The Art of Cinema*

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Abstract. This paper highlights and speaks about the development of a Web Application using Vue.js. The application is known as ' The Art of Cinema' highlighting information and infographics about the world of movies. This paper talks about the aim, motivation, target audience,data, methodology, approach, features and finally the future scope of the dashboard. Majority of the visualizations in the dashboard have been created using D3.js.

Keywords: Data Visualization· D3 Js· Vue.

1 Introduction

In today's day and age, the one thing that brings people together is movies. Motion pictures provide us with the opportunity to escape our real-world problems regardless of our age, race, religion, or location. We were inspired by the ability of movies to connect and bring joy to people and have implemented a dashboard that let's you explore more about the films you love to watch. Our dashboard is expansive and interactive but at the same time it is user adaptable. The dashboard let's you explore movies and the user has the capability to filter them by rating and revenue across different genres. The dashboard is not limited to information about English movies, the user can learn more about movies released in foreign languages and their place of origin. Hence our interface is a one-stop hub for all cinephiles, where they can learn and explore more information about their favourite movies, the movie industry and how it has transitioned over time.

2 Related Work

The movie dashboards and visualizations available online generally focus on specific use-case. For example the visualization represented below focuses solely on how movies released by Disney have been performing and their box office sales.[3]

We were inspired by the Power BI Interactive Dashboard represented below to incorporate user interactivity in our proposed interface. The dashboard effectively communicates different data and the user has the ability to filter among features.[2]

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Fig. 1. 1.Disney Box Office Bar Chart, 2.CMBI Interactive Bar Chart

We have sought to create a dashboard that is user adaptable but at the same time provides them with the functionality to filter and sort through the data. We found that most visualization found online focused on comparing and analysing the movies in terms of profitability metrics. We wanted to make sure our dashboard provided users with the functionality to explore and learn different information. The user has the capability to navigate between genres and it is made to be interactive. We also included graphics that aren't available online for example, we used Mapbox to highlight the popular movies and tv shows shot around Los Angeles. [1] [4]

3 Data

3.1 Data

We have used three Kaggle data sets for the purpose of our projects.

1. An IMDB Movie Data set: Title,Year of Release,Genre,Duration,Country of Release,Director and Average Votes as some of the key attributes.
2. Top 1000 IMDB Data set : Name,Year, Certificate,Run time, Genre, IMDB Rating, Overview, Star and Gross Revenue
3. Oscar Winners Dataset: Name, Year, Movie, Award

3.2 Descriptive Statistics

The following are some descriptive statistics of the datasets:

- Mean Duration of movies: 100.35 mins
- Maximum Duration of movies: 800 mins
- Average Vote given to movies: 6/10
- Most common Genre: Drama followed by Action and Comedy
- Highest IMDB rating: 9.3

- Lowest IMDB rating: 7.6
- Mean IMDB Rating; 7.94
- Mean Gross Revenue: 68M $
- Most recent Release Year: 2020
- Oldest Movie release Year: 1920

3.3 Pre-processing

Both the data sets mentioned in 3 were cleaned with respect to column names, data types and uniformity of values. Missing values were removed. Data points were grouped according to genre to generate genre specific visualizations. Information concerning genres, actor names etc, was not in required format and was present in one column rather than as individual values. These were separated into different columns for easier usage.The Gross income attribute was originally a string value and it was converted to a numeric value.

4 Approach

Our first aim was to find the right kind of data. Extensive research lead us to finding information about movie reviews and other important features such as Revenue, Ratings, Certificate etc. We observed that all the statistical information is scattered in different locations and not many are visually represented. Hence we decided that it would be an enriching experience if we could try to simplify the extensive data into simple and visually appealing graphs and info-graphics. Our base framework was Vue.js where we created a prototype for our dashboard. Our aim was to keep it simple but at the same time aesthetically pleasing and easy to use.

Our dashboard consists of Interactive Bar Charts, Pie charts, Maps, Trees, all created using D3. To make it easy to use, we tried to not clutter it with too much information and facilitated navigation through the dashboard using buttons. A light colour palette was used as our background.

The website has been constructed by keeping visualization wheel in mind. We have tried to find the intrinsic balance between keeping the info graphics shallow while containing enough information. The wheel that we tried to follow can be found below.

5 System

5.1 Methodology

Data Collection and Processing was our first step after which we decided the important attributes that we were going to visualize. Pre Processing of data was done with Python. Vue.js was decided as our base framework and a prototype of the User Interface was then created. We decided the kinds of charts we were going to implement, and started creating them one by one, and also tested how

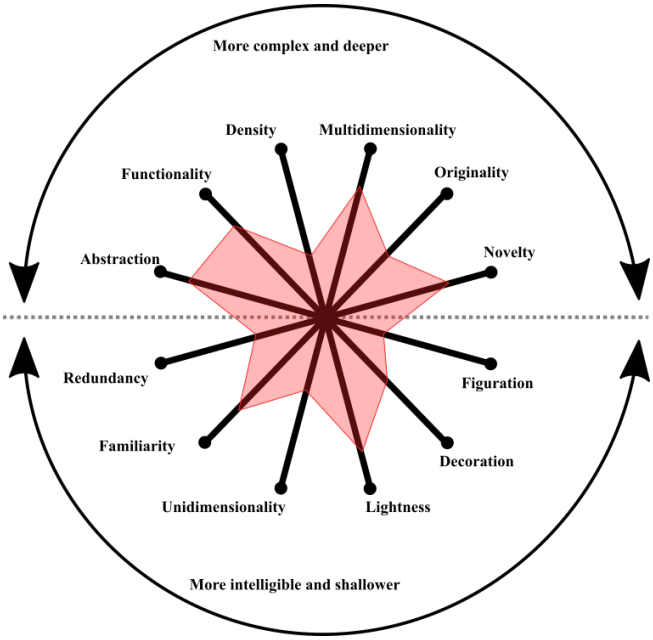

Fig. 2. Visualization Wheel

it looked once it was mounted in Vue. We implemented various kinds of charts: Animated, Interactive, Responsive, Layout and Maps; all with the help of D3.js. Map Box API was used to create an interactive map. Styling was done with CSS and the front end with HTML. We divided our dashboard into sections with the help of buttons which helped in easier navigation and at the same time easier segregation of our data.

5.2 Highlights and Main Features

1. Home Page consisting of several buttons for navigation
2. A timeline created using D3 to show the progress of cinema and the various eras in the span of 50-80 years.
3. A Tree Map to emphasize on the Oscar Award winners and the categories of the awards with their respective winners.
4. A MapBox Map showing the famous Film locations present in and around Hollywood, Los Angeles, California.
5. Interactive and Responsive Bar Charts highlighting the Revenue and Ratings of the Top 20 movies of Genres Comedy, Action and Adventure. These have additional functionalities such that they can be sorted alphabetically by name and in ascending/descending order by Revenue. The data can also be sliced to just view the Top 5 of each category.
6. A proportional symbol Map using D3 to show the top 20 countries by proportion of movie releases.

7. Pie Charts to focus on the proportion of movies of particular Film Ratings/Certificates. These are also filtered by Genre.

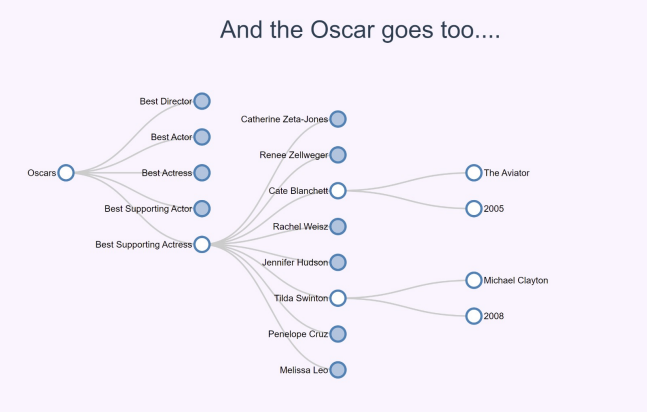

Fig. 3. Oscar Winners - Tree Chart

6 Conclusion

6.1 Contributions

- Rushi: Vue.js framework implmentation and integration of all charts. Created the d3 layout map.
- Divya: Preprocessing and cleaning of Data. Found appropriate geojson mapbox data. D3 symbol map, interactive bar charts and timeline map were created and implemented.
- Aparna: Handled colour scheme and UI of the app . Made the animated bar chart.

All the other charts were equally divided amongst all of us and we created them individually. We later merged and integrated them into our Vue App. Documentation was also divided amongst the three.

6.2 Future Scope and Improvements

In order to scale the application in the future, more data and more attributes could be used. Utilization of a backend would help retrieving and processing the data faster, an aspect which we would try implementing in the future. Another feature worth implementing in the future would be network graphs(to know connections between actors etc) and advance D3 visualizations which will help the user get a more effective experience. These will enable the user to play with and filter the data more.The data should be tried to be made more dynamic than static.

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