WEB APPLICATION USER GUIDE

IS428 - VISUAL ANALYTICS FOR BUSINESS

INTELLIGENCE

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This document details the steps to use the web visualization application

TABLE OF CONTENTS

INTRODUCTION

Real Estate investment has always been a relatively safe choice of investment for people seeking to gain decent returns. Many people dream of retiring early and earning a good passive rental income through their invested property. However, real estate investment is more complicated than most other investment vehicles. This has led to the development of various analytical tools globally to help analysts and investors to gain better insights of the property market, including Singapore.

All existing map visualisations of the property market in Singapore use a choropleth map which has certain limitations for property market analysis. As such, we intend to fill this gap in the market by developing a more effective map visualisation of the private property market through the use of an interactive **hexagon binning map**.

Through our visualisation, we hope to provide analysts and investors with valuable insights of the private property market which could not be discovered using existing map visualisation tools in the market. This application mainly serves as an exploratory platform and will therefore require qualitative research such as news reports of recent developments to understand the reason for certain patterns.

Through our application, analysts will be able to:

> 1. Identify projects that are driving the sales in a region

> 2. Explore time series price and transaction trend of the market to identify the market outlook

> 3. Explore pricing patterns across different region and different projects

> 4. Explore possible reasons for the trend in price and sales volume based on location

SET-UP OF THE APPLICATION

To run the web application, you will need the following installed on your machine:

- A web browser (recommended: Google Chrome)
- Local Server (recommended: WAMP Server, EasyPHP v14.1)

1. Unzip and place the folder (Restates_Vizards) into the "www" folder where WAMP is installed (usually in the following directory: C:/wamp64/www). If you are using EasyPHP, place the folder into "localweb" folder (usually in the following directory: C:\Program Files (x86)\EasyPHP-DevServer-14.1VC9\data\localweb).

2. Run the local server based on where you have placed the folder.

3. Open the web browser and navigate to the following URL:

   http://localhost/REstateVizards/

4. For the best experience, please adjust your screen resolution to **1366 x 768** and note that this application is best viewed on **Google Chrome browser**. All **ad-blockers should be disabled** for the application to work. Upon opening the web application, please wait for a few seconds to load the data as there are more than 100,000 rows to be loaded.

INTRODUCTION OF KEY FEATURES

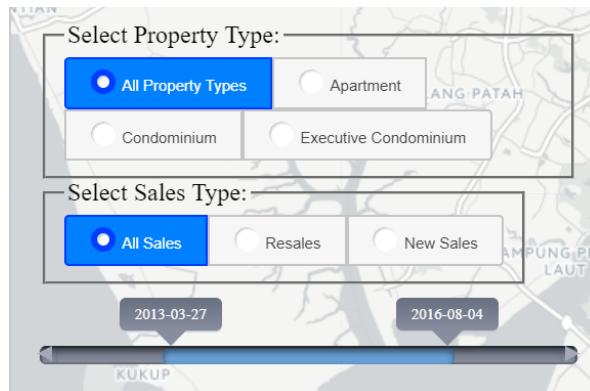## Overview of the Application
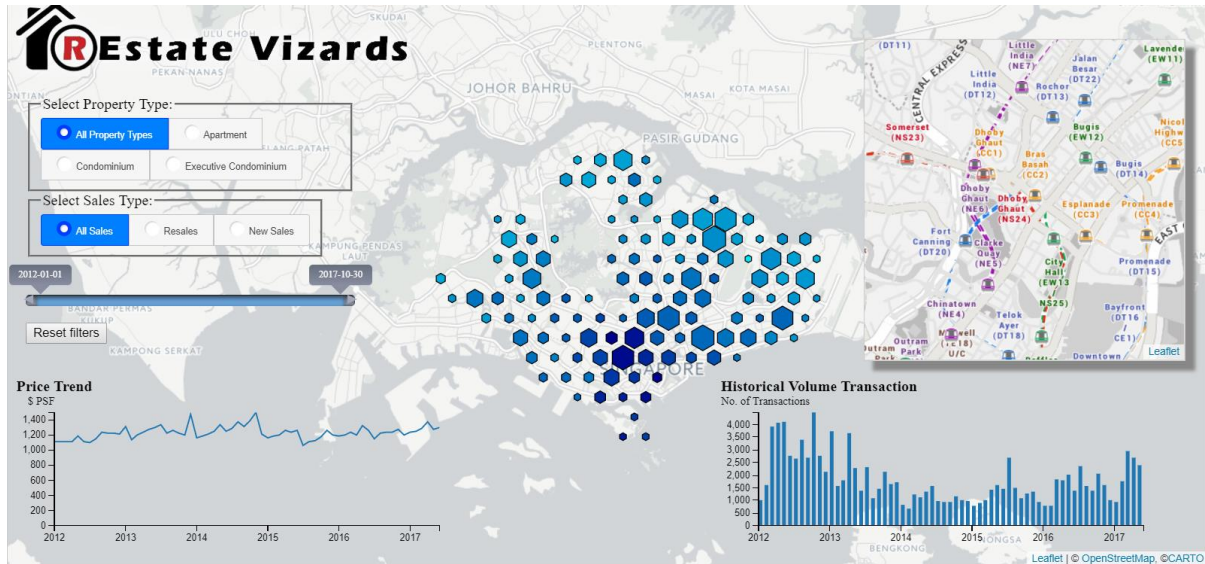
1. Filter Elements

Figure 1: Filter elements

The filter elements (Figure 1) allows analysts to filter the dataset according to their selection. Analysts can choose to view by property types such as apartment, condominium and executive condominium. Also, analysts can also filter by sales type such as resales and new sales. Finally, analysts can filter by date by selecting the date range using the date slicer.

All these elements can work together concurrently. For example, analysts can choose apartment and new sales between year 2014 to 2015.
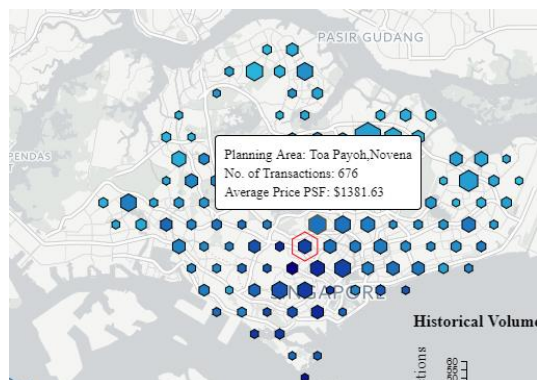
2. Overview Map

Figure 2: Main map

The main map (Figure 2) shows the transactions of private properties across Singapore based on the filter elements in Figure 1. The size of each hexagon bin is proportional to the number of transactions in that area and the colour intensity is proportional to the average price per square foot (psf). When analysts select a hexagon bin, the Detailed Map, Price Trend Chart and Historical Volume Chart will change to show transactions from the selected bin only. Analysts can also mouse over each bin to see the planning area, number of transactions and average price PSF.
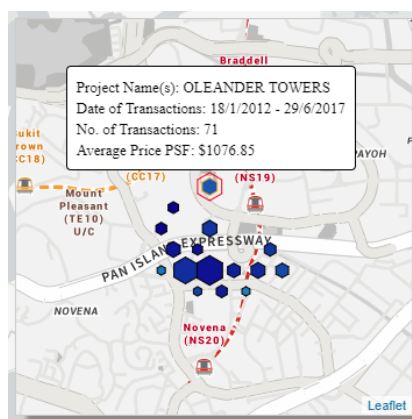
3. Detailed Map

Figure 3: Detailed Map

The Detailed Map (Figure 3) shows the transactions of private properties in the selected hexagon bin based on the Overview Map in Figure 2. The size of each hexagon bin is proportional to the number of transactions in that area and the colour intensity is proportional to the average psf. When analysts select a hexagon bin in the Detailed Map, , Price Trend Chart and Historical Volume Chart will change to show transactions from the selected bin only. The main purpose of this details map is allowing analysts to see all the projects in the bin and identify which projects are the driving factors to high/low price and volume. They can also mouse over each bin to see the project name, date range of transactions, number of transactions and average price PSF.
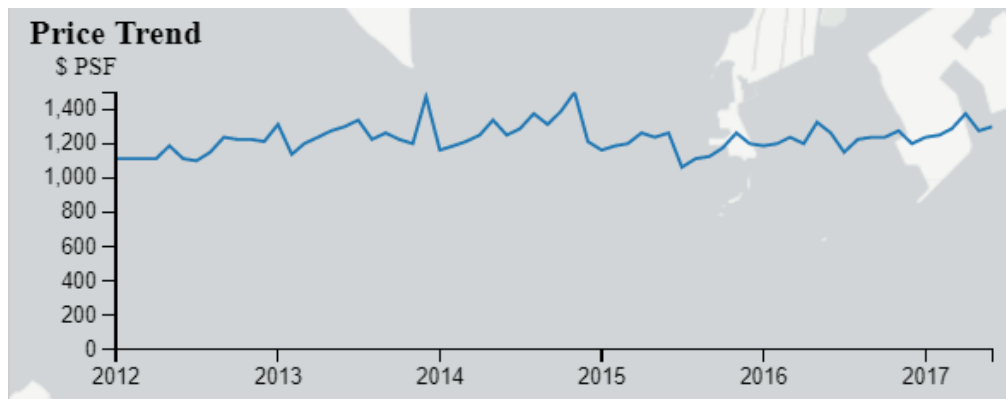
4. Price Trend Chart

Figure 4: Price Trend Chart

The price trend chart (Figure 4) shows the time-series average psf for the dataset or the selected hexagon bin over the past 5 years. Analysts can use the filter elements to see the price trend for various property and sales type as well as selected bin. The main purpose of this chart is to allow analysts to find patterns in the price upon configuring the filters and selecting bin.
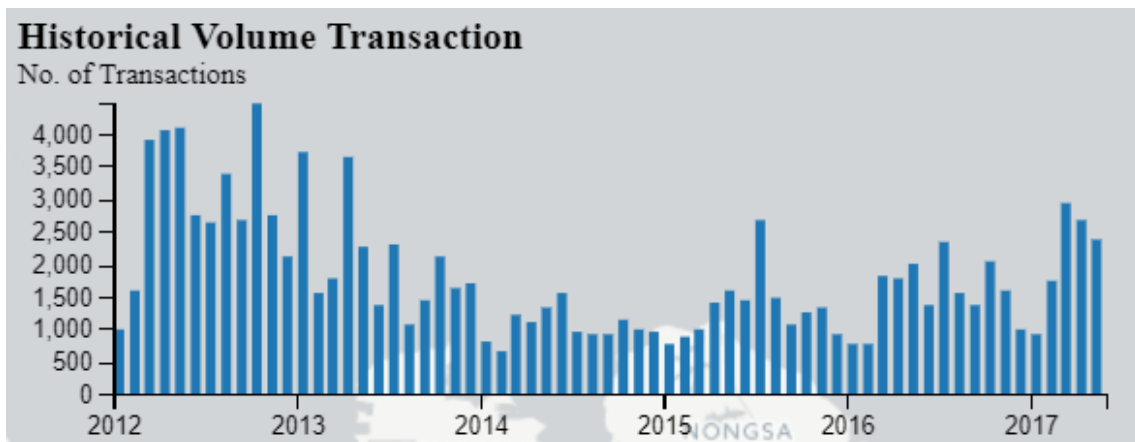
5. Historical Volume Chart

Figure 5: Historical Volume Chart

The historical volume chart (Figure 5) shows the number of transactions for the dataset or selected bin over the past 5 years. Analysts can filter to see the historical volume for various property and sales type as well as selected bin. The main focus for this chart is to allow analysts to find trend in volume upon configuring the filters and selecting bin.

STEP-BY-STEP FLOW

The following provides a step-by-step guide for analysts to use the web application. Analysts need to note that they do not need to strictly follow this process to achieve their objectives. This guide is recommended for analysts who are new to using the visualization tool.

Step 1:

Choose the property and sales type you wish to analyse in Singapore's non-landed private property market. Then, choose the date range you wish to view. The other charts will update to reflect the changes.
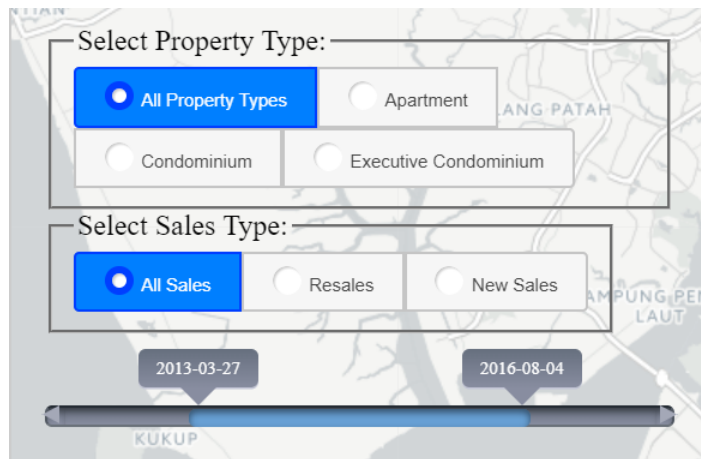

Figure 6

Step 2:

Refer to the Overview Map and look for interesting patterns. Click on any area of interest in the Overview Map to explore further. If you are unsure how to start the analysis, feel free to mouse over the various areas to decide which hexagon bin you wish to analyse. Alternatively, you can just analyse this map to detect big picture patterns of the entire market.
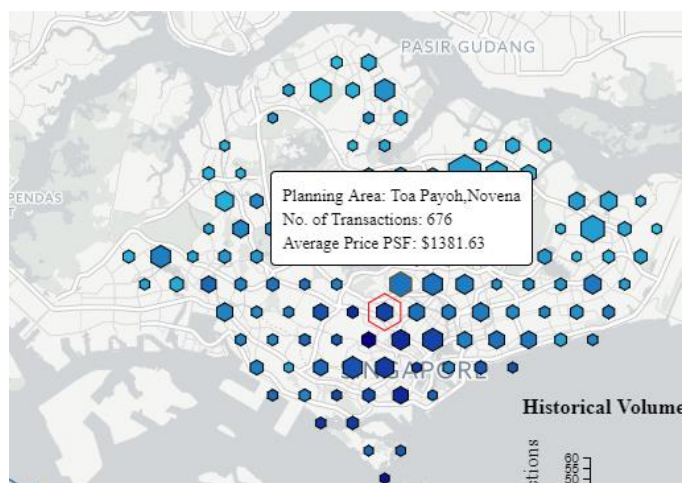

Figure 7

Step 3:

After clicking on a hexagon in the Overview Map from step 2, the Detailed Map will update to show the details of the selected hexagon. In the Detailed Map, you will be able to see all the projects and transactions that took place in the selected hexagon bin. From here, you can explore the projects that captures your attention. Next, click on the hexagons
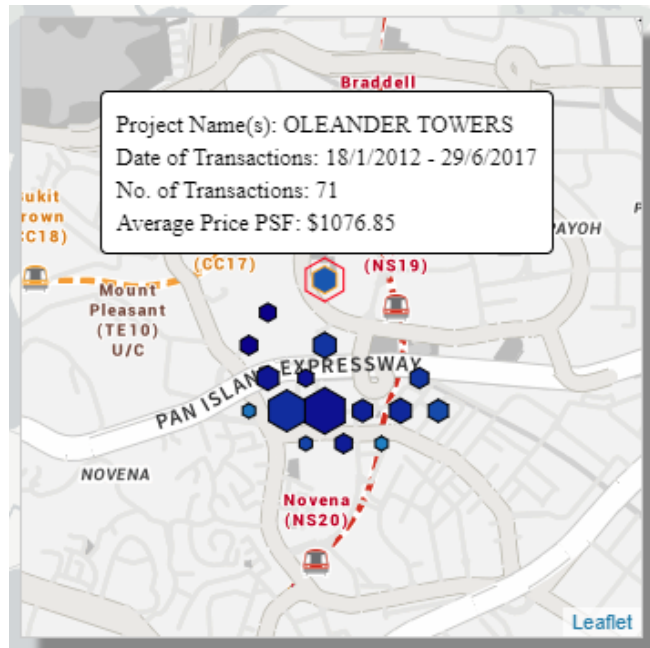

Figure 8

Step 4:

Next, proceed to to the Price Trend chart to analyse the time series price trend of the selected hexagon bin. In this example, the price has been quite volatile for the past 5 years.
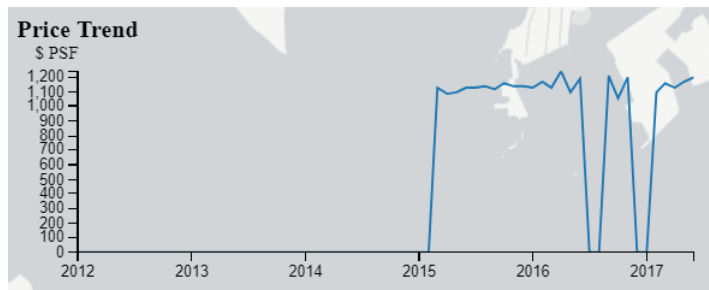

Figure 9

Step 5:

Finally, proceed to the Historical Volume Chart to see the number of transactions in the selected bin. In this example, the number of transactions have been slowing down since mid-2013. Sales volume has remained at a low level until 2017 when the market seems to start picking up.
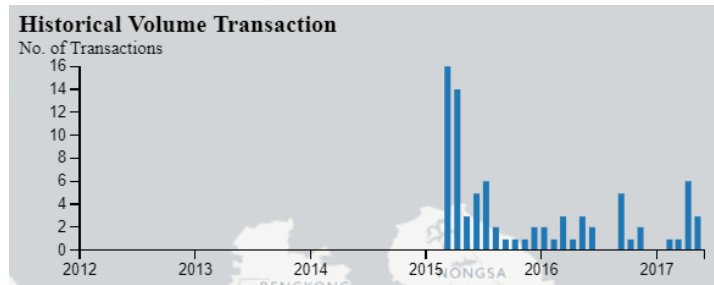

Figure 10

Step 6:

Repeat steps 1 – 5 to explore and analyse further patterns in the property market.

TIPS

- Make use of the filter elements. It is always better to look at an individual property / sales type than aggregating these types together as it can result in an incorrect analysis.
- The Detailed Map is your friend. Do not just simply look at the size and colour of the bin on main map and draw conclusion. Sometimes, there are outliers in the selected bin that may skew the price and number of transactions. Look at the details map to analyse.
- Decreasing in price in the price trend chart does not mean losing popularity. It may mean the private property market is generally not doing well in the past few years for Singapore. You should always look at other bins to determine this fact.
- Likewise, decreasing volume in historical volume chart does not mean losing popularity. One reason may be the properties there are built many years ago and there are no new sales, which means there will be lower number of transactions.

POINT OF CONTACT

For informational or troubleshooting purposes, please do not hesitate to contact any of the developers:

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