The Numbers behind eSports

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Initial Project Proposal

Our team began this project with the focus of exploring the history and growth of eSports. While the electronic gaming trend is seemingly rising in popularity, we wanted to take a look at the numbers behind it. Below is the initial proposal we submitted for our project.

With this project, we want to educate an audience unfamiliar with eSports on what it is and how it has grown through the years. We also want to provide an argument to people who don't see eSports as real sports by showing through data visualization just how big the industry is.

We will break down our project into three sections:

- *Compare eSport viewership and traditional sport viewership*
- *Compare and contrast eSport communities to one another over time*
- *An in-depth case study of popular eSport game, Dota 2*

Considering time is a heavy constraint in this project, will consider our project a success if we at least accomplish the first two bullet points.

Data

The data that we're going to use to fuel our visualizations will come from a variety of sources. When comparing the growth of eSports against more traditional sports, we will use viewership data collected from Twitch.tv (https://newzoo.com/insights/rankings/top-games-twitch/). Twitch.tv is the major platform in which eSport events, matches, and games are streamed on, allowing us to compare these numbers to that of television viewership for other sports (https://www.statista.com/statistics/251536/average-tv-viewership-of-selected-major-league-baseball-games/).

When we take a deeper dive into exploring the different communities within eSports, we will use the data sources from eSports Earnings (http://www.esportsearnings.com/history/2016/games). This data set has nearly two decades worth of historical data tracking the number of professional players in each eSport game, the amount of monetary prizes for each eSport, and even a breakdown of individual's earnings and earnings by country. This data will allow us to compare and contrast a variety of games with many variables, as well as allow us to track the popularity of certain communities over time.

We also may take a closer look at a single eSport community granted we have enough time. To do so, we will conduct a case study of a popular MOBA eSport: Dota 2. We will use the data provided from the game's community Wikipedia page (http://wiki.teamliquid.net/dota2/Main_Page) which will give us access to in-depth numbers for tournaments, team earnings, and individual player earnings.

Data Processing

A majority of the data that we will be working with is currently provided in segmented tabular forms. This will require us to do a fair amount of data cleansing before we are able to quickly visualize the data. Due to the fact that most of the data we will be working with will be strictly quantitative (number of people watching, prize pool amounts, etc), the actual cleaning of our data shouldn't be too difficult, since they're all in a similar format.

We are not working with any APIs to extract our data, so the method in which we will collect and process our data will be to copy the data from our sources into a CSV file. This will allow us to manipulate the data either through Excel (or Python if required) to create a common format.

Visualization Design

We plan to display our data in a narrative, scrolling webpage. This will allow us to convey a story describing what eSports is, and provide context for a deeper dive into the statistics behind it.

Some initial visualizations we've sketched out are as follows:
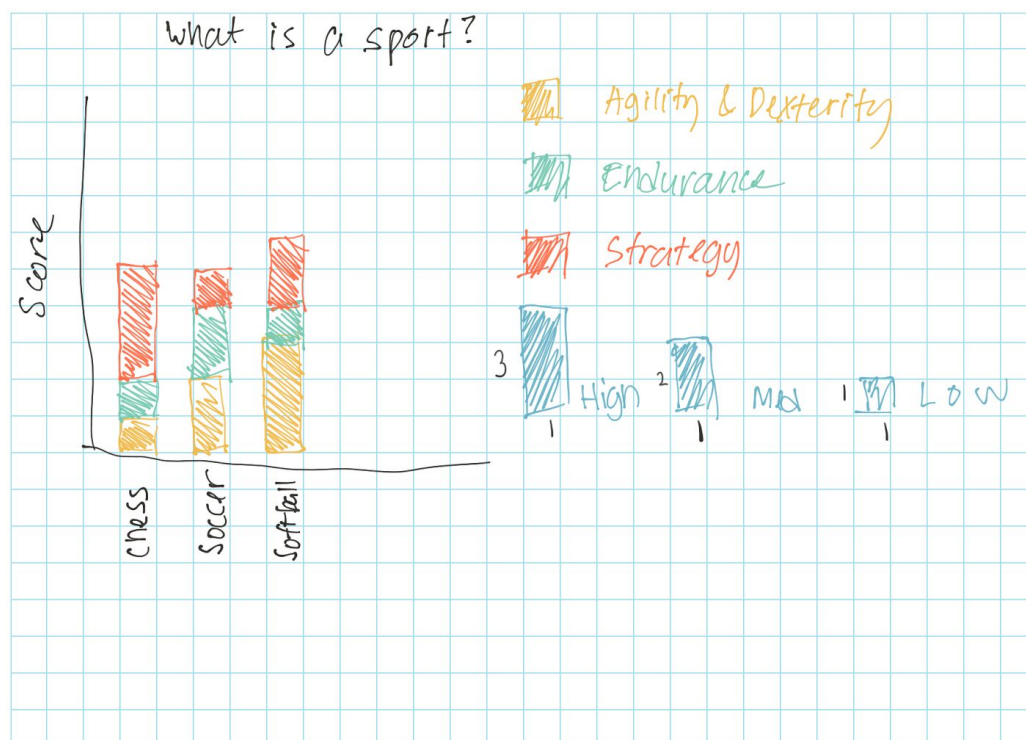
To present an argument that existing sports are not purely a demonstration of physical prowess, we want to use a visualization to show proportionality between the non-physical aspect of a sport such as strategy making and the physical ones such as agility and dexterity.
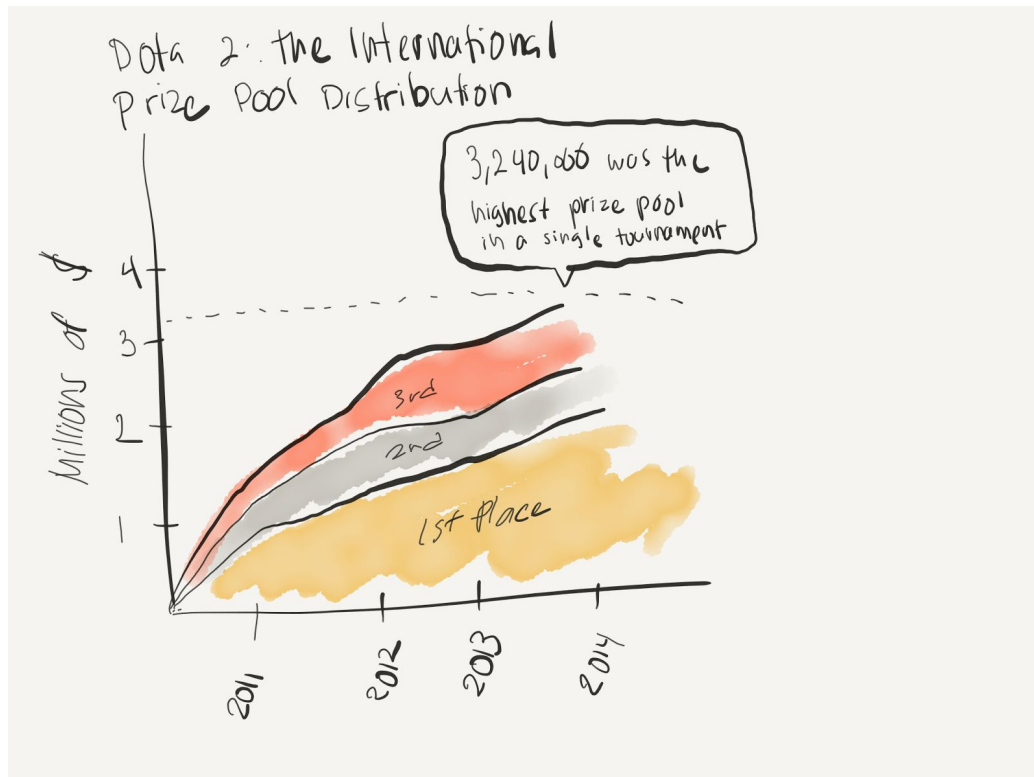
Using a stacked line graph, we can show not only how big the overall prizepool is for a specific tournament, but also how much each participant can potentially earn if they compete in the tournament.
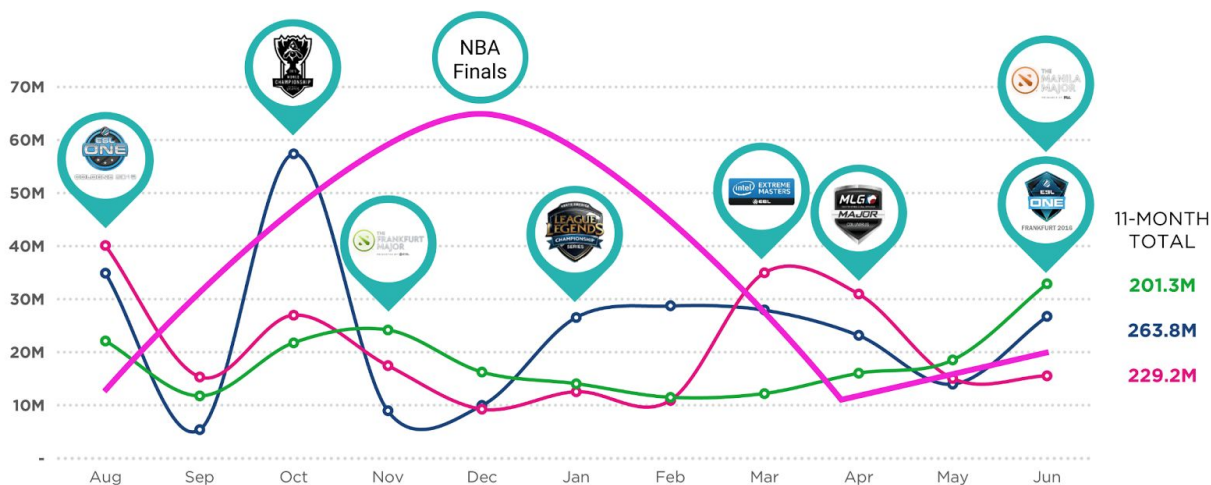
A line graph over time will allow us to compare how the viewership of major eSport tournaments compare against the major events of traditional sports, such as the NBA finals or the World Cup.

Final design example:
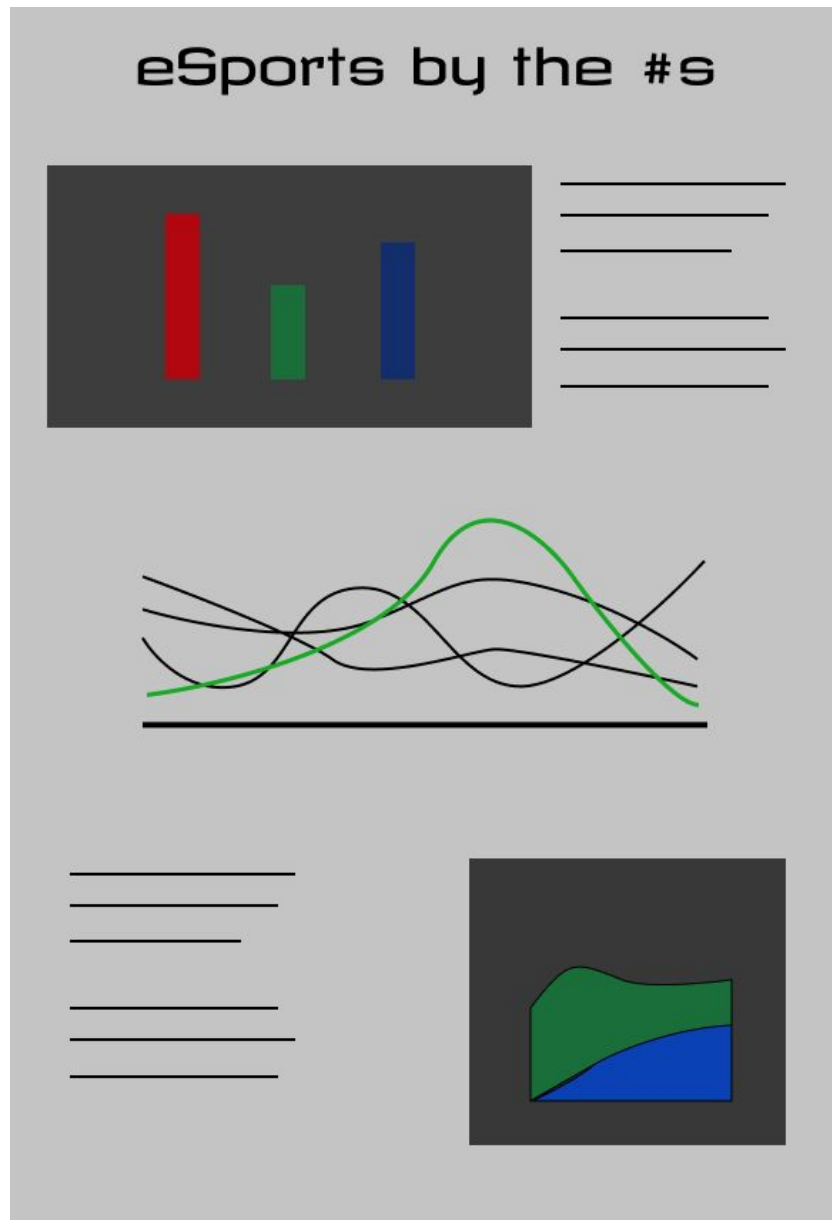
This example of a final design combines all the visualizations we have ideas for, and places them in a vertical scrolling page. It would be ideal to make this page fluid with animations so that the experience of exploring the data is intriguing. Using a common color scheme throughout the entire web page is important for our project so that users have a lighter cognitive load when swapping contexts for a new visualization.

Must-Have Features

As mentioned above, we will use a scrollytelling format to progressively tell a story about esports. Graphs and visualizations that animate according to the scroll offset will also be present in multiple points of the webpage. This will be our main form of interactivity.

A demo of the library we will be using to implement this can be found here: http://1wheel.github.io/graph-scroll/

Optional Features

Other forms of interactivity we can add in include combining multiple graphs that relate a single factor with multiple other factors into one graph and enabling the user to switch between these categories. For example, we can combine a scatter plot that relates total earnings with years playing and another graph that relates total earnings with age. As our visualizations become more concrete, we will be able to explore a wider range of optional features in addition to the ones listed here.

Ideas and Iterations

Evolution of Visualizations

Once we collected our data from the sources listed in our project proposal, we began to explore the simple visualizations to give us an idea of how they might tell a compelling story.

We ideated what types of visualizations or interactions could add to this story:

You-Draw-It

Inspired by an interactive visualization from the New York Times, we explored the idea of allowing users to draw out their own assumptions of the skill required to be a professional eSports player. These types of interactions allow for the user to see their own bias and opinions before they are influenced by the data. We also had the idea of using the user-inputs from this section to aggregate people's opinions on eSports, which could be further represented in a future iteration of our project.
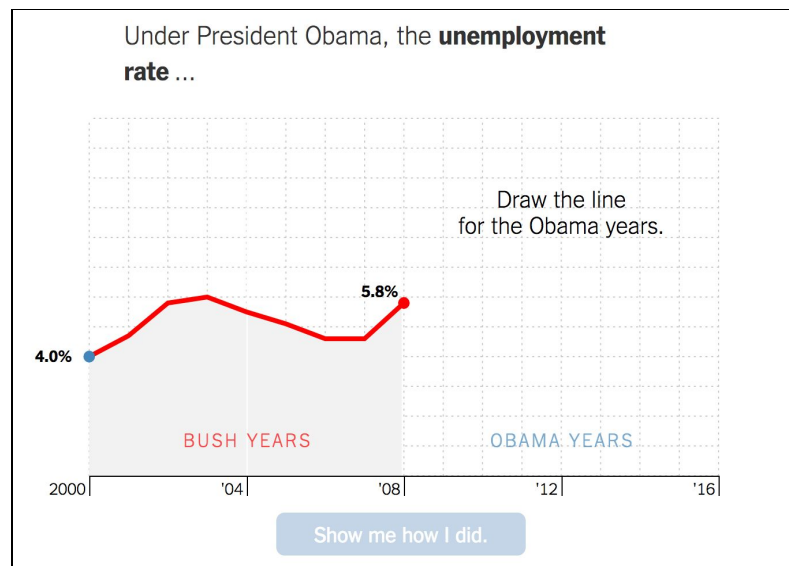

Radar Chart/Kiviat Diagram

When trying to compare eSports against more mainstream sports, such as football and baseball, we found that there wasn't a unifying criteria being used to evaluate them. We found a data set provided from a group of sport experts at ESPN that ranked many categories related to the difficulty of sports. These rankings allowed for each mainstream sport to be compared to one another, but eSports was not on
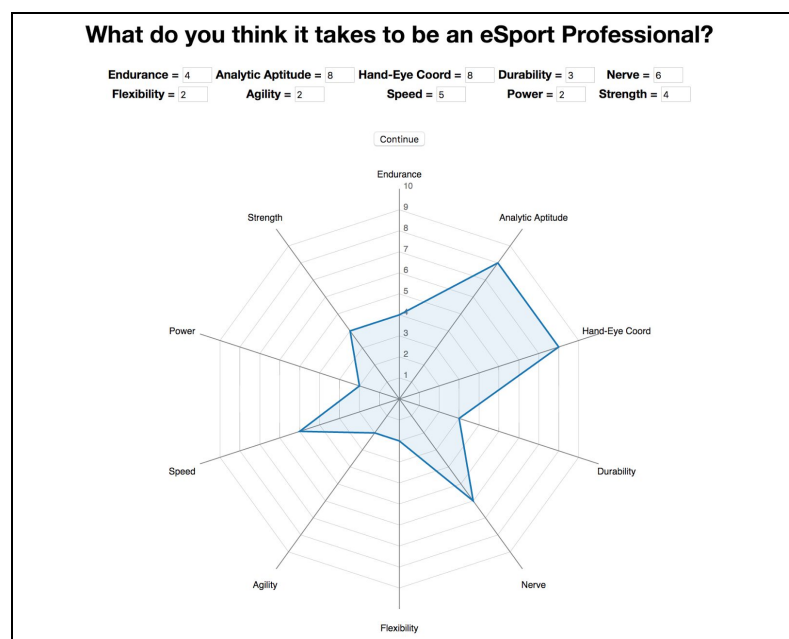
this list. Some of the categories overlapped with what it took to be in eSports, such as dexterity, hand-eye coordination, and analytic aptitude. This overlap motivated us to compare eSports and traditional sports with this criteria, while asking the user to provide the rankings of the eSport categories. This accomplishes our goal of gathering user bias/opinions, as well as providing a context that is familiar to a normal person.

World Map

Our data showed that tournaments are held all over the world in a variety of countries. To show off this fact in a compelling way, we decided to use d3 projections. This method allowed us to present the relative location of each event, as well as the interaction for users to hover and discover more about each event.
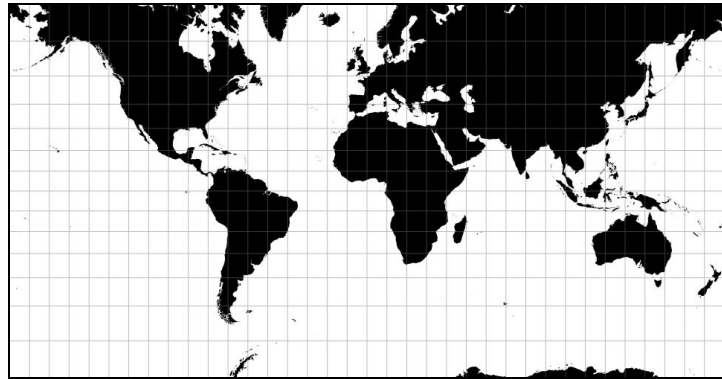
Evolution of the Story

Our audience began as those interested in pursuing eSports as a profession. We wanted to show how playing for different organizations within different games led to varying earnings. As we moved forward and collected more data, we thought that the monetary aspect of eSports would fit better as a case study, given the context of the growth of eSports.

To broaden our website's audience, we decided to focus on individuals who are currently unaware of what eSports are, and those unaware of the popularity of eSports. With this audience in mind, our team's goal became to use visualizations to facilitate a coherent narrative surrounding eSports and its growth.

Our website evolved to include a handful of slides each geared towards guiding a visitor through the concept of eSports. These pages include:

- eSports introduction
  - The goal of this page is to get our audience a brief explanation of eSports so that they have context for the data that is to follow.
- Twitch.tv viewership
  - The goal of this page is to help illuminate the popularity of eSports.
- Tournament viewership
  - The goal of this page is to show that the popularity of eSports is not bound to a single region, but instead is present all over the globe.
- eSports skill rating

- ○ The goal of this page is for users to test their own biases and opinions about eSports compared to more traditional sports.
- ● Game earnings
  - ○ The goal of this page is to show the monetary value that eSports has, as well as to provide legitimacy to the concept of pursuing eSports as a career.
- ● Individual player earnings
  - ○ The goal of this page is to provide an in-depth example of a single professional eSports player, showing off the potential earnings from many different tournaments.

Final Product

Our final design consists of multiple visualizations tied together within a story-scroll website. To view the webpage live, visit: https://adamgyee12.github.io/eSportsVis/

What are eSports?

eSports, also known as electronic sports, are a form of competition through video gaming.

Similar to traditional sports, eSports are a platform for teams and individuals to craft their skills and compete against one another.
Unlike traditional sports, the term eSports is an umbrella for a long list of games, including on it **League of Legends**, **Counter Strike**, **Super Smash Bros.**, and many others.

eSports have been gaining popularity over the past few years with the rise of streaming services such as Twitch.tv that allow viewers to tune into individual gamers, regular season matches, and even tournaments.

In **the past 18 months**, over **4 Billion** hours of **eSports** were watched on Twitch.tv
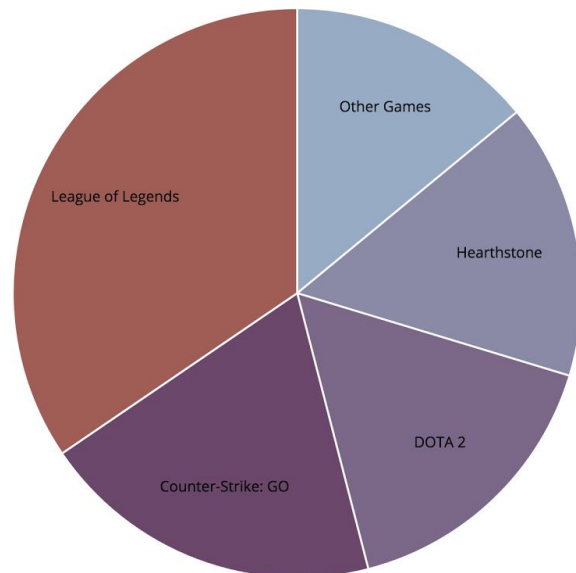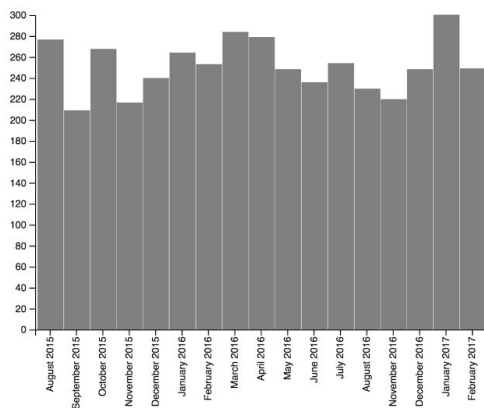
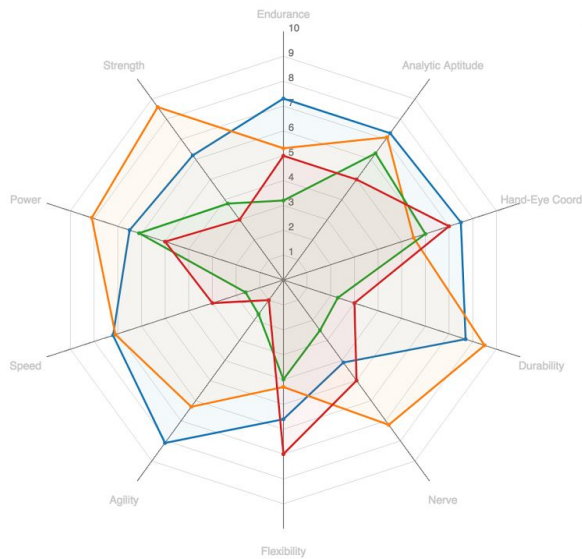eSports tournaments capture a global audience and are hosted in many counties all over the world.
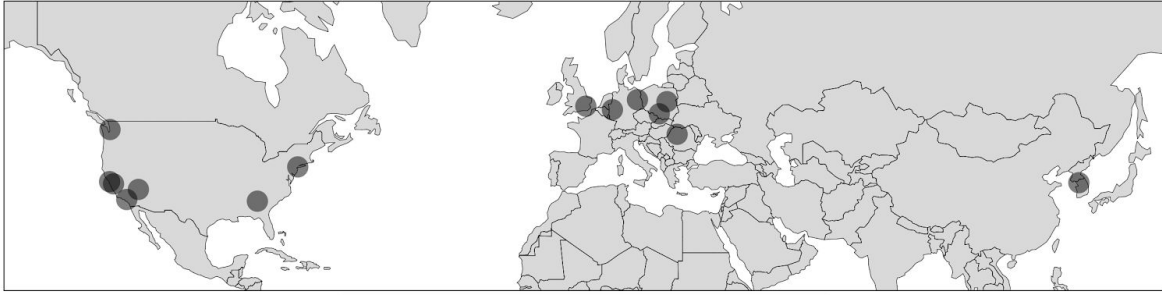
Intel Extreme Masters Katowice 2017 was watched by **46 Million** unique total viewers.

What do you think it takes to be an eSport professional?

Assign a value to measure the demands of each skill required of eSports, compared to other sports.

- + Endurance
- + Analytic Aptitude
- + Hand-Eye Coord
- + Durability
- + Nerve
- + Flexibility
- + Agility
- + Speed
- + Power
- + Strength

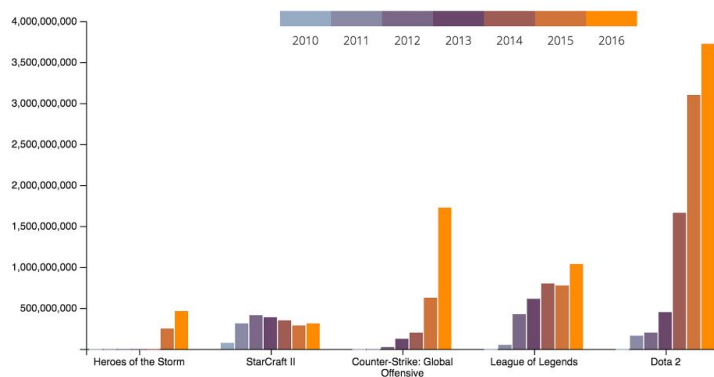When fininshed, see how your rating of eSports compares against traditional sports' ratings

Toggle Football | Toggle Basketball | Toggle Golf

It's about the fame and (a whole lot of) fortune

Prize pools for eSports tournaments have been **growing** during the **last 6 years** as the viewership for these tournaments **attract more sponsors**. But by **how much?**

In 2016, **Dota 2** accumulated

$3,730,875,107
total prize money from

129
tournaments
where a total
of

783
professional
players
competed

Start them young

Sumail Hassan, a Pakistani eSports player featured on Time Magazine's Most Influential Teens of 2016, earned his **first million at the age of 16** during his **first year** as a professional Dota 2 player in **2015**. Let's look at what his career has looked like since then.
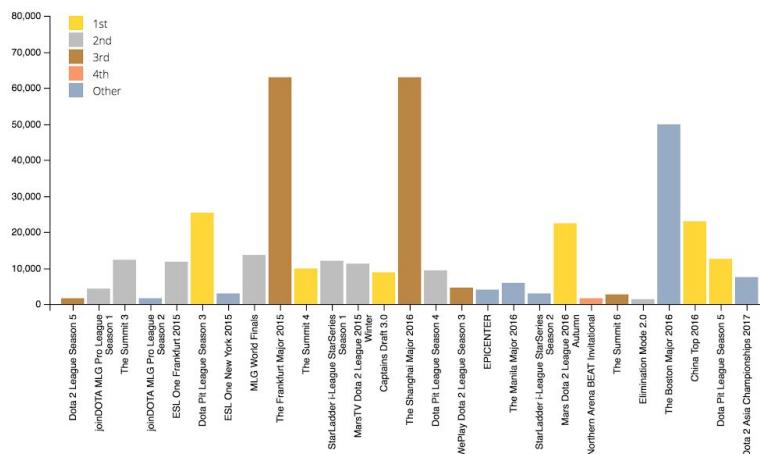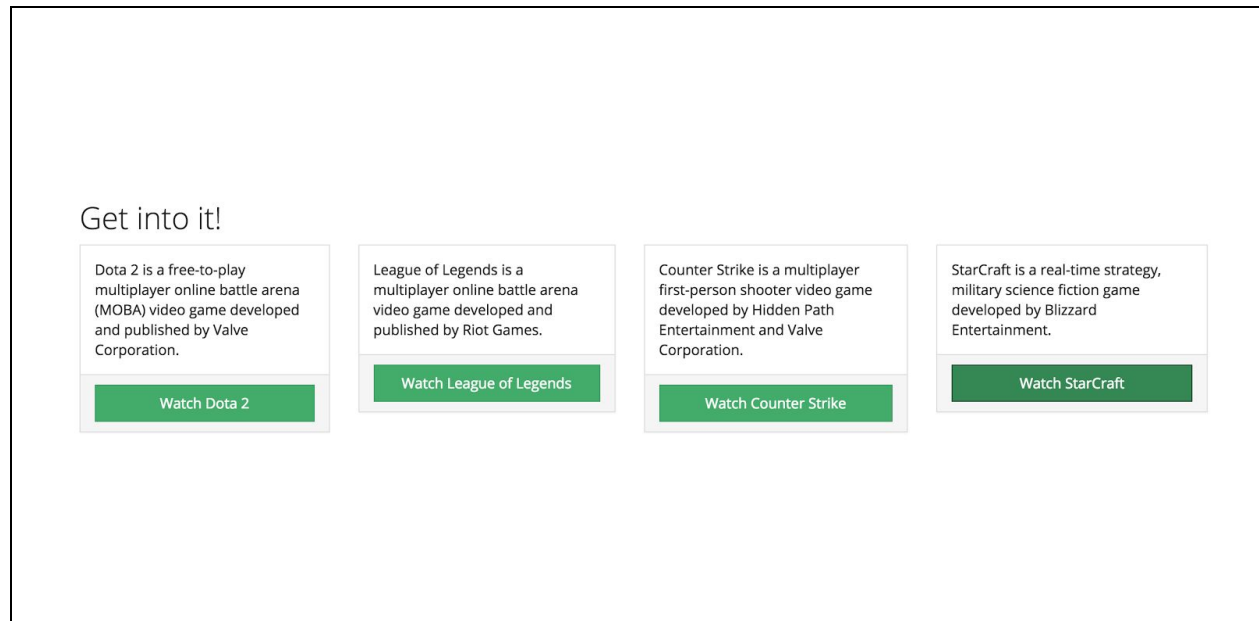

Top 3 tournaments:

$1,326,932.2
1st place – The
International 2015

$436,179.6
3rd place – The
International 2016

$256,831.6
1st place – Dota 2
Asia Championships
2015

Overview and Motivation

The motivation behind this project came out of the desire to explore the growth and popularity of eSports. Our team members enjoy playing and following many competitive video games, and we wanted to discover the actual numbers behind the sport. The overall goal of this project is to educate those who are unaware of the growth and popularity of eSports.

Inspiration and Related Work

The content of this project was inspired by the hundreds of articles online comparing the viewership of major eSport tournaments to the NBA finals. These articles claim the monumental growth of eSports, but often lack the data to back the claim up.

The appearance of our final layout was inspired by [Through the Eyes of the Survivor](), a visualization website portraying the data behind sexual assault. The way this project used a compelling narrative surrounded with visualizations inspired us to take a similar approach.

Questions

We initially wanted to answer the question: how plausible is it to pursue a career in eSports? What are the rewards, and who are my potential employers?

As we collected data on this subject, we realized we wanted to broaded our audience to include those who were unfamiliar with eSports, and so we needed to provide some context of what

eSports was. As our project evolved, we began focusing on different questions, such as: What are eSports? How popular are eSports? How much money to eSport professionals make?

Data

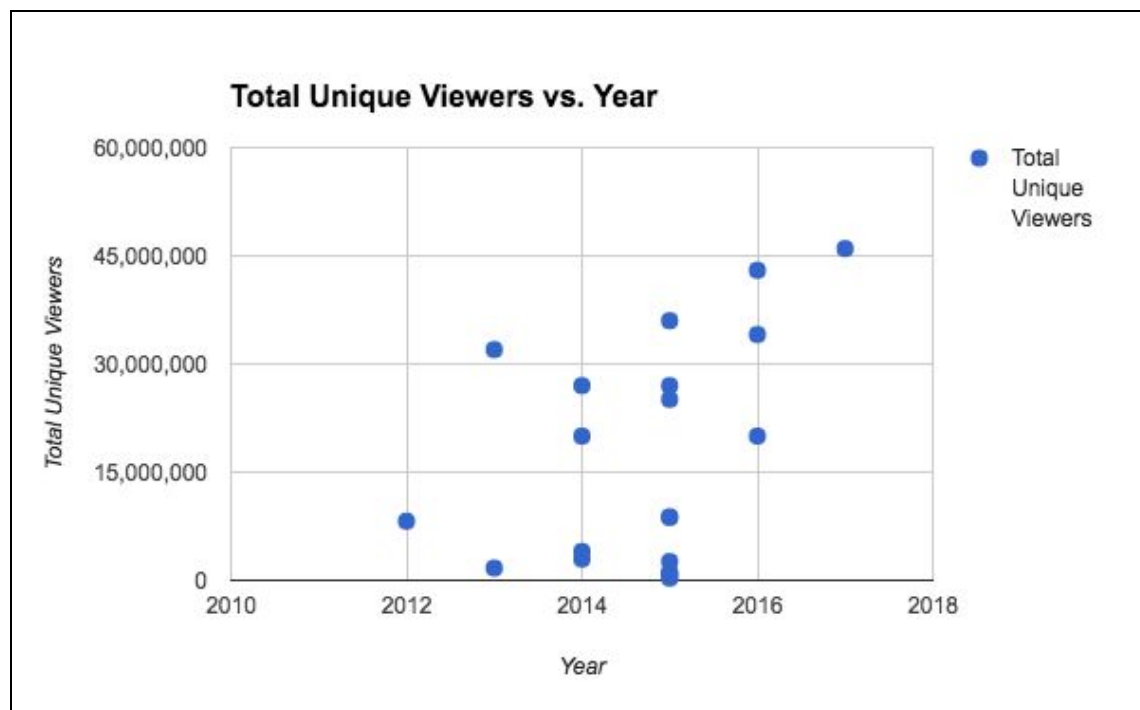The data we ended up using for this project came from the following sources:

http://www.espn.com/espn/page2/sportSkills?sort=flexibility#grid
https://newzoo.com/insights/rankings/top-games-twitch/
http://www.esportsearnings.com/history/2016/games
http://esports-marketing-blog.com/43-million-unique-viewers-reached-throughout-league-legends-world-championship-2016/
http://esports-marketing-blog.com/gamoloco-dataviz-monday-review-10/
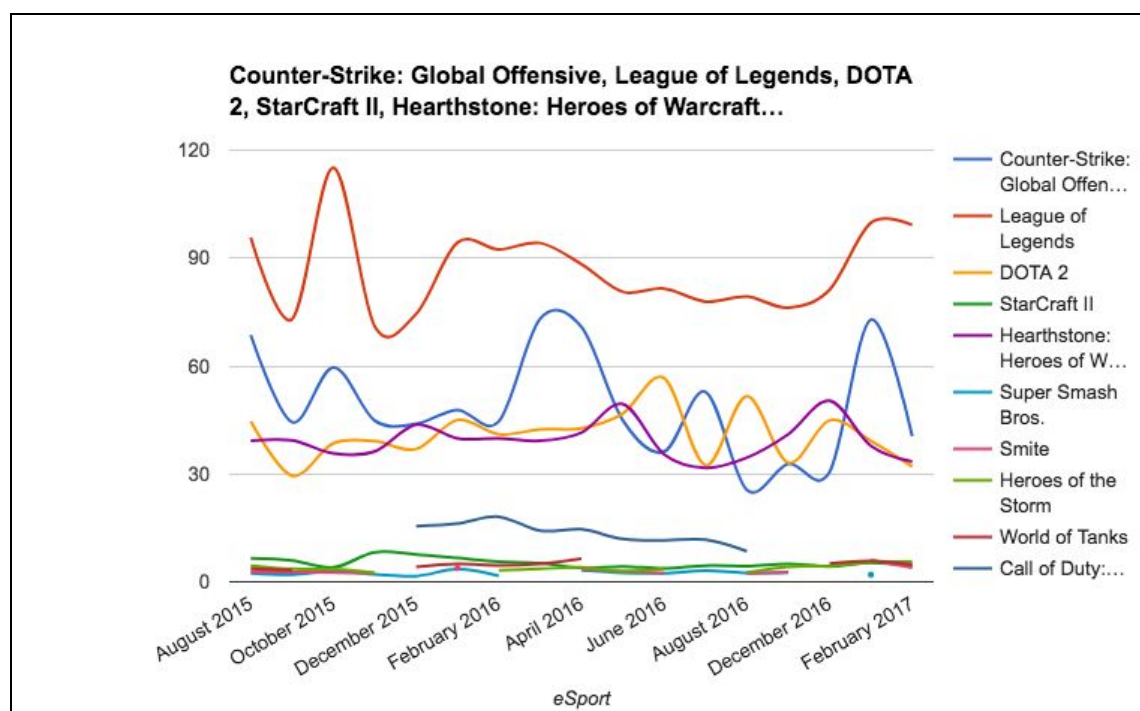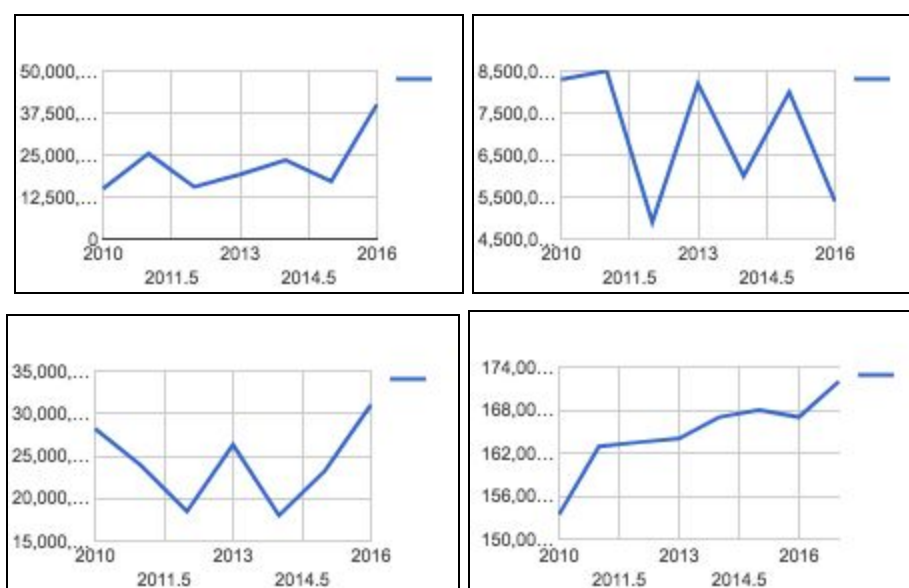http://esports-marketing-blog.com/esports-viewership-numbers/

Exploratory Data Analysis

We initially used rudimentary methods of exploring our data, utilizing the built in graphs of Google Sheets. Doing this allowed us to get a feel of what the data actually was, and inspired us to explore more unique visualizations and interactions to allow users to explore the data themselves. These graphs additionally proved to us that eSports was indeed growing and that over the years it has attracted more viewership, tournaments, and earnings.

Counter-Strike: Global Offensive, League of Legends, DOTA 2, StarCraft II, Hearthstone: Heroes of Warcraft…

Traditional sport viewership over the years

Design Evolution

As mentioned above, we considered a variety of visualizations throughout our design process. See the [Evolutions of Visualizations](#) for more details.

We deviated slightly from our proposal as we did less comparison of eSports to traditional sports in our final product. In place of that, we spent more time building up the context of what eSports is as we decided to focus on an audience that has little knowledge of the area.

Implementation

The intent of each visualization is to allow users to explore the data themselves. Each visualization has an interaction associated with it that provide additional data to the user.

Hovering over the pie chart segments the bar chart to show specific data about the game that is being hovered.
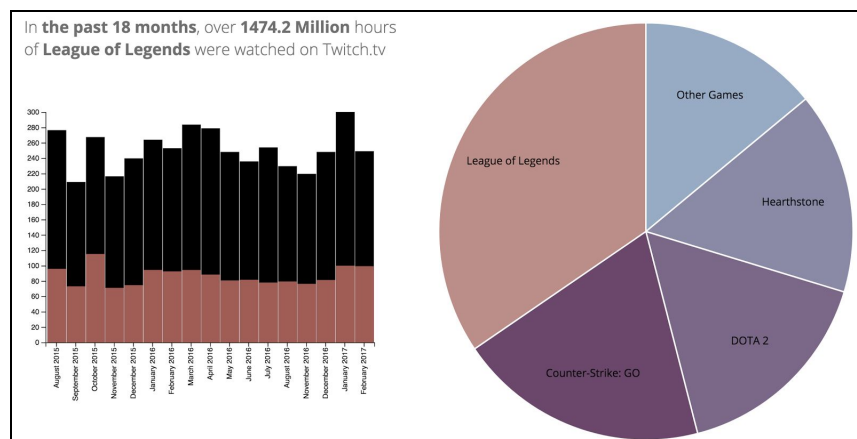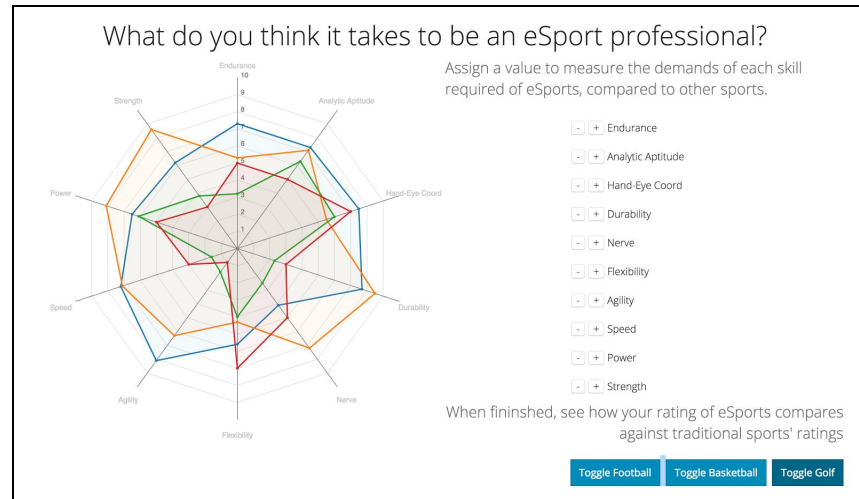

Hovering over the dots on the map alter the data inside of the grey box, updating it with tournament viewership information and a picture for context.
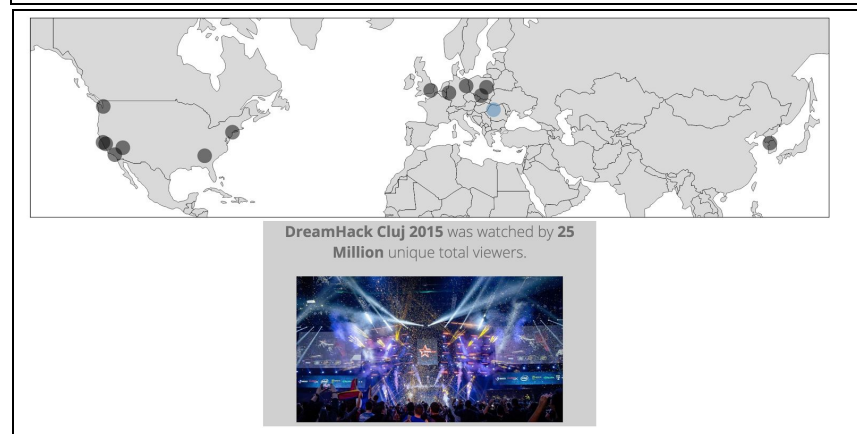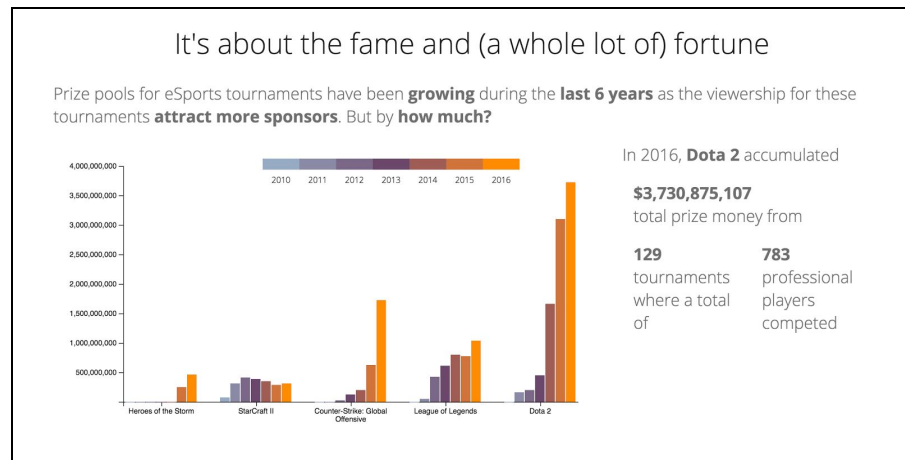
Changing the values of each sport demand indicators alters the shape of the radar graph.

Hovering over each bar changes the panel to the right of the graph, updating it with total prize money, tournaments played, and number of professional players for that game in that year.

Hovering over each bar creates a tooltip over each bar that presents the total amount that Sumail earned at that specific tournament.
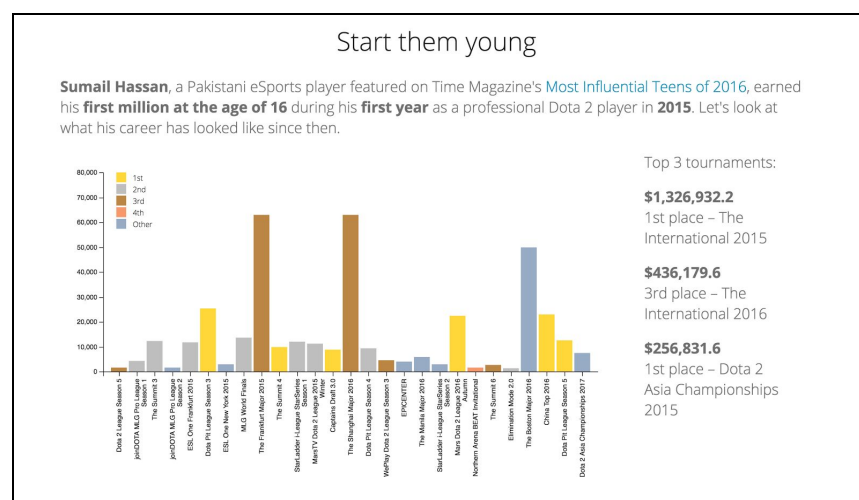
Evaluation

We learned from our data that eSports is indeed a growing field. As we see the viewership numbers increasing, the number of tournaments increasing, and the increasing amount of earnings of professionals, our team obtained a clearer picture of the eSports landscape. We believe that having simplified graphs with the ability to interact and explore allow for our final product to educate those unaware of eSports. As we move forward, further iterations would ideally include additional comparisons to traditional sports for further context for our audience.