**COMP7507 Visualization and Visual Analytics**

**Project Report**

**Visual Analysis on the Covid-19 Pandemic**

**Recovery of Hong Kong**

Group 7

Yi Heng 3036195382

Zhong Hao 3036196984

Wang Yilin 3036197354

Zhou Xingjian 3036195148

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# ﻿Objectives

COVID-19 pandemic has impacted diverse aspects in the Hong Kong society since 2019. Whether this city has recovered to its pre-pandemic status is unobvious and difficult to observe. The concept of recovery is abstract, thus more concrete evaluations are needed.

Inspired by Loh et al., this report measures the recovery vitality of Hong Kong by three key indicators: **1)** **office price, rent and vacancy rates, 2) public transportation ridership, and 3) retail ﻿sales.** The outcome of our work is a package of data visualization workbooks with necessary interactions and analysis on these materials.

# ﻿Highlights of Work

1. ﻿price, rent and vacancy rates,
2. public transportation ridership, and
3. retail ﻿sales

# Datasets and Visualization Tool

In this part, we will briefly describe the composition of our datasets, giving an overview of the data structure of the three indicators above. Also, we will discuss the visualization tool and methodology we chose.

## Datasets

1. Office data

Office buildings are the most common location for work and thus can reflect the health of economy. There are various data related to office, among which we care the most are as follows:

* Rent (/m2 per month)
* Price (/m2)
* Vacancy rate

The data above relies on seven regions of Hong Kong where the office buildings are centralized. We keep this feature in case there are potential discrepancy among different regions.

1. Transportation

(Overview. Can follow the above for reference. Details can be given in the later part)

1. Retail Sales

(Overview. Can follow the above for reference. Details can be given in the later part)

## Visualization Tool

1. Tableau

Initially, we considered Plotly to proceed our work. However, we find it hard to merge our contributions together. In that case, we finally chose Tableau Cloud to conduct our visualization project because it can be easily used for collaborative development.

The Tableau is also good at displaying data on a map – in this case the map of Hong Kong. Although Tableau only provides geographic roles limited to province-level, we can reduce the granularity by importing Hong Kong’s space file. Tableau is also good enough for realize user interaction with simple operations on the workbook.

1. Web…?

We found that Tableau is good at designing each single dashboard. However, it lacks the ability to combine all our works together. The navigation object in Tableau dashboard cannot show the sub-structure of each part, so that we used webpages for a more flexible design.

As we have mentioned, web application distinguished from its unique flexible design ability, but it exists its own drawbacks for:

* Not simple enough for quick design one single visual dashboard.
* Need server to run applications.

These drawbacks may carry unexpected burdens except pure visual applications. To overcome such shortcomings, we simply use *layui* as our UI framework and Go-live extension in vscode for a quick server build.

# Office: vacancy, rent and beyond

## Data Details

## Design

## Visualization

## Analysis

## Limitations and diffculites

* *Effectiveness of the* *visualizations (e.g., how you use them to develop hypotheses and understand/analyse data/problems)*
* *Different methods that you have tried and justification of your choices*
* *Difficulties that you have encountered, if any*
* *Anything you wanted to do but haven’t? Why?*
* *Any limitations to your visualizations and/or the tools that you used?*

# Transportation

(Suggestion: develop this part from 4 subtitles: 1) detailed data structure (the columns), 2) design and how you came up with the design (with text), 3) final outcomes (basically your tableau work, just put some images here and briefly describe them) and 4) analysis)

## Data Details

## Design

## Visualization

## Analysis

## Limitations and diffculites

* *Effectiveness of the visualizations (e.g., how you use them to develop hypotheses and understand/analyse data/problems)*
* *Different methods that you have tried and justification of your choices*
* *Difficulties that you have encountered, if any*
* *Anything you wanted to do but haven’t? Why?*
* *Any limitations to your visualizations and/or the tools that you used?*

# Retail Sales

(Suggestion: develop this part from 4 subtitles: 1) detailed data structure (the columns), 2) design and how you came up with the design, 3) final outcomes (basically your tableau work, just put some images here and briefly describe them) and 4) analysis)

## Data Details

## Design

## Visualization

## Analysis

## Limitations and diffculites

* *Effectiveness of the visualizations (e.g., how you use them to develop hypotheses and understand/analyse data/problems)*
* *Different methods that you have tried and justification of your choices*
* *Difficulties that you have encountered, if any*
* *Anything you wanted to do but haven’t? Why?*
* *Any limitations to your visualizations and/or the tools that you used?*

# Conclusion

In general, our conclusion is that Hong Kong has started to recover from the COVID-19, but still not reached the base line before the plague yet. For the aspect of vacancy, this indicator of those office buildings graded in “A” and “B” are increasing while the rate of buildings graded in “C” is decreasing during the COVID-19 period. This is probably because people may not afford the cost of those more advanced, expensive, and highly equipped buildings and tend to choose those building graded in “C”. In the transportation’s perspective, due to the traffic control policy, the inter transportation for Hong Kong nearly falls to one in a thousand compared to data of the pre-pandemic period. Even we counted the data after COVID-19, the picture still shows a weak view compared to the pre-pandemic data. But it is a good signal that the data recovered in a rapid way, which may infer that the economy of Hong Kong has gained its motivation. As for retail sales, we set the total retail sales by month in 2019 as base line, and surprisingly found that even the data are below in the most of time during COVID-19, the data after August in 2023 are all above the base line. All these clues lead to our conclusion.

For the further work, we took three aspects for our project, it is obvious that there are extra indicators which are also suitable for evaluating the economy in Hong Kong. What is more, due to the time after Hong Kong government cancel the control policy is no more than 10 months, which may not be sufficient for our conclusion, and further work and data are necessary.

# Contribution & Work Plan

Overview of tasks completed by each of the team members (details of tasks should go to the individual reports from members)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Oct**  **8-15** | **Oct**  **16-23** | **Oct**  **24-31** | **Nov**  **1-8** | **Nov**  **9-16** | **Nov**  **17-24** | **Nov**  **25-30** |
| Data Preparation | X | X |  |  |  |  |  |
| Analysis of Office Vacancy Rates |  | X | X | X |  |  |  |
| Analysis of Public Transportation Ridership |  | X | X | X |  |  |  |
| Analysis of Retail Sales |  | X | X | X |  |  |  |
| Find out associations between the recovery rate and various factors |  |  | X | X | X |  |  |
| Finalize the demo |  |  |  |  | X | X |  |
| Finish the report |  |  |  |  | X | X | X |

# Reference