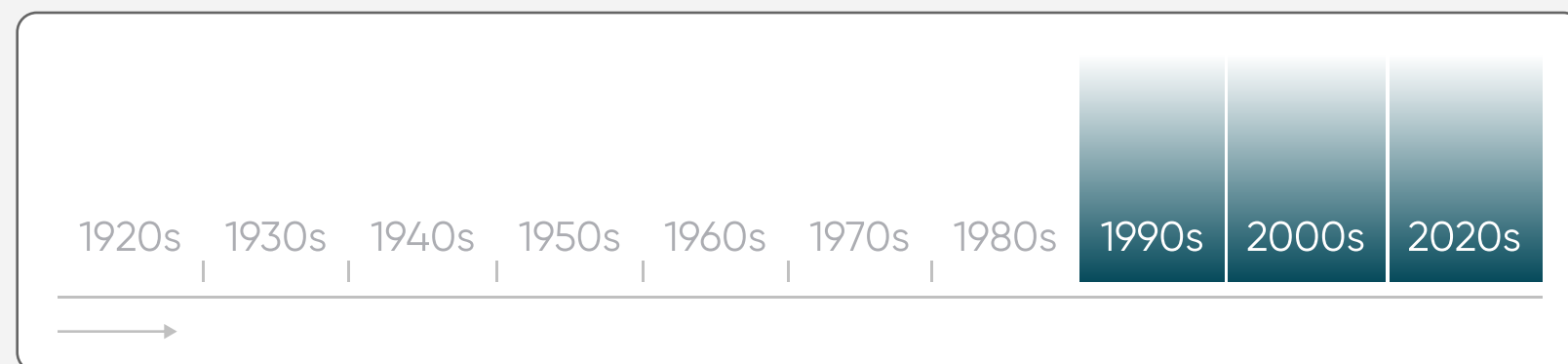
For our data, we used data from the NFL, which included the race of each coach (note that race data is self-reported by each coach). The majority of the data were pulled from profootballreference.com, which is a treasure trove of historical data on many facets of the NFL, from player stats to team performance to coaching resumes. Data for each coach were in individual tables, and each coach was on his own web page. To gather this data in an efficient manner, we used Python scripting to pull the appropriate table for each of the coaches we wanted to include in our dataset.

Narrowing the Scope of the Data

How we narrowed the scope of the data to better achieve the goals of the report.

Limiting the Timeframe

We looked at data from NFL games played from 1993 to 2023. While there are records dating back to the 1920s, the data is incomplete and inconsistent, so we chose to focus on a smaller set of data that is more reliable and relevant to our audience.



Condensing Roles for Analysis

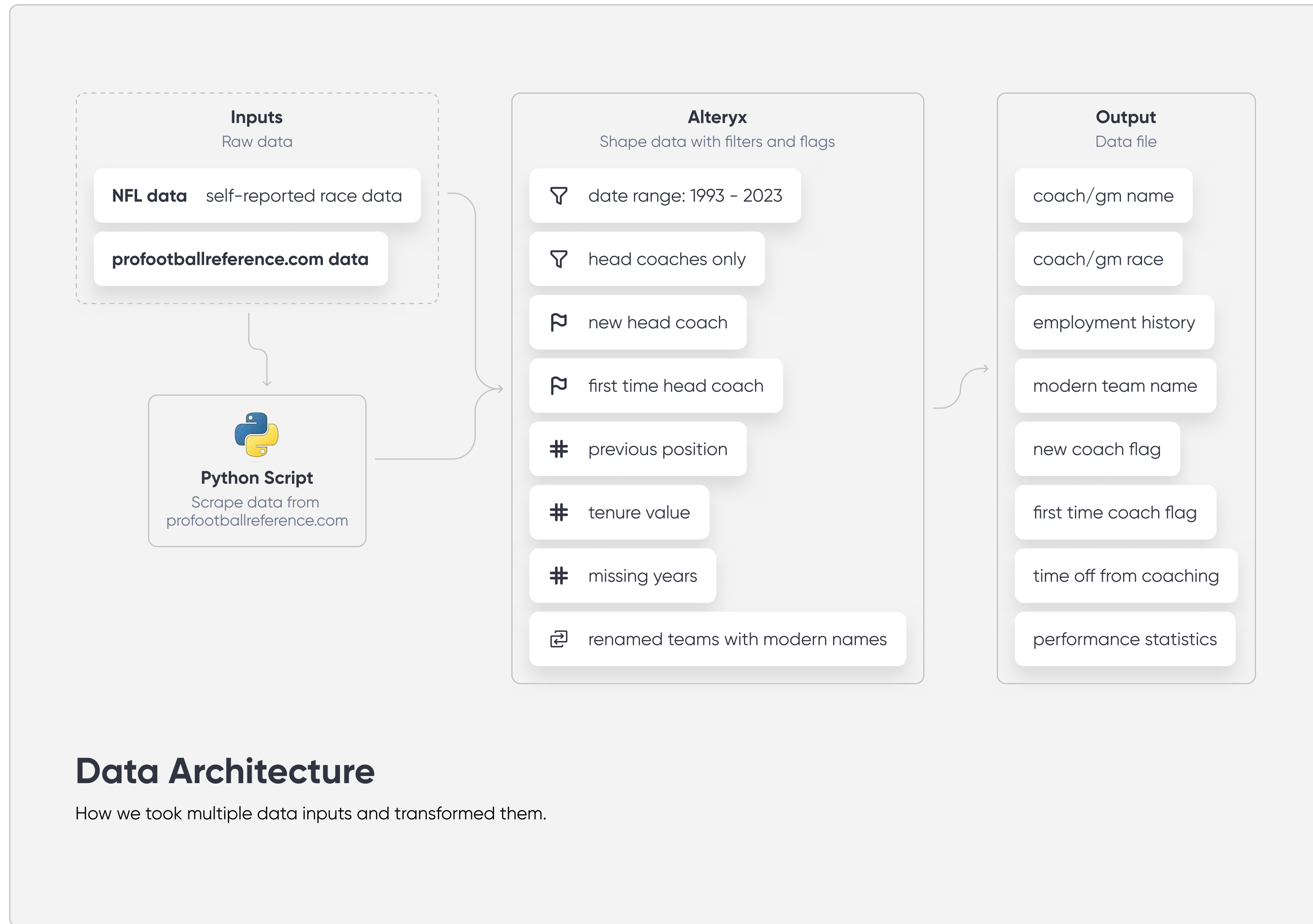
We focused on GMs, HCs, DCs, and OCs in our analysis.



The Final Scope of the Data

Summary statistics of our dataset.





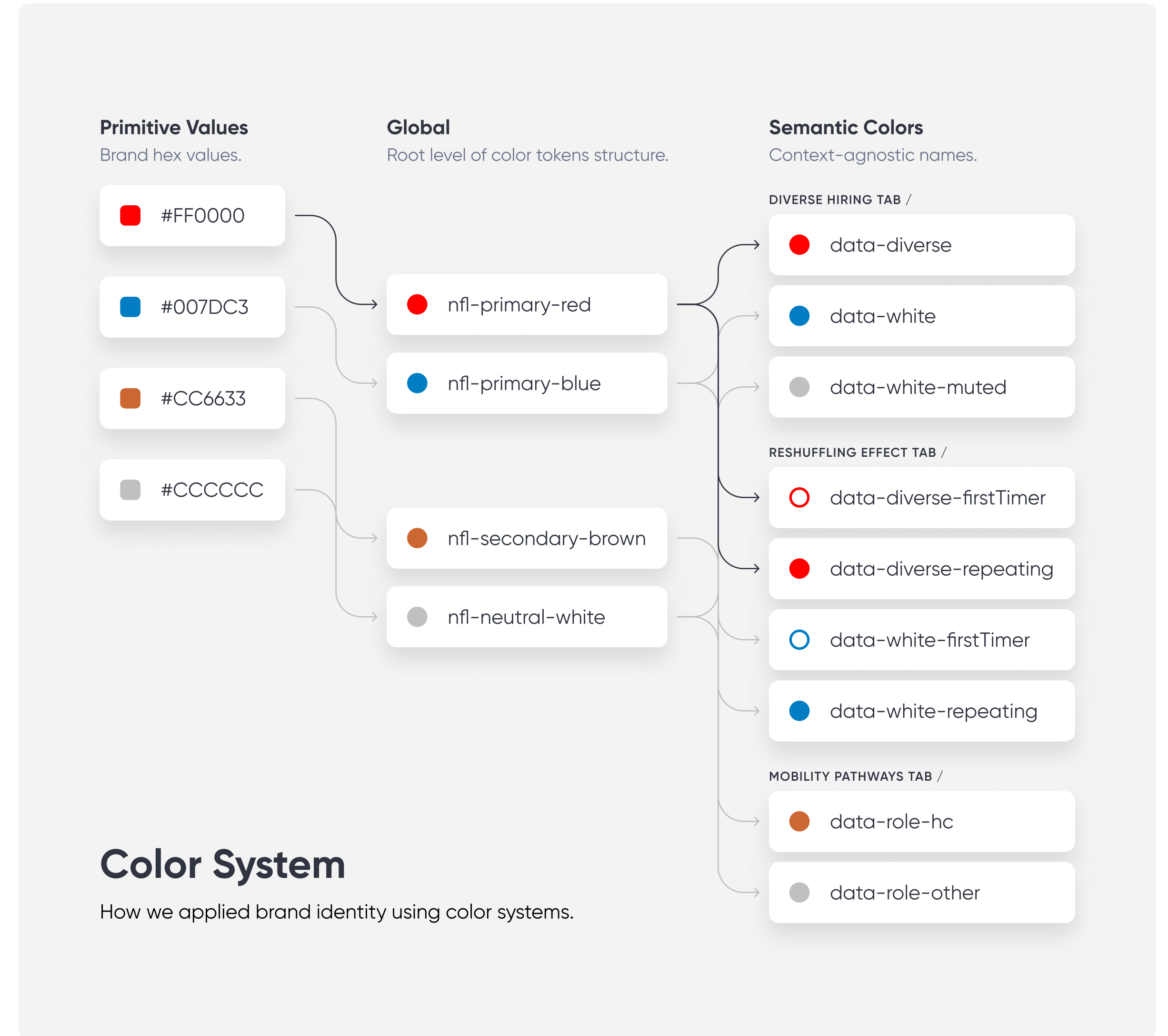
Next, our data engineers used Alteryx to shape the data for our report. The data scraped from profootballreference.com was filtered to just coaches that had been a head coach at some point in their career. We added a flag to show when a new person filled the head coach role in order to understand turnover and who was filling open positions. We also added a designation for individuals' previous position, tenure, and any missing years to track a coach's career trajectory (and if they took time off from coaching). First time coaches were also flagged to add to the story related to tenure and turnover. We incorporated the NFL data with the scraped data by using it to indicate which GMs and head coaches were people of color and which were white. We renamed teams to modern team names to track their historical data (e.g. the Oakland Raiders became the Las Vegas Raiders in 2020). Finally, we joined the coaching stats, such as wins, losses, and playoff appearances, to create the final table.

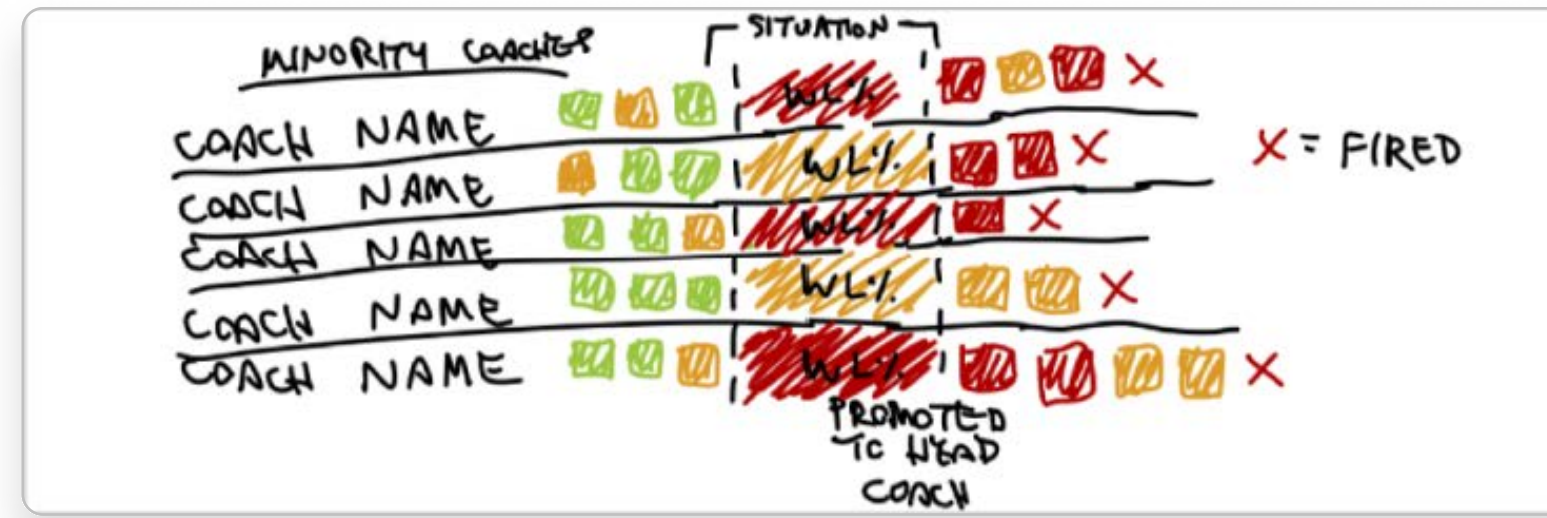
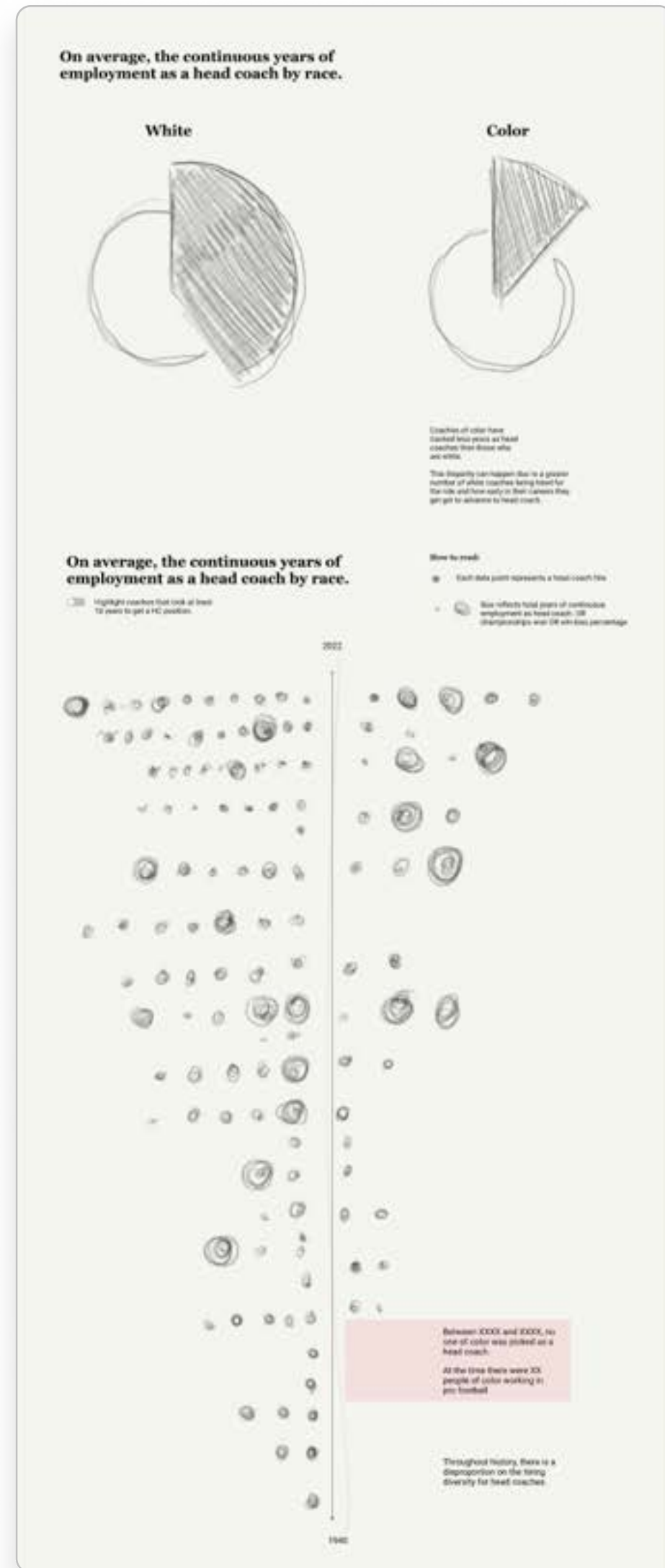


For the design, we created a task force of three designers who all collaborated at each phase of the process. We began with discovery, which included reviewing the report generated by Dr. Harrison and his team; gathering any relevant brand guidelines (typography, colors, logos, etc.); researching other reports related to professional sports and/or diversity, equity, and inclusion; and finally assessing the data that would be available to create the visualizations.

With the input of the strategist, data engineers, and the Tableau engineers, we put together a list of questions and statements we wanted to ensure were answered by the visualizations we ultimately included in the report. This was vital to shaping the story our report was going to tell, and helped ensure that the visuals were cohesive and did not leave out any important part of the story. Some of these questions/statements included:

- ➔ I want to understand the correlation between coaching hires and their win-loss records, and their years of NFL experience.
- ➔ I want to understand the opportunities that different ethnic groups are getting and find patterns.
- ➔ I want to compare the career timelines of different coaches.
- ➔ I want to see, among a cohort of Head Coaches, how many of them have been head coaches before and how many have not.





From here, each of the designers separately created visualizations that would answer each of the questions or statements. We then met and walked through the visualizations, and narrowed down the list to the designs we felt best answered the questions and statements used to create the story. Our next task was to combine these designs into a single, cohesive report. Each designer created their own version of the report in a different format: one design was a single-page, longform style, one was a two-page modern style, and one was a two-page traditional style report. Subsequently, we gathered feedback from the data and Tableau engineers to ensure that all of the visualizations and interactivity we proposed were feasible in Tableau.



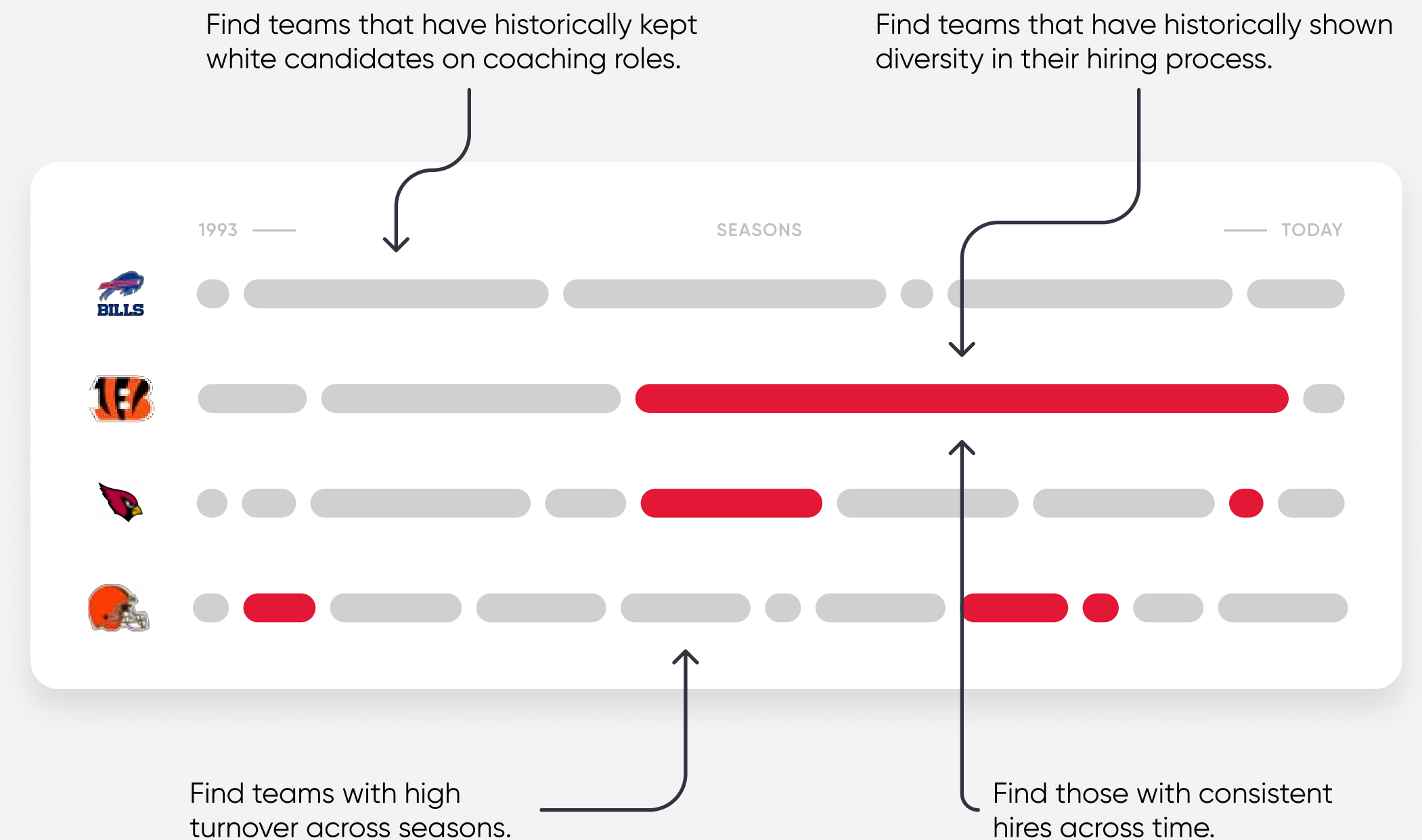
At this point, we presented the client with the designs and gathered their input and feedback. As a result, we actually simplified the report by removing some of the smaller, supporting visualizations, and emphasizing the high-impact visualizations. We also reworked the report format from either one or two-page options to three pages. This allowed us to take the viewer on a journey from the most broad data to the most specific data. That is, we started with head coach and GM roles by race at the team level, then drilled further to first-time and repeat hiring at the head coach level, and finally showed coaching career journeys for head coaches, defensive coordinators, and offensive coordinators.

With the client's approval, we began engineering the report in Tableau. The first page of the report, on diverse hiring, features an innovation the Playfair team developed during the course of this project, called a Pilula Chart. **The Pilula chart** utilizes pills of different lengths along with color coding to show that while some progress has been made in hiring GMs and head coaches of color across various NFL teams, the majority of GM and coaching roles have been held by white candidates since 1993.



Anatomy of Pilula Charts

This visualization focuses on the hiring process for Head Coaches and General Managers in the NFL. It specifically highlights the recurrence of diverse hiring across pro football teams and the length of their employment.



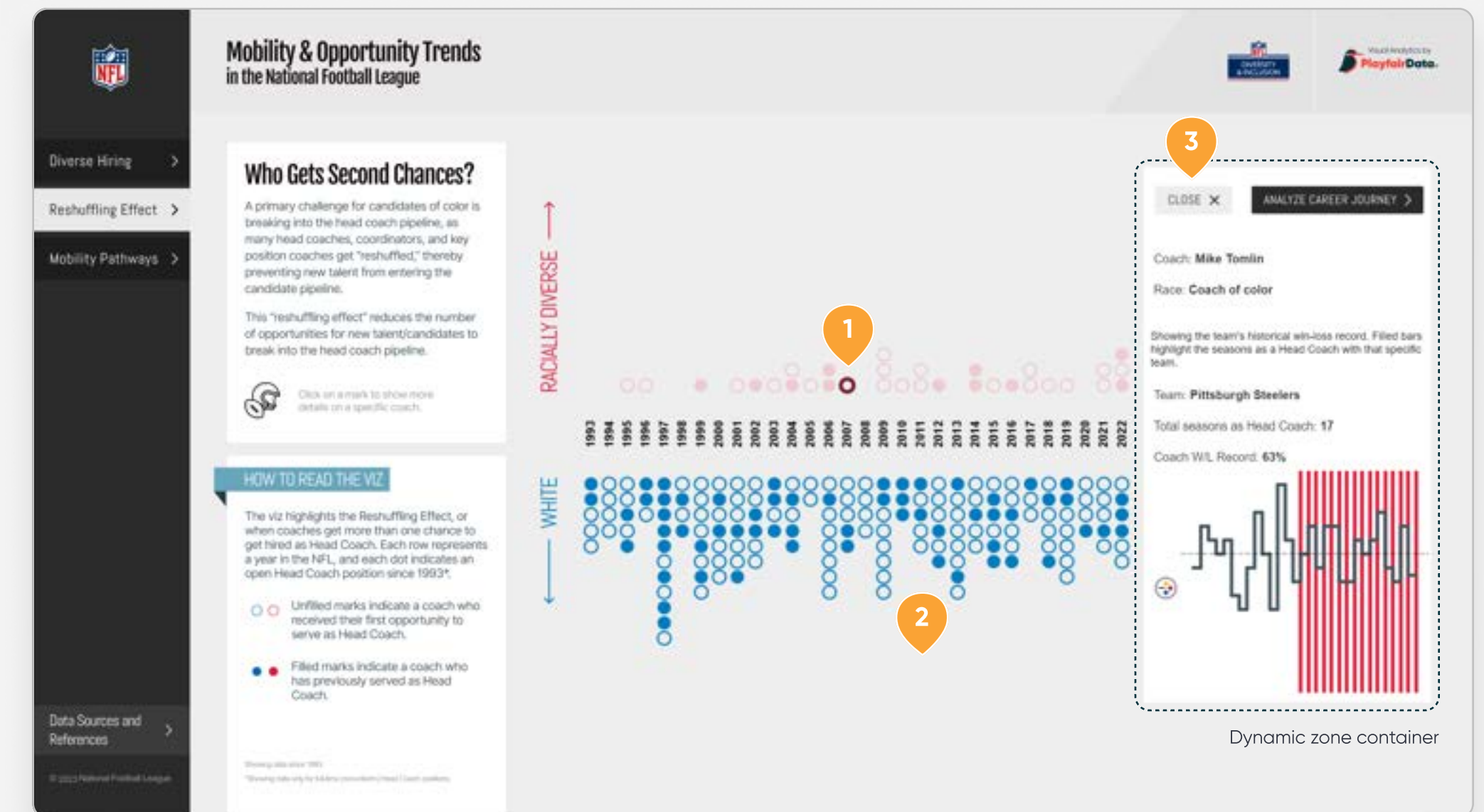
*Values visualized here are mere approximations for illustrative purposes.



Throughout the report, we also capitalized on a new Tableau feature called Dynamic Zone Visibility. This feature allows different objects or zones to be shown based on the way the end user interacts with the report. An example of this appears on page two of the report, called Reshuffling Effect. Upon opening, the user is greeted with a diverging unit chart along with custom annotations. Each point on the diverging unit chart represents a head coach that was hired during a particular year, with head coaches of color along the top in red, and white coaches below in blue. Combined, these visuals demonstrate what is called the “reshuffling effect,” wherein white head coaching candidates are given second or even third chances to act as a head coach, while candidates of color are generally only given one chance at a head coaching role. The custom annotations highlight insights or important dates along the reshuffling effect timeline. The use of Dynamic Zone Visibility comes in when a user clicks on one of the points in the diverging unit chart. This will hide the custom annotations, and shift the diverging unit charts to the left so that a slide-out panel with more details on the coach, the number of seasons they held the role, their win/loss record, and a history of the team’s win/loss record.

Dynamic Zone Visibility in Action

In the case of the Reshuffling Effect dashboard, there are three objects that are associated with the annotation/slide-out visibility:



- 1 **Top unit chart sheet:** Clicking on any mark will result in the annotations being hidden and the slide-out appearing.
- 2 **Bottom unit chart sheet:** Again, clicking on any mark will result in the annotations being hidden and the slide-out appearing.
- 3 **Close button sheet:** Clicking this button will close the slide-out and cause the annotations to reappear on the view.

Dynamic Zone Visibility Basics

Released with version 2022.3, any object or “zone” on a dashboard can be controlled with Dynamic Zone Visibility.

- ➔ Apply to images, individual sheets, navigation objects, or containers.
- ➔ Control with a field or a parameter, which must be Boolean, single value, and/or independent of a visual.
- ➔ Parameters can be used in conjunction with dashboard parameter actions to control an object’s visibility on the view.
- ➔ Fields can be used if a view is only relevant for a certain user group or category of data.



MOBILITY & OPPORTUNITY TRENDS

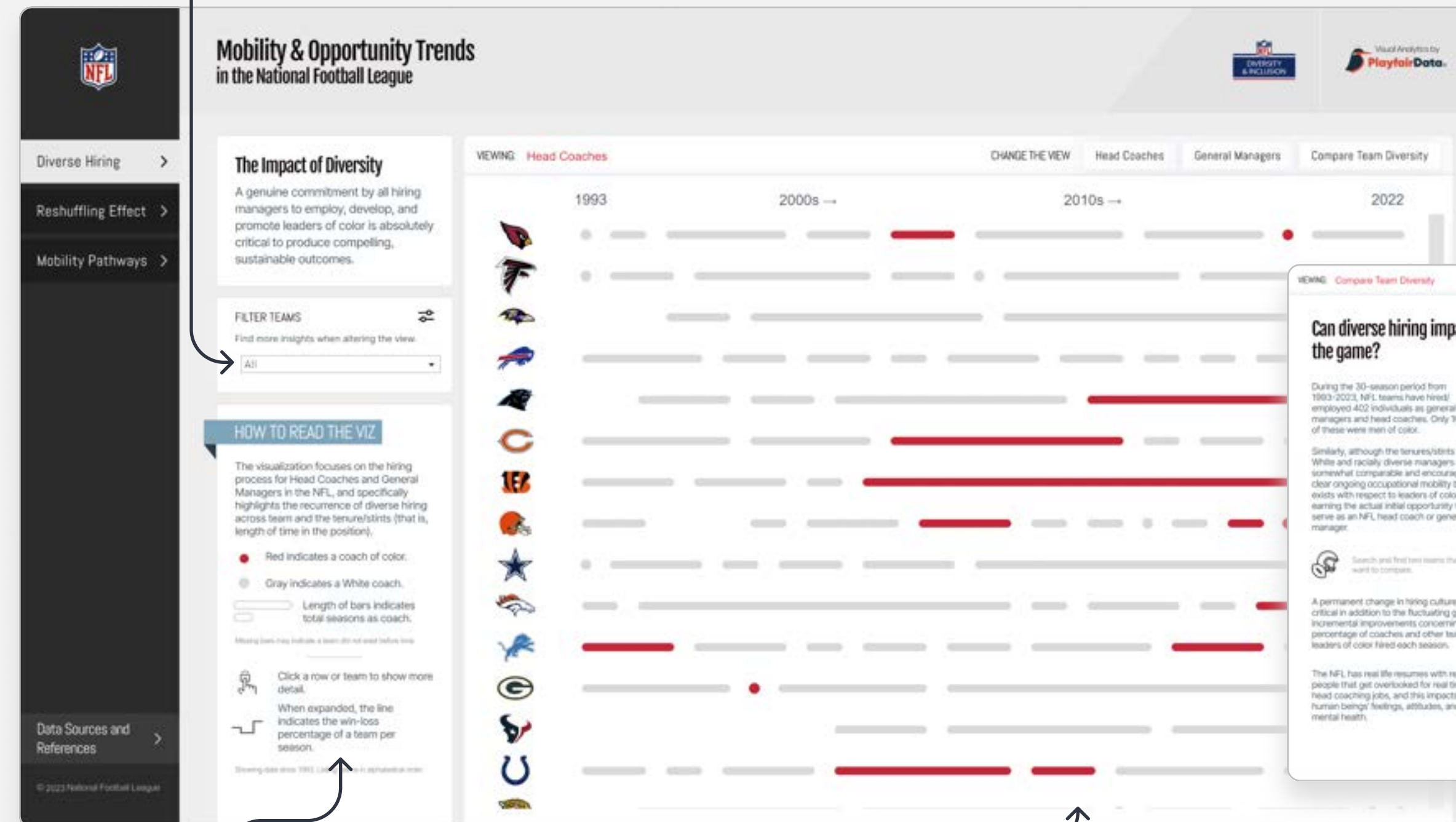
Diverse Hiring

A walkthrough of our final product solution.

A genuine commitment by all hiring managers to employ, develop, and promote leaders of color is absolutely critical to product compelling, sustainable outcomes.

Use the **Diverse Hiring** tab to explore teams' history of diverse hiring of both head coaches and GMs. Compare two teams' diversity hiring and performance head-to-head.

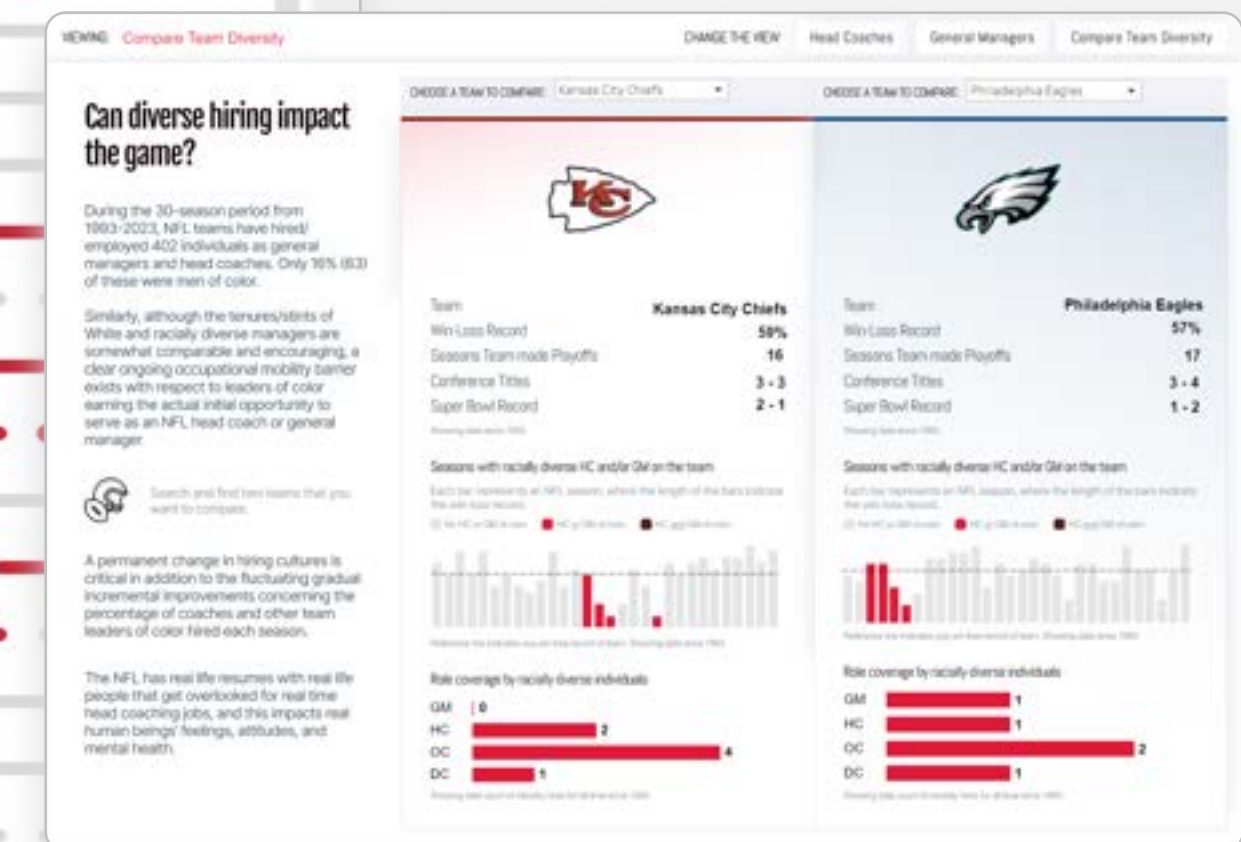
Filter the teams to find insights.



Key legend to understand the data and dashboard architecture.

Compare each team's history of diverse hiring and tenure length of head coaches and general managers.

Change the view to explore head coaches, general managers, or compare teams head-to-head.



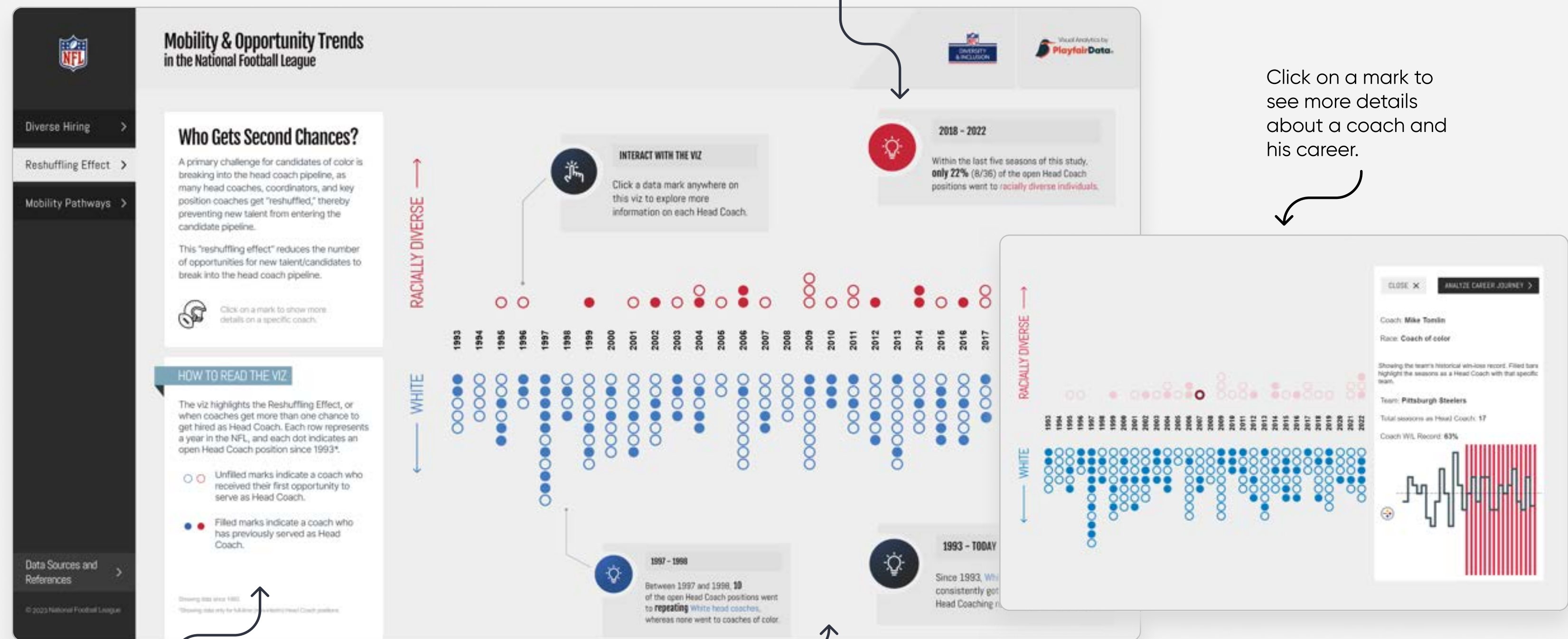
MOBILITY & OPPORTUNITY TRENDS Reshuffling Effect

A walkthrough of our final product solution.

A primary challenge for candidates of color is breaking into the head coach pipeline, as many head coaches, coordinators, and key position coaches get “reshuffled,” thereby preventing new talent from entering the candidate pipeline.

This “reshuffling effect” reduces the number of opportunities for new talent/candidates to break into the head coach pipeline.

Use the **Reshuffling Effect** tab to search and find Head Coaches whose career trajectory can be compared and studied.



View custom annotations for more insights on the view.

Click on a mark to see more details about a coach and his career.

Key legend to understand the data and dashboard architecture.

Contrast the number of white head coaching candidates that have been hired and rehired compared to candidates of color.



MOBILITY & OPPORTUNITY TRENDS

Mobility Pathway Analysis

A walkthrough of our final product solution.

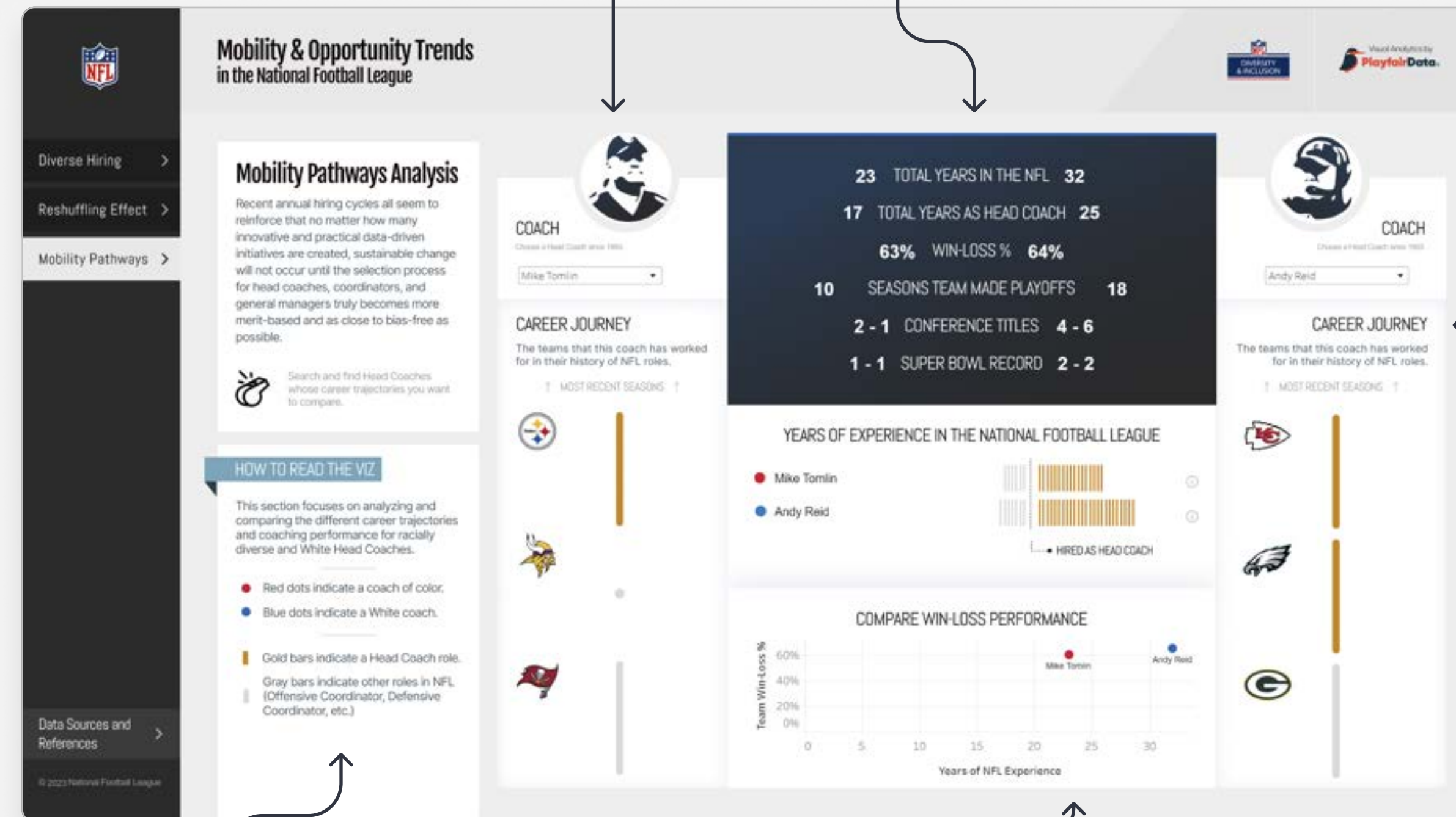
Recent annual hiring cycles all seem to reinforce that no matter how many innovative and practical data-driven initiatives are created, sustainable change will not occur until the selection process for head coaches, coordinators, and general managers truly becomes more merit-based and as close to bias-free as possible.

Use the **Mobility Pathway Analysis** tab to search and find Head Coaches whose career trajectory can be compared and studied.

Choose from the Head Coach historical roster to see their stats and draw comparisons on career trajectories.

See the general statistics of their time in the NFL.

See the length of their employment per teams and the roles that they filled.



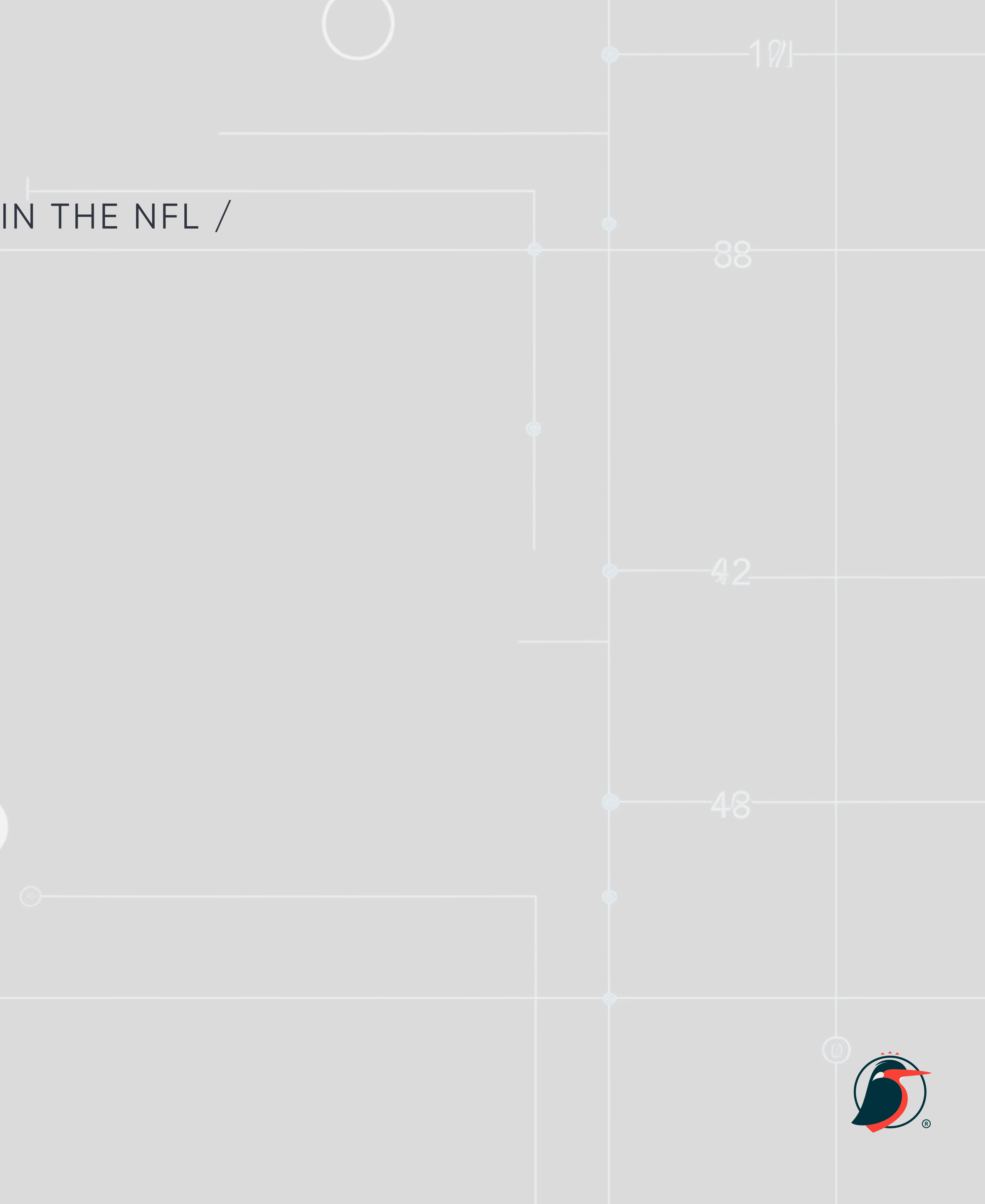
Key legend to understand the data and dashboard architecture.

Contrast the performance and years of field experience in pro football.



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Conclusion



In the end, this report came together through the hard work and collaboration of the Playfair team. We sought the conception and creation a tool that was able to spur action to create a more inclusive hiring process for people of color; visualize the data in a way that's consumable, immersive, and intuitive; and highlight the human element, because real people are and will be impacted by the NFL's diversity, equity, and inclusion initiatives.

Playfair Data loves taking on the world's biggest challenges including lowering greenhouse gas emissions, improving medical research, and educating the public on issues like occupational mobility in the NFL.

Want to team up to overcome a challenge together?

[Start a conversation](#) →



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