Visualization on Hong Kong Youth Data

Project Plan

Background

Everyone has gone through the path of being a youth when he or she was young. Youth is the future caterpillar of a society and a change in habits or behaviours can affect the society in the next generation. We may have heard many statements related youth, for example, being a university student is not that precious compared to life in several decades ago, as the percentage of youth that have studied in universities is much higher for current times. To know whether a saying is true or not, finding related statistics may be a nice way for it. In fact, the percentage of youth in Hong Kong who had undergraduate level as highest education level has increased significantly from about 11% in 1996 to around 31% in 2016 [1][2]. Some possible factors behind this enormous change could be government policy, change in family structure or the improving economy. There are much more issues about youth in Hong Kong that are worth to investigate. This project aims to use data visualizations to show people how youth-related issues, such as the aforementioned, have occurred, to remove their doubts on these issues. The data source for the visualizations relies on online resources, such as statistics from the Census and the open data provided by the government.
Objective

First, this web-based project intents to let users develop a better understanding on youth in Hong Kong. Nowadays when people want to find information or statistics about something, it is not a must for them to go to bookstores or libraries for every single time, compared with people in the previous generation. Instead, there are a myriad of information available in the internet. However, many useful data are just presented in the form of tables and they usually contain hundreds, thousands, or even millions of tuples. So, when people look at these tables, it is almost impossible for them to figure out some trends about the data, such as the maximum value of an attribute. Therefore, some people may be scared of these long and boring tables and decide not to continue studying on them. This hinders the spread of information.

Many statistics exist for people to know more about the youth, for example, adequate information has been released by the government, like the Census and population By-census conducted by the Census and Statistics Department. However, there is insufficient graphs showing the possible reasons of certain issues about the youth. If this web application can provide several selected topics that explain some trends that have been found about the youth in Hong Kong and their possible reasons, such as economic reason, it can broaden the horizon of the users.

Second, the project aims to inspire users to get to know more about our society. When we are young, we focus on studying. When we get older, we focus on working. When we get some spare time, we tend to hang out with friends and family or just stay home playing games. Therefore, we may overlook the things happening in our society. This is not limited to youth, but also people of different backgrounds, such as ethnicities and religious belief. With this project, it is hoped that users can raise their awareness on the society. With more understanding among citizens in Hong Kong, the society will become more harmonious.

Third, the project hopes to encourage users to discover how issues occur. In our daily life, there are many things happening around us and in different parts of the world. We know many issues happened, but we seldom figure out how and why did they happen. For instance, many students learn mathematical formulas by rote. It is correct that they can come up with these formulas when they are doing homework or tests, but they indeed do not know how to derive them. Another example is when we are cutting unions, tears always drop from our eyes, but very few of us know the reason behind. So, with this project, we hope that when users see something has happened, they will try to figure the reason that it has happened, instead of just noticing its happening. This can surely train their logical thinking.
Methodology

The frontend part of the project will be implemented by React, which is a library of JavaScript that is widely adopted for constructing user interfaces. The backend part of the project will be implemented by Node.js, which can receive the requests from the users and act by giving appropriate responses to them. The database will be implemented by MongoDB Atlas, which is the cloud version of this renowned non-relational database. For the data visualization part, D3.js, another JavaScript library will be adopted to turn data into visualized form [3].

Below are the brief introductions of the main features of the web application.

Search box

It is usual that even for people interested in a field to have their own favourite aspect of it. Therefore, a search box will be present on the page for users to type in some key words that they are most interested in. To facilitate the efficiency in searching, an auto-complete functionality will be implemented, so that whenever a user has typed in a letter, a filtering function will be performed and a list of topics that include the keyword typed will be shown, which can significantly improve the searching experience.

Topic related to Youth in Hong Kong

This is the main part of the web application. There will be plenty of articles, with each one focusing on a part of issues related to youth in Hong Kong.

For each topic, some graphs will be provided in order with paragraphs explaining the details. Also, there will be a simple quiz at the end of the article, which consists of several multiple choice questions and true or false questions designed for enhancing the understanding of that topic. After completing the quiz, they can view the answer of the quiz to consolidate their knowledge on that topic. Furthermore, there will also have a text box, which allows users to share their thoughts, suggestions or even complaints to us. If they want to receive a reply message in the future, they can fill in their email address in the contact field. Otherwise, they can choose to send the message anonymously. User comment is extremely important to us, as it can let us know how we can improve our future work from various aspects, such as layout and possible improvements on existing features.
**Bookmarking**

People have their own favourite articles and they may want to mark it for re-reading sometimes later. Also, when people read an article, they will have their own thoughts on it. Most people will just let these thoughts go, but there are also people that wants to jot them down somewhere. With this bookmarking feature, the two wishes can be fulfilled at once. If users come up with any opinions or ideas when they are reading a particular topic, they can just simply make use of the bookmarking feature, which they can type in their thoughts on it, so that next time they go back to this web application again, they will be able to know what they thought about that topic and when did they bookmark it. This feature requires users to log in before use.

**Enable users to make their own visualizations**

After users browse several visualizations in the articles, they may also want to create their own ones and find out the meaning of the graphs generated by them. This feature allows them to construct a new visualization, based on data provided by the web platform or data uploaded by them. They can customize the graph, like types, title and colour of the graph. With this feature, we hope to enhance the interest of users in data visualization.

**Schedule and Milestones**

<table>
<thead>
<tr>
<th>Date</th>
<th>Task</th>
</tr>
</thead>
</table>
| September 2020        | Get familiar with D3.js  
|                       | Prepare project plan  
|                       | Implement project website |
| 4 October 2020        | Submit project plan and deliver project website |
| 5 October 2020 – January 2021 | Design user interface  
|                       | Implement database  
|                       | Collect feedback on user interface  
|                       | Start working on the articles |
| 11-15 January 2021    | First Presentation |
| 24 January 2021       | Hand in interim report  
|                       | Preliminary implementation |
| January – April 2021  | Implement quiz part on the articles  
|                       | Implement feature to enable users to construct new graphs  
|                       | Collect feedback on new features  
|                       | Improve the platform according to the feedback  
|                       | Overall testing |
| 18 April 2021         | Submit final report  
|                       | Finalized tested implementation |
| 19-23 April 2021      | Final Presentation |
Reference

